RESOLUTION NO. 2024-

A RESOLUTION OF THE VILLAGE OF PINECREST, FLORIDA, ACCEPTING THE BCC ENGINEERING FINAL VULNERABILITY ASSESSMENT (VA) REPORT; PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Federal and State grant funding sources now require all grant applicants have a Vulnerability Assessment Study to apply for funding; and

WHEREAS, on July 11, 2022, the Village Council adopted Resolution No. 2022-42, authorizing BCC Engineering to complete the Vulnerability Assessment Study; and

BE IT RESOLVED BY THE VILLAGE COUNCIL OF PINECREST, FLORIDA, AS FOLLOWS:

Section 1. That the Village Council hereby accepts the BCC Engineering Vulnerability Assessment (VA) Report dated June 2024, which identifies areas within the Village most susceptible to damage from an increase in sea-level and groundwater rise.

Section 2. This resolution shall take effect immediately upon adoption.

PASSED AND ADOPTED this 11th day of June, 2024.

_____
Joseph M. Corradino, Mayor

Attest:

_____
Priscilla Torres, MMC
Village Clerk

Approved as to Form and Legal Sufficiency:

_____
Mitchell Bierman
Village Attorney

Consent Agenda

THIS PAGE INTENTIONALLY BLANK

VILLAGE OF PINECREST
VULNERABILITY ASSESSMENT

Final Vulnerability Assessment (VA) Report_DRAFT

June 2024

Prepared For:

PINECREST
12645 Pinecrest Parkway,
Pinecrest, Florida 33156

Prepared By:

bcc engineering
6401 SW 87th Avenue, Suite 200
Miami, FL 33173

Table of Contents

List of Figures

List of Tables

List of Appendices

1.0 Executive Summary

1.1 Background

The Village of Pinecrest (Village) is a suburban community located 11 miles (18 km) southwest of downtown Miami. The Village is located in southeast Miami-Dade County near Biscayne Bay, Florida (**Figure 1-1**). The Village was incorporated in 1996 and is bordered by Coral Gables to the east, South Miami to the north, Glenvar Heights to the northwest, Kendall to the west, and Palmetto Bay to the south.

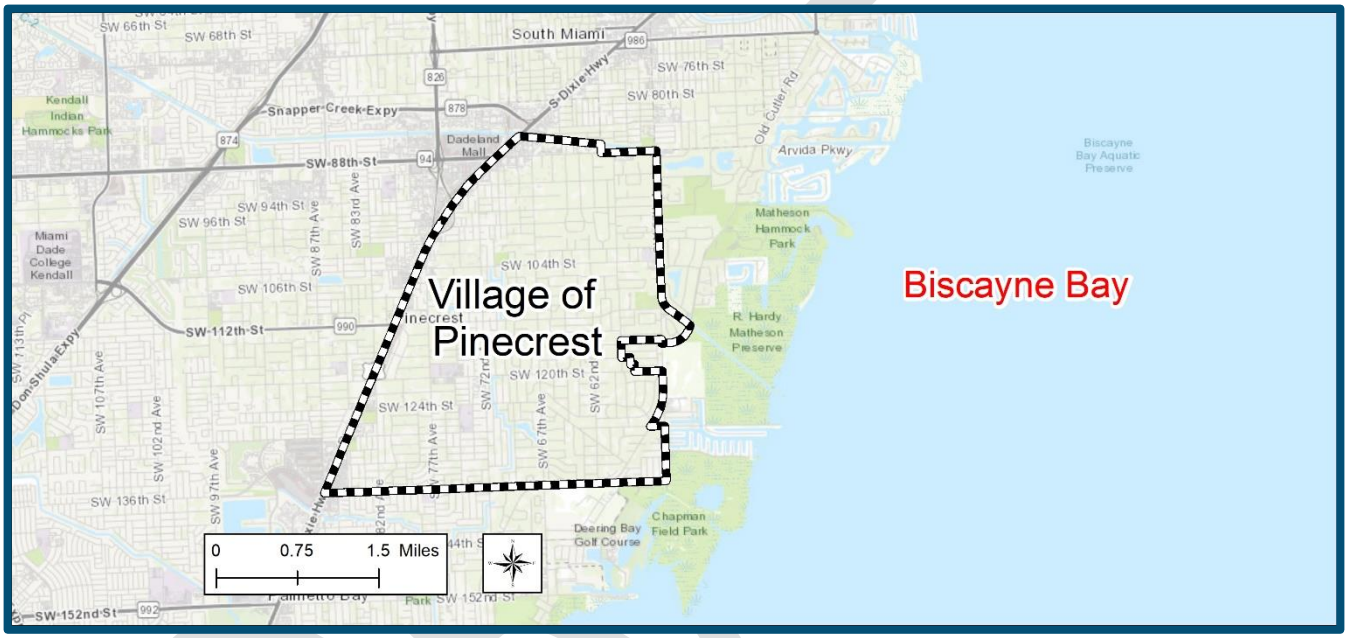


Figure 1-1. Project Location

1.2 Acquire Background Data

1.3 Project Coordination, Public Outreach Meetings, and Stakeholder Engagement

1.4 Exposure Analysis

1.5 Sensitivity Analysis

1.6 Identification of Focus Areas

2.0 Introduction

2.1 Background

The Village of Pinecrest (Village) is a suburban community located 11 miles (18 km) southwest of downtown Miami. The Village is located in southeast Miami-Dade County near Biscayne Bay, Florida (**Fi**). The Village was incorporated in 1996 and is bordered by Coral Gables to the east, South Miami to the north, Glenvar Heights to the northwest, Kendall to the west, and Palmetto Bay to the south.

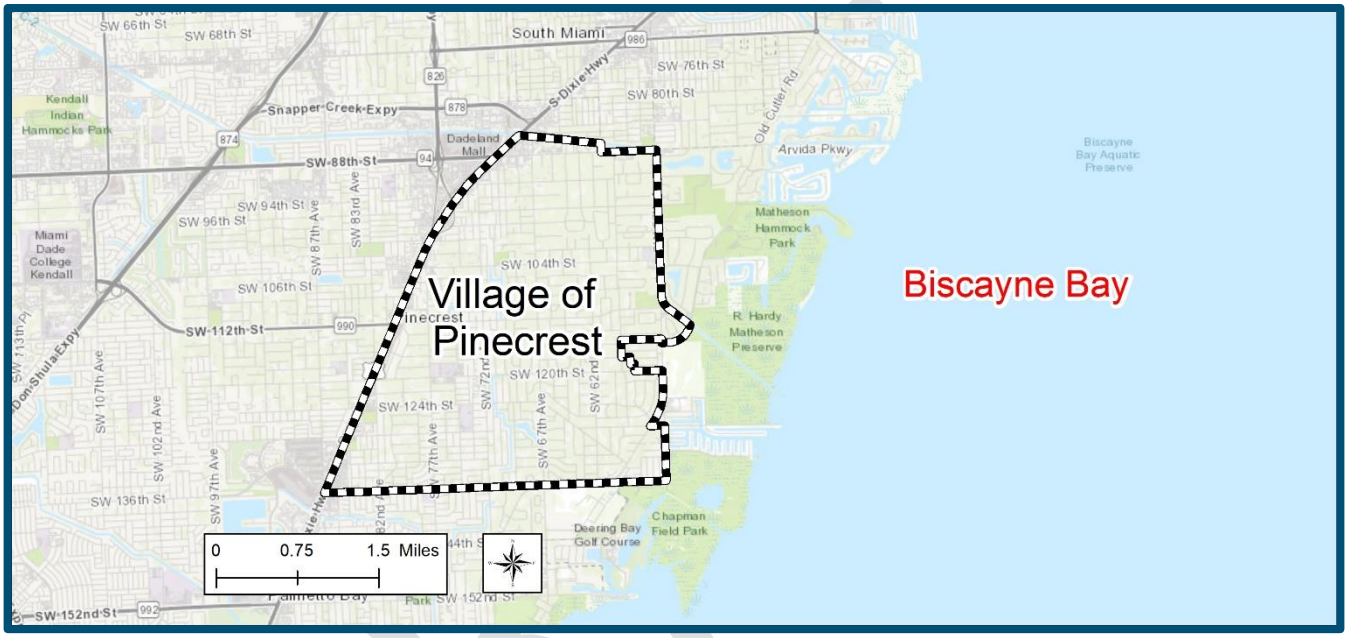


Figure 2-1. Project Location

The Village has a population of approximately 18,300 residents, based on the 2020 census, and encompasses an area of 7.52 square miles (+/- 4,817 acres). Due to its proximity to Biscayne Bay, it is vulnerable to changing climate conditions, including rising sea levels, rising groundwater, increased rainfall amounts, and threats from stronger hurricanes and accentuated storm surges.

2.2 Purpose and Scope

As part of the 2021 regular session, the Florida Legislature recognized that the state is particularly vulnerable to adverse impacts from flooding resulting in part from the increased frequency and duration of rainfall events, storm surges from more frequent severe weather systems, and sea level/groundwater rise. The Legislature further recognized that Vulnerability Assessments (VAs) are necessary to comprehensively determine the specific risks posed to the state by flooding and sea-level/groundwater rise and to develop a statewide coordinated approach to addressing such risks.

To facilitate these assessments, the Florida Department of Environmental Protection (FDEP) has established the Resilient Florida (RF) Grant Program. This initiative authorizes the FDEP to provide grants to local governments to fund the costs of community resilience planning and to set forth requirements for certain local government vulnerability assessments.

Understanding that the Village is susceptible to anticipated adverse climate and weather impacts, an initial step was taken in 2015 with the completion of a Stormwater Master Plan (SWMP). This SWMP has served as a comprehensive planning-level engineering document. Its purpose was to analyze the Village's existing stormwater management systems, pinpoint high-priority flood-prone areas, and formulate cost-effective conceptual designs for projects to mitigate the flooding issues.

As part of the RF Grant Program, the Village applied for funding to examine the impacts of flooding on all critical assets within its jurisdiction. The Village has retained BCC Engineering, LLC (BCC) through a contracted Continuing Professional Engineering Services Agreement (Agreement Number: 22PLN63) to develop a comprehensive VA. The intent of the VA includes analyzing the impacts of sea-level rise, groundwater rise, and increased rainfall amounts on all regionally significant assets in accordance with the requirements set forth in s. 380.093 F.S. within the Village limits. The assessment utilizes the most recent publicly available data along with any available hydrologic and hydraulic (H&H) models as part of the SWMP report.

The scope of work for this project was subdivided into eight (8) tasks, with the final tasks consisting of preparing the draft and final version of the VA report. A summary of the tasks is provided below:

- **Task 1 – Acquire Background Data**
    - *Request and collect readily available data from the Village and various other governmental agencies/entities to support the vulnerability assessment.*
    - *Identify data gaps in accordance with the vulnerability assessment requirements outlined in s. 380.093, F.S., which includes gathering the data required to fill those gaps.*
    - *Develop a data catalog for all collected information.*
    - *Includes preparing and/or updating the inventory of critical and regionally significant assets based on the findings of the gap analysis and coordinating stakeholder engagement.*
    - *Review critical facilities and create and/or update asset inventories in accordance with F.S. 380.093.*
    - *Prepare applicable Geographic Information Systems (GIS) shapefiles in accordance with the GIS Data and Metadata standards for Resilient Florida Planning Grants.*
- **Task 2 – Kick Off Meeting (Coordination Meeting)**
    - *Includes meeting to develop an overall project management plan and address initial actions after notice-to-proceed.*

- *Meeting will focus on discussing project scope, goals, schedule, key milestones, and deliverables for a consistent approach.*
- *The grantee hosts a kick-off meeting to identify potential representatives for the project steering committee.*
- *Prepare a sign-in sheet, draft project schedule, and other necessary meeting materials.*
- *The grantee recommends limiting the project steering committee to no more than 10 representatives for better meeting outcome management.*

- **Task 3 – Exposure Analysis**
  - *Includes model developments as part of the Stormwater Master Plan (SWMP) completed in 2015 to perform an exposure analysis in accordance with guidelines set forth in s. 380.093, F.S.*
  - *Conduct an exposure analysis to determine the depth of water caused by rainfall and tidal induced flooding for four (4) design storm events using different sea-level/groundwater rise scenarios.*
  - *Mapping the spatial extent of flooding throughout the Village using the scenarios and standards outlined in s. 380.093, F.S. Two (2) planning horizons will be evaluated in the years 2040 and 2070 using both the 2017 NOAA intermediate-low and intermediate-high sea-level rise projection curves.*
  - *Prepare applicable GIS shapefiles and depth of flooding maps in accordance with the GIS Data and Metadata standards for the Resilient Florida Planning Grants.*
- **Task 4 – Sensitivity Analysis**
  - *Includes performance of a sensitivity analysis in accordance with the guidelines outlined in F.S. 380.093.*
  - *Evaluate the impact of flooding on assets by applying the data/results from the exposure analysis to the critical asset inventory created in Task 3.*
  - *Prepare applicable GIS shapefiles in accordance with the GIS Data and Metadata standards for Resilient Florida Planning Grants.*
- **Task 5 – Identify Focus Areas**
  - *Includes identifying focus areas of significant flooding based on the results of the second public outreach meeting, exposure analysis, and sensitivity analysis following Chapter 2 of the Florida Adaptation Planning Guideline.*
- **Task 6 – Final Vulnerability Assessment (VA) Report, Maps, and Tables**
  - *Includes compiling the Technical Memorandums outlined in Tasks 1 through 5 into a single complete draft of the Vulnerability Assessment Report in accordance with the guidelines outlined in s. 380.093, F.S.*

The results and findings of critical tasks will be summarized into six (6) task-specific Technical Memorandums (TM). The TMs to be prepared as part of this VA are as follows:

- **TM No. 1:** *Acquire Background Data*

- **TM No. 2:** *Kick of Meeting*
- **TM No. 3:** *Exposure Analysis*
- **TM No. 4:** *Sensitivity Analysis*
- **TM No. 5:** *Identify Focus Areas*
- **TM No. 6:** *Final Vulnerability Assessment (VA) Report, Maps, and Tables*

3.0 Data Collection

3.1 Background

The first task of the VA was to collect, organize, and review all information relevant to the study area and project scope. More specifically, BCC researched and compiled the applicable data that is needed to perform the VA, based on the requirements set forth in s. 380.093, F.S. Accordingly, three (3) main categories of data were collected, which consisted of the following:

1) Critical and regionally significant assets
2) Topographic data
3) Flood scenario-related data

The information that was collected included, but was not limited to, GIS data, H&H model files, record drawings/as-builts, permitting information, private/public utility data, prior engineering evaluations, and documentation of flooding conditions (i.e., photos, videos, etc.). This data was collected from various entities having jurisdiction over the project area or maintaining data within and around the Village's limits. A catalog of all the available data collected is summarized in **Appendix A**. The following sub-sections provide additional details on the three (3) main data categories that are needed to successfully complete the VA.

3.1.1 Critical and Regionally Significant Assets

The critical and regionally significant assets include four (4) categories, which consist of:

- Transportation assets & evacuation routes
- Critical community & emergency facilities
- Critical infrastructures
- Natural, cultural, & historical assets

The above asset types are described in more detail below. It should be noted that not all asset types are applicable within the Village's limits.

I. Transportation assets and evacuation Routes, including airports, bridges, bus terminals, ports, major roadways, marinas, rail facilities, and railroad bridges.

II. Critical infrastructure, including wastewater treatment facilities, wastewater lift stations, stormwater treatment facilities, stormwater treatment pump stations, drinking water facilities, solid and hazardous waste facilities, military installations, communications facilities, and disaster debris management sites.

III. Critical community and emergency facilities, including schools, colleges, universities, community centers, correctional facilities, disaster recovery centers, emergency medical service facilities, emergency operation centers, fire stations, health care facilities, hospitals, law enforcement facilities,

local government facilities, logistical staging areas, affordable public housing, risk shelter inventory, and state government facilities.

IV. Natural, cultural, and historical resources, including conservation lands, parks, shorelines, surface waters, wetlands, and historical and cultural assets.

3.1.2 Topographical Data

The topographical information includes two (2) data categories, which consists of the following:

- Survey data
- LiDAR, digital elevation model (DEM) data

The above data types are described in more detail below. It should be noted that not all data types are applicable within the Village's limits.

I. Survey data, includes information that can be sourced from Florida Division of Emergency Management (FDEM) Florida Elevation Certificates, locally sourced county and municipality data of Finished First Floor Elevations (FFEs), and roadway crests for selected critical assets.

II. LiDAR, digital elevation model (DEM) data includes elevation information that can be sourced from the Miami-Dade County.

3.1.3 Flood Scenario-Related Data

The flood scenario-related data categories are provided below, along with their descriptions. It is again noted that not all data types shown will be applicable to the H&H modeling effort for this project.

I. Precipitation data, includes rainfall information for various design storm events that can be sourced from NOAA's Atlas 14, local water management districts (WMD), United States Geological Survey (USGS), and Florida Flood Hub. It is noted that both USGS and Florida International University (FIU) are in the process of developing or already have developed change factor values that can be applied to NOAA Atlas 14 distribution curves to account for future climate variability in south and central Florida.

II. Groundwater level data, includes groundwater information that can be sourced from the Miami-Dade County as boundary conditions in C-1 and C-100. In addition, potentiometric surface maps can be accessed from online sources made available by USGS along with the local WMD.

III. Sea-level rise (SLR) projections, include NOAA's most recent intermediate-low and intermediate-high SLR projections for 2040 and 2070. This can be accessed directly from NOAA or using the USACE's sea-level change curve calculator.

IV. Tidal datums and tidal flooding, include tidal data that can be sourced from NOAA's tides and currents website, as well as NOAA's digital coast SLR viewer and Florida Flood Hub.

V. Storm surges include flood depth grids and water surface elevation grids that can be obtained from the Federal Emergency Management Agency (FEMA). Additional sources include the National Hurricane Center's (NHC) Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model and the USACE Coastal Hazards System South Atlantic Coastal Study (SACS).

VI. River channel cross-section, includes data for river and/or stream cross-sections consisting of top of bank (TOB) elevations, overbanks, and seasonal high-water stages.

VII. Land use data, includes data on pervious/impervious areas based on land use/land cover classifications. This data is generally maintained by local WMDs, counties, and municipalities. Of important note is the collecting of future land use changes, which directly affects in increases or decreases in runoff volumes. Future land use can be obtained through the University of Florida (UF) GeoPlan Center, which has collaborated with the Florida Department of Transportation (FDOT) to produce future land cover data for the entire state. Moreover, municipalities generally have future land use information for areas within their jurisdiction to facilitate respective master planning efforts.

VIII. Evapotranspiration data, includes information on evapotranspiration (ET) losses, which influence antecedent soil moisture content preceding a rain event. This is of particular importance for continuous simulations and can significantly influence flood peaks. However, for shorter-duration design storm events, ET losses are typically not as critical.

3.2 Data Sources

Data was requested and/or obtained from the municipal, county, state, and federal agencies, which are listed below:

- Village of Pinecrest (Village)
- Miami-Dade County (County)
- Florida Department of Environmental Protection (FDEP)
- Florida Department of Transportation (FDOT)
- South Florida Water Management District (SFWMD)
- Southeast Florida Regional Climate Change Compact (SFRCCC)
- National Oceanic and Atmospheric Administration (NOAA)

- United States Geological Survey (USGS)
- United States Army Corps of Engineers (USACE)
- Natural Resources Conservation Service (NRCS)
- Federal Emergency Management Agency (FEMA)

The following sub-sections provide additional information on the data received from municipal, county, state, and federal agencies.

3.2.1 Municipal (Village) Data

The Village provided several GIS shapefiles, some of which were also available from the County's GIS Open Data portal. The specific data obtained from the Village is provided below. A more comprehensive list with additional details is provided in **Appendix A**. It must be noted that some data, such as airports, ports, marinas, and shorelines, are not applicable as there is no such asset type within the Village limits. Please see **Appendix A** for more information.

- Roads
- Community Center
- Fire & Rescue Station
- Library
- Land use
- Village Boundary
- Village Hall
- Police Stations
- Public Work
- Park Boundaries
- Stormwater Atlas

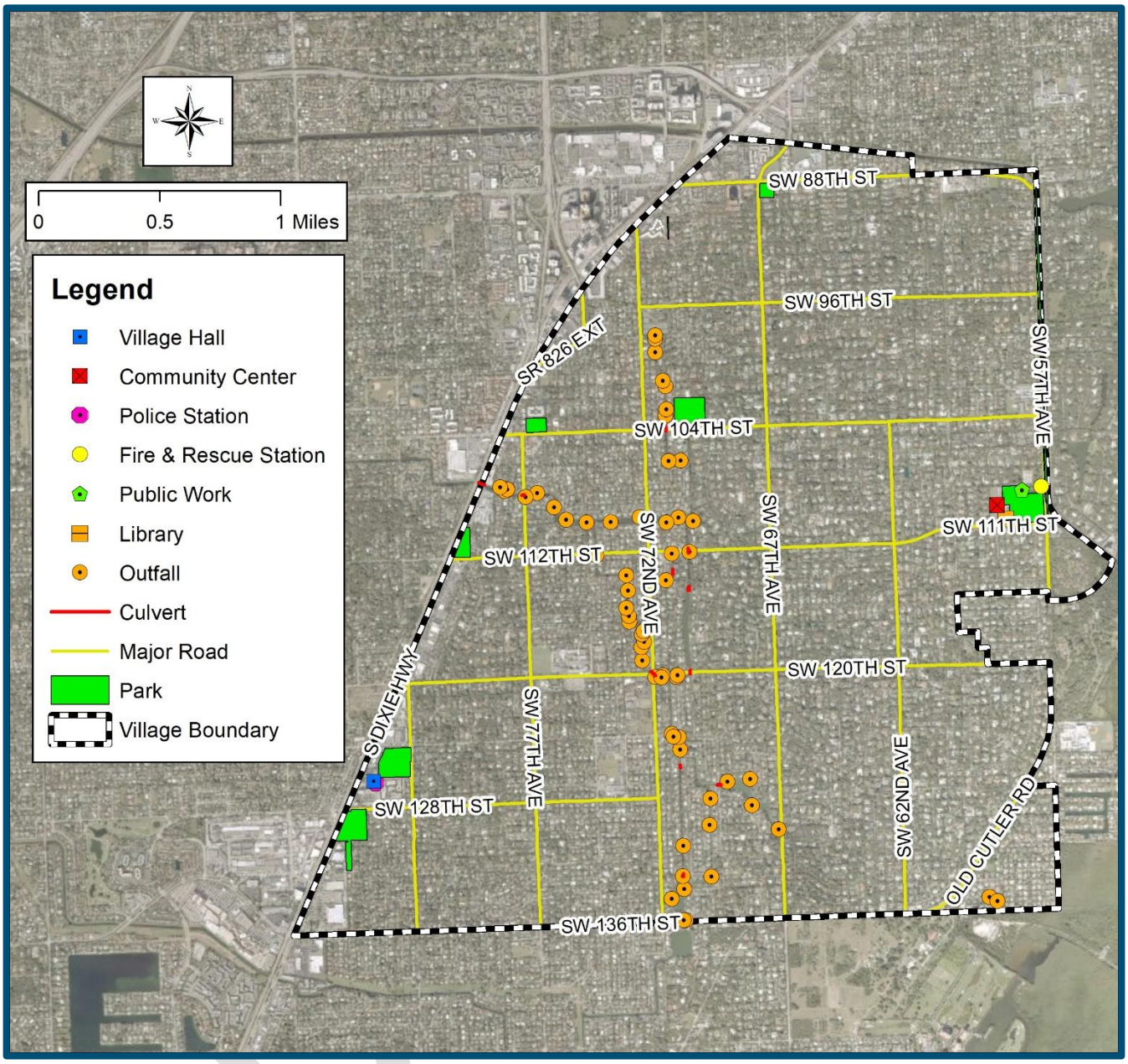


Figure 3-1. Collected Village Data

3.2.2 County Data

The Miami-Dade County has furnished stage data from four locations within the project area. This data will be utilized as a reference for establishing the boundary conditions for the model, taking into consideration various sea-level rise scenarios under investigation. The four designated nodes are:

- C100A_S120-D
- C100A_B23-N
- C2-N-SC-LG

- C2-B54-N

The locations of these nodes are illustrated in in **Figure 3-2**.

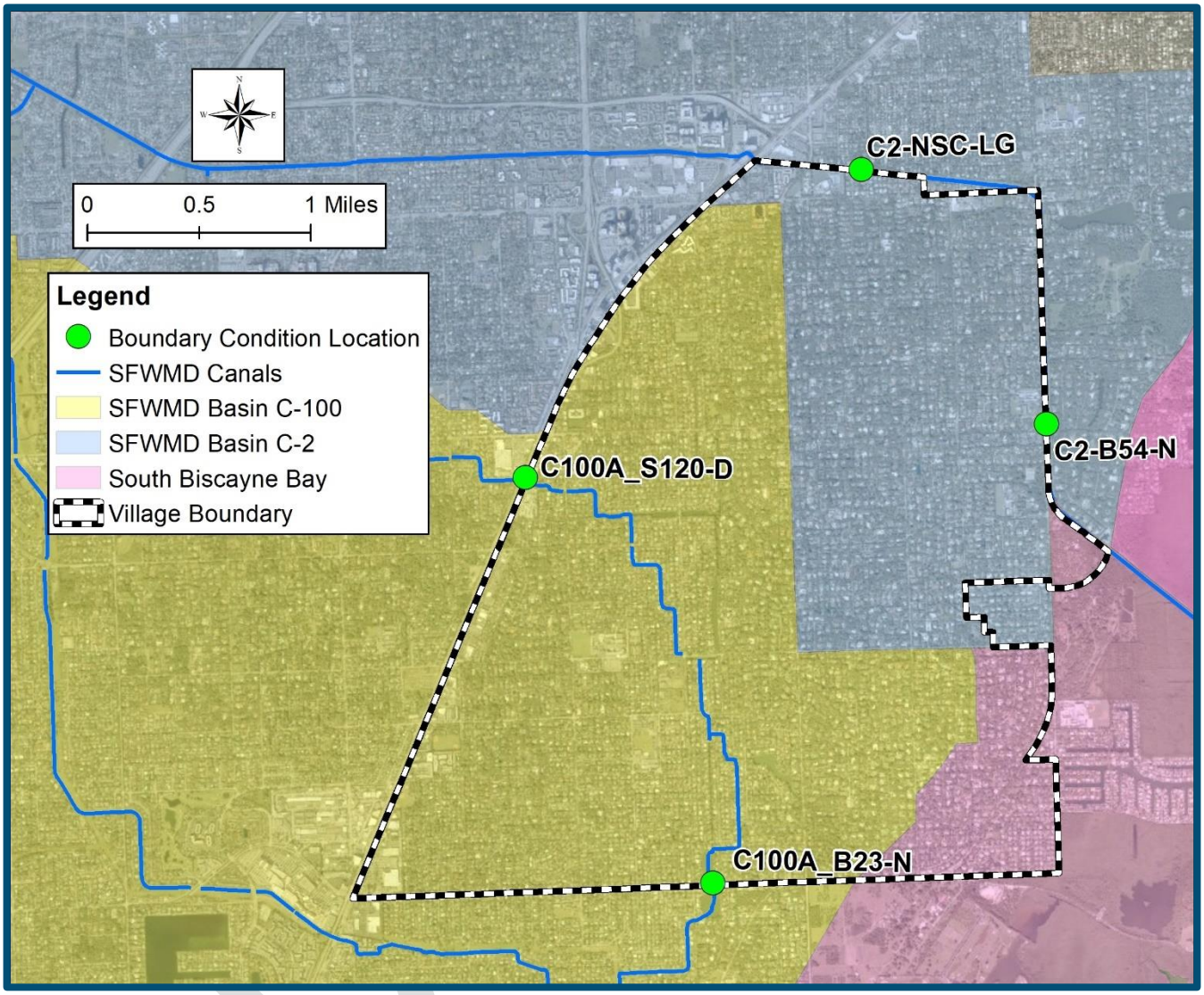


Figure 3-2. Boundary Condition Nodes

In addition, the County's Open Data Hub provides some useful information for the development of the VA (**Figure 3-3**). BCC collected readily available GIS data from this web portal. Topographic data in the form of a digital elevation model (DEM), land use, parcel lines, building footprints, and more are all included. A list of all applicable data that was obtained from the data portal is provided on the next page. Please see **Appendix A** for a complete catalog of all the collected data.

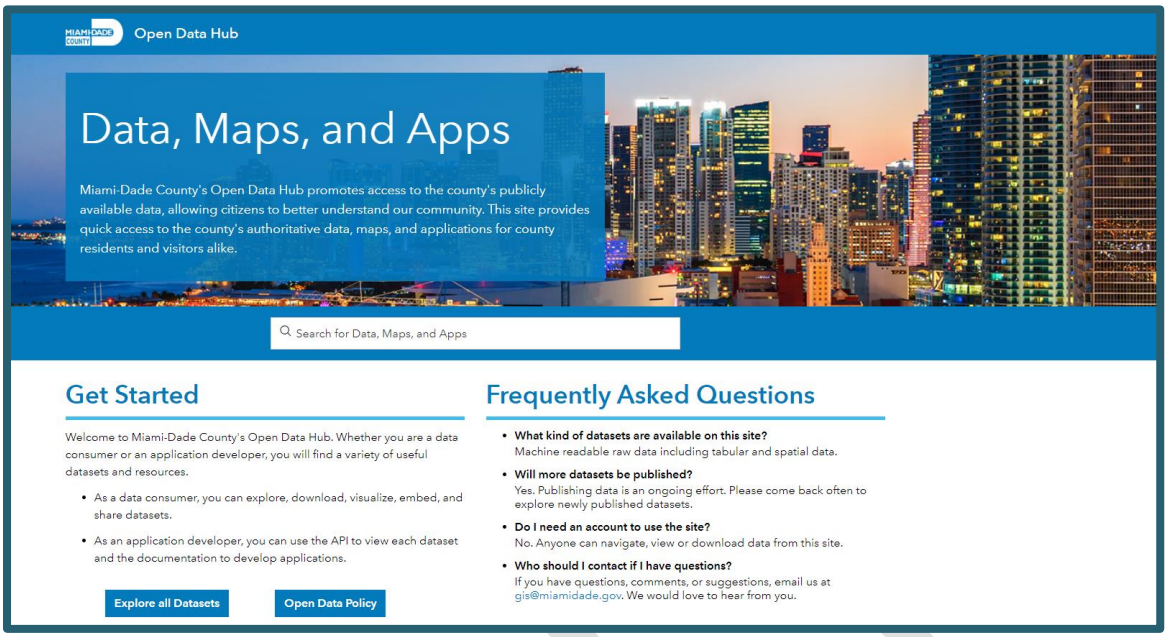


Figure 3-3. Miami-Dade County Open Data Hub

- Bridge
- Bus Shelter
- Major Roads
- Sanitary Sewer Pump Station
- Stormwater Line
- Solid and hazardous waste facilities
- Schools, including private, public and charter
- Fire stations
- Mental Health Center
- Ambulatory Surgical Center
- Mental Health Center
- DEM (2021, 5-ft resolution)
- Dump Site
- County Library
- Police Station
- Post Office
- Municipal Park
- Bus Stop
- Bus Route
- Rail
- Department of Health (DOH) Septic System
- Stormwater Point
- Disaster debris management sites
- College
- Hospitals
- Daycare
- DOH WIC Center
- Park Facility
- Building footprint 2D
- Landfill
- Fire Station
- Municipal Police Station
- County Operated Park

3.2.3 State Data

GIS data, including watershed boundaries, elevation certificates, transportation elements, climate and meteorology data sets, and geologic characteristics, can be obtained from the official geographic data portal of the state of Florida (**Figure 3-4**). This portal also provides datasets from other state agencies such as the Florida Department of Environmental Protection (FDEP), Florida Department of Transportation (FDOT), and Water Management Districts (WMDs). BCC collected readily available GIS data from this portal, which is listed below. Please see the complete data catalog in **Appendix A** for additional details.

- Bridge
- Certified Power Plants
- NEXRAD
- Solid & Hazardous Waste Facilities
- Solid Waste Disaster Debris Management Sites
- Major roads
- Public Library Locations, 2019
- SFWMD Facility Sites
- ERP Applications - Conservation Easements
- ERP Applications - Formal Wetland Determination

Figure 3-4. Florida Geospatial Open Data Portal

Florida Department of Environmental Protection (FDEP)

The Florida Department of Environmental Protection (FDEP) is the state's lead environmental management and stewardship agency, responsible for protecting air, water, and land. The FDEP assists residents and businesses in complying with environmental regulations through site visits and technical assistance. The FDEP reviews permit applications, inspects permitted facilities, responds to environmental damage reports, provides compliance assistance and enforcement, and maintains GIS data through its portal website (See **Figure 3-5**).

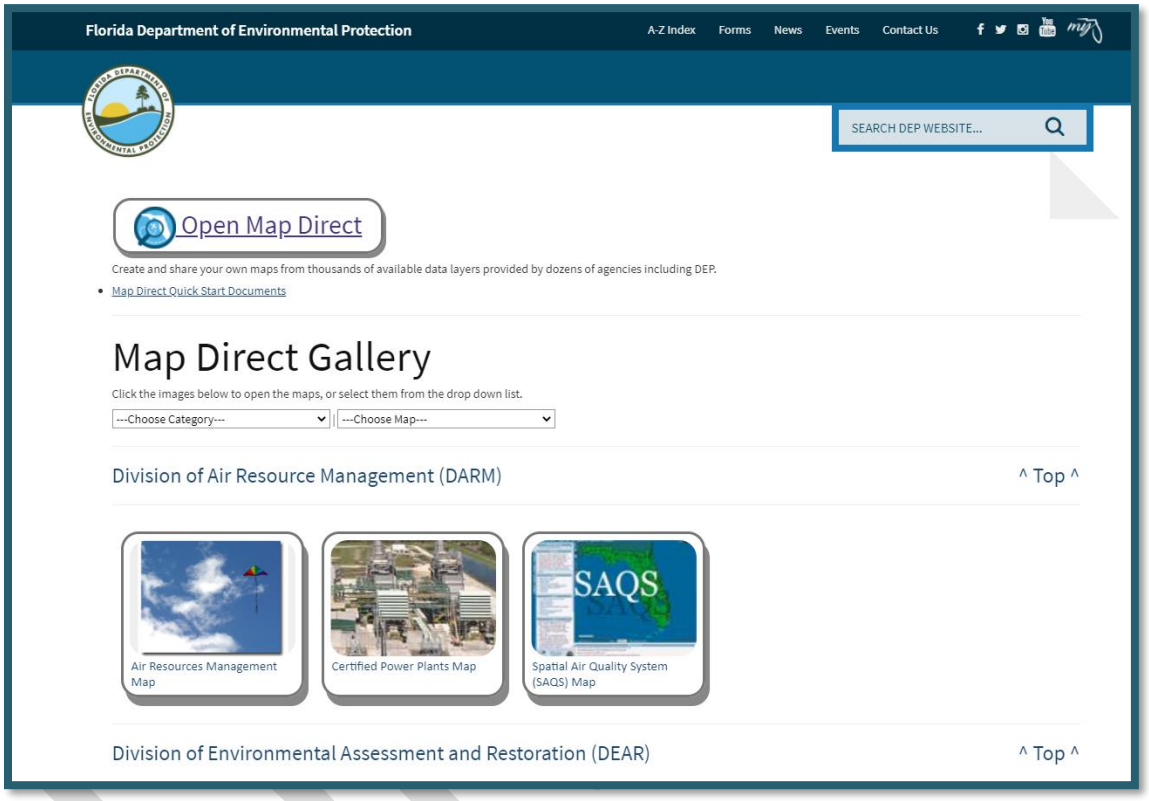


Figure 3-5. FDEP Direct Map ERP Portal

Florida Department of Transportation (FDOT)

The FDOT provides a safe transportation system for the mobility of people and goods, enhances economic prosperity, and preserves the quality of the environment and communities. The office of Transportation Data and Analytics (TDA) maintains the official FDOT linear referencing system of all roads, highways, traffic, travel time, multimodal, and freight and passenger data information. The TDA data and information cover a range of time periods: historical, current, and future. BCC collected readily available roadway data for this project. It must be noted that the same data was available from the county data source. **Appendix A** contains a complete catalog of all the data.

South Florida Water Management District (SFWMD)

The SFWMD retains a GIS data source for a variety of datasets, accessed from this link. This geospatial portal is a valuable source for additional data that is not available directly from other sources, such as land use, soils, aerial imagery, and so on. Although this data may not be updated on a regular basis, it may be used if other sources are unavailable. SFWMD has also estimated spatial rainfall data for the entire county. This data is based on Next Generation Radar (NEXRAD) Technology, which uses reflectivity to improve estimated rainfall amounts using calibrated algorithms. NEXRAD data is available with a 2km-by-2km grid resolution within every 15-minute interval. The specific NEXRAD grids that cover the Village are shown in **Figure 3-6**. The entire Village is covered by about 10 rain grids. The spatial NEXRAD information is available at the following website: NEXRAD Viewer.

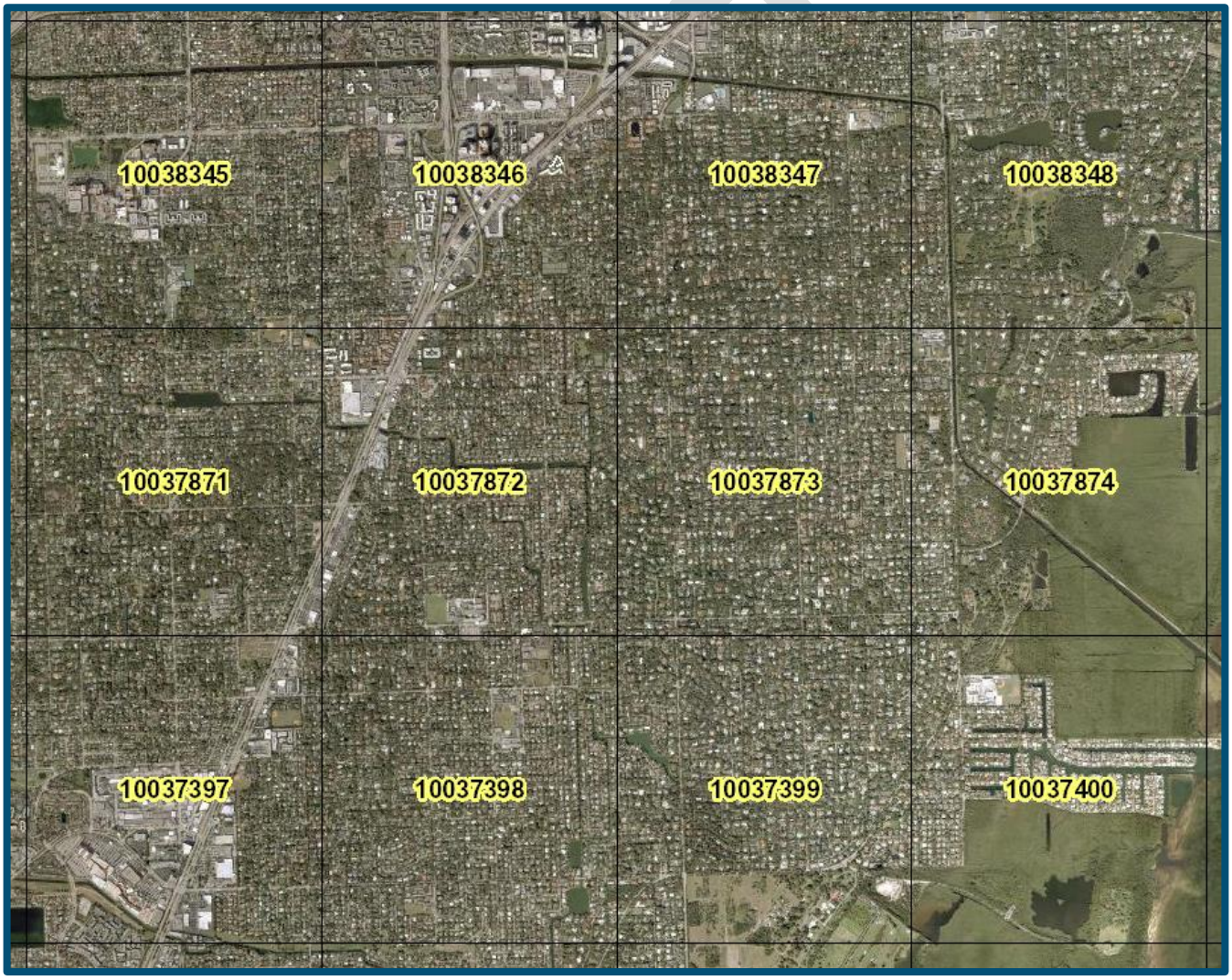


Figure 3-6. NEXRAD Grid Cover of the Village

BCC collected readily available data from the South Florida Water Management District (SFWMD). A complete catalog of all the data is presented in **Appendix A**.

Southeast Florida Regional Climate Compact

The Southeast Florida Regional Climate Change Compact was formed in January 2010 by Broward, Miami-Dade, Monroe, and Palm Beach Counties to coordinate mitigation and adaptation activities across county borders. Since that time, the four (4) Compact counties have improved local and regional responses to and preparations for the effects of climate change, such as sea-level rise, flooding, and economic and social disruptions. They have grown to include federal, state, regional, municipal, nonprofit, academic, and private sector partners.

In 2011, the Southeast Florida Regional Climate Change Compact produced the first Regionally Unified Sea Level Rise Projection for Southeast Florida. In 2015, the Projection was updated. In 2019, the Compact organized a Sea Level Rise Work Group, which was comprised of academic experts from local, regional, and federal governments to update the Projection.

Each of the four (4) counties' Boards of County Commissioners has accepted or adopted the Climate Compact's Regionally Unified Sea Level Rise Projection and accompanying Guidance Report. All four (4) Compact counties have accepted or adopted the 2019 projection and guidance report. The Guidance Report contains directions and specific examples of how the projection can be used by local governments, planners, designers, engineers, and developers, as well as supporting documentation for the Projection. The projection is reviewed and updated every five (5) years, or sooner, because of ongoing advances in scientific knowledge and modeling related to global climate change via peer-reviewed literature. The most recent report can be found at the following link: Unified Sea Level Rise Projection Southeast Florida.

The Compact developed the Regionally Unified Sea Level Rise Projection to aid in the understanding of vulnerabilities and to provide a foundation for adaptation strategies, policies, and infrastructure design in the Southeast Florida region. Before developing a regionally consistent projection, the variety of local sea-level rise projections was a barrier to attaining consistent regional adaptation strategies and policies, as well as effectively affecting helpful policies at the state and federal levels. BCC Engineering LLC follows the compact to predict sea-level rise for the VA in this project.

3.2.4 Federal Data

Data was collected from a variety of federal data sources. The following subsections provide detailed information on the specific data that was retrieved.

United States Geological Survey (USGS)

The USGS was established by an act of Congress in 1879 and has evolved over the 125 years since, matching its talent and knowledge to the advancement of science and technology. The USGS is the only science agency within the Department of the Interior. Thousands of partners and customers seek out its natural science expertise and

vast earth and biological data holdings. The USGS serves the nation by providing accurate scientific information to describe and understand the Earth; minimizing loss of life and property due to natural disasters; managing water, biological, energy, and mineral resources; and improving and protecting our quality of life. The USGS is a world leader in natural sciences because of scientific excellence and responsiveness to societal needs.

USGS collects, monitors, analyzes, and provides science about natural resource conditions, issues, and problems as the nation's largest water, earth, and biological science and civilian mapping agency. Because of their expertise, this agency is able to conduct large-scale, multidisciplinary investigations and provide objective scientific information to resource managers, planners, and other customers.

The USGS prepared a study in collaboration with Miami-Dade County entitled "Hydrologic Conditions in Urban Miami-Dade County, Florida, and the Effect of Groundwater Pumpage and Increased Sea Level on Canal Leakage and Regional Groundwater Flow, Version 1.2 July 2016." The rise in groundwater levels in the region was estimated in this study. The change in water-table elevations caused by a rise of one (1) foot in sea level is reported in this study for 2045. This report can be used to calculate the amount of groundwater level rise in the Village in response to future sea-level rise. The following link will take you to a copy of the report: USGS Scientific Investigations Report 2014-5162.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) studies and forecasts climate, weather, oceans, and coasts. Their work aids in severe weather preparedness as well as international shipping. BCC collected readily available data from the NOAA website. A complete catalog of all the data is presented in **Appendix A**.

Digital Coast Data – Digital Elevation Model (DEM)

The latest available DEM for the project area was obtained using NOAA's online Data Access Viewer and Miami-Dade County. This viewer can be accessed via the following link: Digital Coast: Data Access Viewer.

The elevation information within the DEM is derived from LiDAR data that was collected by GPI via aerial mapping with 5-ft resolution in 2021 as part of the County's Information Technology Department (ITD) LiDAR project. As such, the DEM represents the topographic features of that period. All elevations within this dataset are reported in feet relative to the North American Vertical Datum of 1988 (NAVD88), which will be the reference vertical datum that will be utilized throughout the VA.

Vertical Datum Conversion Tool

For information that is based on the older National Geodetic Vertical Datum of 1929 (NGVD29), the NOAA online version of the National Geodetic Survey (NGS) Coordinate Conversion and Transformation Tool (NCAT) software will be utilized (**Figure 3-7**). The NGVD29 conversion to NAVD88 will be obtained by entering the coordinates of the project area into the online software, which can be accessed via the following link: NCAT Online Software.

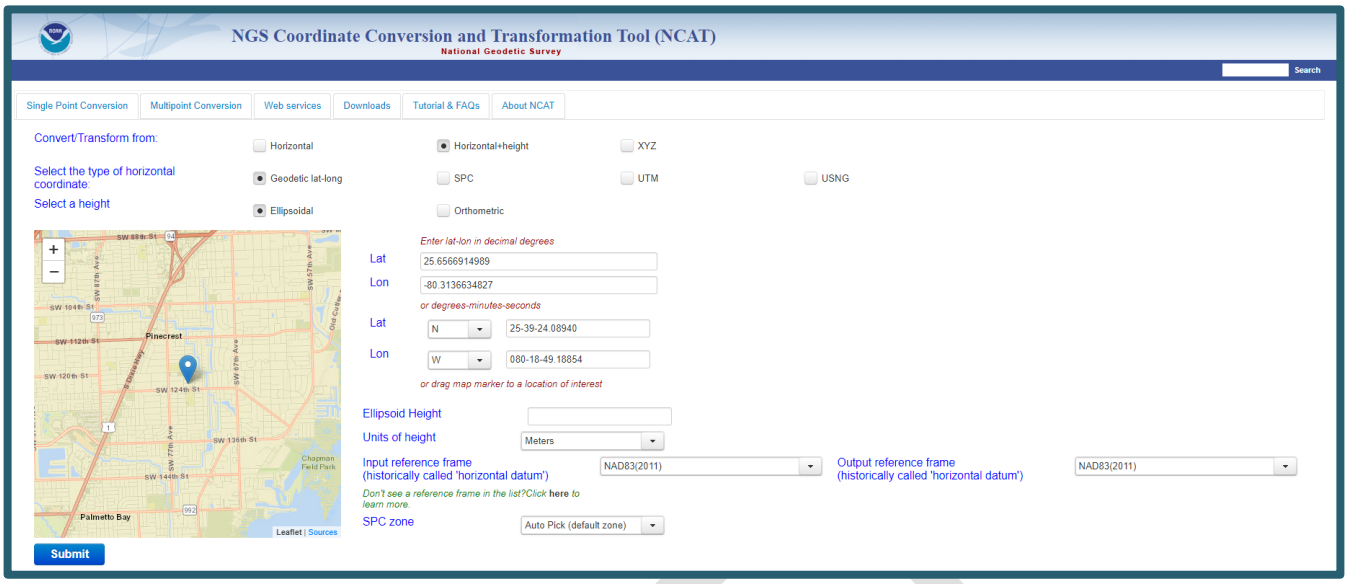


Figure 3-7. NOAA NCAT Horizontal/Vertical Datum Conversion Site

Atlas 14 Precipitation Frequency Estimates

The most recent rainfall depth-frequency information was obtained using the Precipitation-Frequency Atlas of the United States. The Florida region is covered by Volume 9 of the Atlas, which also examines seasonality, trends in annual maximum series data, and the temporal distribution of heavy precipitation. Precipitation Frequency Data Server (PFDS), a point-and-click interface that can be accessed by following the link, was used to retrieve this data: NOAA Atlas 14 PFDS.

United States Army Corps of Engineers (USACE)

In July 2009, the USACE prepared an Engineer Circular, which discussed future potential sea-level changes and their effects on managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects in coastal regions. This document references various locations in South Florida, which will be used to establish a planning horizon for the Village. This document is available via the following link: Sea-Level Change Considerations for Civil Works Programs.

The USACE works in partnership with other federal science and water management agencies, academic experts, the private sector, and other stakeholders to prepare a resilience community and develop and implement practical, nationally consistent, and cost-effective approaches and policies to reduce potential vulnerabilities to water infrastructures resulting from the climate change and variability. Under the Responses to Climate Change Program, the USACE developed a Sea Level Change Curve Calculator and modified it to NOAA scenarios, helping people rapidly assess what the coming changes in sea level could look like. The USACE Calculator is designed based on the methodology described in Engineer Regulation (ER) 1100-2-8162 - Incorporating Sea Level Changes in Civil Works Programs (USACE 2013a) and Engineer Technical Letter (ETL) 1100-2-1—Procedures to Evaluate Sea Level Change: Impacts, Responses, and Adaptation (USACE 2014). The Calculator can plot both the USACE

and NOAA curves in feet or meters relative to either NAVD88 or LMSL (see **Figure 2-7**). It has been updated in 2022 and can be accessed from the following link: Sea-Level Change Curve Calculator.

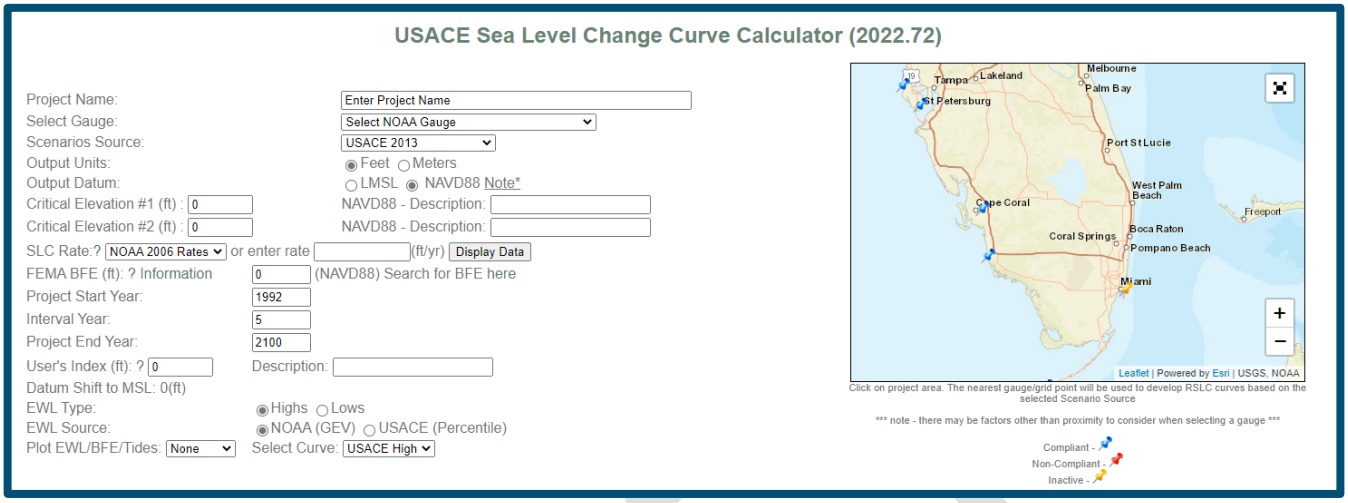


Figure 3-8. USACE Sea Level Change Curve Calculator

Natural Resources Conservation Services (NRCS)

The Natural Resources Conservation Services (NRCS) is a federal agency under the United States Department of Agriculture (USDA) that performs and maintains soil survey information for the United States. Through the USDA's Geospatial Data Gateway site, soil maps and data are available online for more than 95 percent of the nation's counties (See **Figure 3-9**). The site is updated and maintained online as the single authoritative source of soil survey information. The following link provides access to the site: USDA Geospatial Data Gateway.

Figure 3-9. USDA Geospatial Data Gateway Site

Additional data is available through this system, including digital ortho imagery, digital elevation models, and other cultural and demographic data. A complete catalog of all the data is presented in **Appendix A**.

NRCS also published the publication Urban Hydrology for Small Watersheds TR-55, which includes methods for calculating runoff based on precipitation and soil storage with the Soil Conservation Service (SCS) Curve Number (CN) method. This document can be accessed via the following link: USDA TR-55.

3.2.5 Data from other sources

Reports and study documents were sourced, which provided insight into prior VA evaluation efforts and recommendations on VA improvement projects. The applicable document that was sourced, along with the respective owner/developer and date of the document, is provided below.

- *Village of Pinecrest Stormwater Master Plan 2015 Final Report*
- *Village of Pinecrest Comprehensive Development Master Plan, Updates, Goals, Objectives, and Policies 2016*

4.0 Data Evaluation & Gap Analysis

The data collected from the Village and other sources was evaluated to define the completeness and viability to identify the pertinent items that would be applicable to the development of the VA. The following sub-sections detail the relevant components of the data collected and their potential role in the development of the VA.

4.1 Village of Pinecrest Data

With regards to the Village data, the Village provided a GIS database of the Village's stormwater geodatabase, GIS shapefiles of Village owned and/or maintained assets/infrastructure, a GIS database of available Finished Floor Elevations (FFEs) for Village-owned assets, as well as other supporting data, such as future land use. The data received from the Village will be critical for the development of the VA. In particular, a H&H model will be developed to incorporate the four (4) different future scenarios that are required as part of the RF program grant requirements. The models will then be utilized to assess the impact of sea-level rise, groundwater rise, and increased rainfall amounts on the Village's existing critical infrastructure.

4.2 Other Data Sources

The data collection effort associated with this task was primarily focused on collecting the necessary data to ensure the VA development can be completed. The most important data collected thus far included the following:

- Geospatial coverage for various model input parameters and critical infrastructure data that has been obtained from the County's Open Data Hub (i.e., GIS shapefiles).
- Latest LiDAR topographic information in the form of a DEM that has been retrieved from NOAA's digital access viewer.
- Technical documentation to determine logical sea-level/groundwater rise magnitudes and rainfall depth increases for future drainage conditions.

5.0 Critical Asset Inventory

5.1 Asset Inventory Identification

As part of this TM, all available data throughout the Village were collected in accordance with s. 380.093, F.S. The VA focuses only on the significant Village-owned or maintained assets and infrastructure. Therefore, private, county, or federal-owned or maintained assets were excluded from this analysis unless they have significant impacts on the Village-owned and maintained assets. Thus, the ownerships of all collected assets were investigated individually. In order to determine the asset ownership, metadata for each dataset was reviewed. Other sources such as the Miami-Dade Property Appraiser website and Village staff knowledge, were utilized in this process.

Based on the FDEP standard vulnerability assessment work guidance document, four (4) critical asset categories must be considered in the analysis:

(1) **Transportation assets and evacuation routes**:

These assets include:

- Airports
- Bridges
- Bus terminals
- Ports
- Major roadways
- Marinas
- Rail facilities
- Railroad bridges

(2) **Critical infrastructure**:

These assets include:

- Wastewater treatment facilities and lift stations
- Stormwater treatment facilities and pump stations
- Drinking water facilities
- Solid and hazardous waste facilities
- Military installations
- Communications facilities
- Disaster debris management sites

(3) **Critical community and emergency facilities**:

These assets include:

- Schools
- Colleges
- Universities
- Community centers
- Correctional facilities
- Disaster recovery centers
- Emergency medical service facilities
- Emergency operation centers
- Fire stations
- Healthcare facilities
- Hospitals
- Law enforcement facilities
- Local government facilities
- Logistical staging areas
- Affordable public housing
- Risk shelter inventory
- State government facilities

(4) **Natural, cultural, and historical resources**:

These assets include:

- Conservation lands
- Parks
- Shorelines
- Surface waters
- Wetlands
- Historical and cultural assets

All identified Village-owned assets and infrastructures were presented to the Village staff during a coordination meeting to obtain feedback and final refinements to the assets. The final list of the critical assets evaluated as part of this study is as follows:

(1) Transportation assets and evacuation routes:

- Village major roadways:
  i. Major roadways that lead to the evacuation routes.

(2) Critical infrastructure:

- Outfalls:
  i. Sixty-three (63) outfalls were identified within the Village.
- Major Culvert Crossing:
  i. Sixteen (16) culverts within the Village were identified.

(3) Critical community and emergency facilities:

- Village Municipal Center:
  i. One (1) Village Hall structure was identified within the Village.
- Law Enforcement Facilities:
  i. One (1) Police Station was identified within the Village.
- Village Community Center:
  i. One (1) Community Center was identified within the Village.
- Public Works:
  i. One (1) Public Work and one (1) Library were identified within the Village.
- Fire Station:
  i. One (1) Fire and Rescue Station was identified within the Village.

(4) Natural, cultural, and historical resources:

- Parks:
  i. Nine (9) parks were identified within the Village.

The locations of the critical assets and infrastructure are represented in **Appendix B**.

5.2 Topographic Data

5.2.1 Digital Elevation Model

Topographic information for the Village was obtained from the Miami-Dade County GIS webpage in the form of a Digital Elevation Model (DEM). The DEM represents topographic land features using a raster data based on a grid system. More specifically, each grid has a cell size of 5.0 feet (5.0’ x 5.0’ pixels) and represents a single

elevation, reflecting the average of all elevations encountered within the respective cell. The elevation information within the DEM is derived from LiDAR data collected via aerial mapping in the year 2021, developed by GPI. As such, the DEM represents the topographic features of that year (**Figure 5-1**).

In terms of the vertical datum, the DEM conforms to the North American Vertical Datum of 1988 (NAVD88). For congruency, all elevations obtained from pertaining documents based on the National Geodetic Vertical Datum of 1929 (NGVD29) were converted to the more modern datum (NAVD88). As seen in **Figure 5-1,** ground elevations throughout the Village vary between 0.0 feet (ft.) to 36.0 ft. NAVD88.

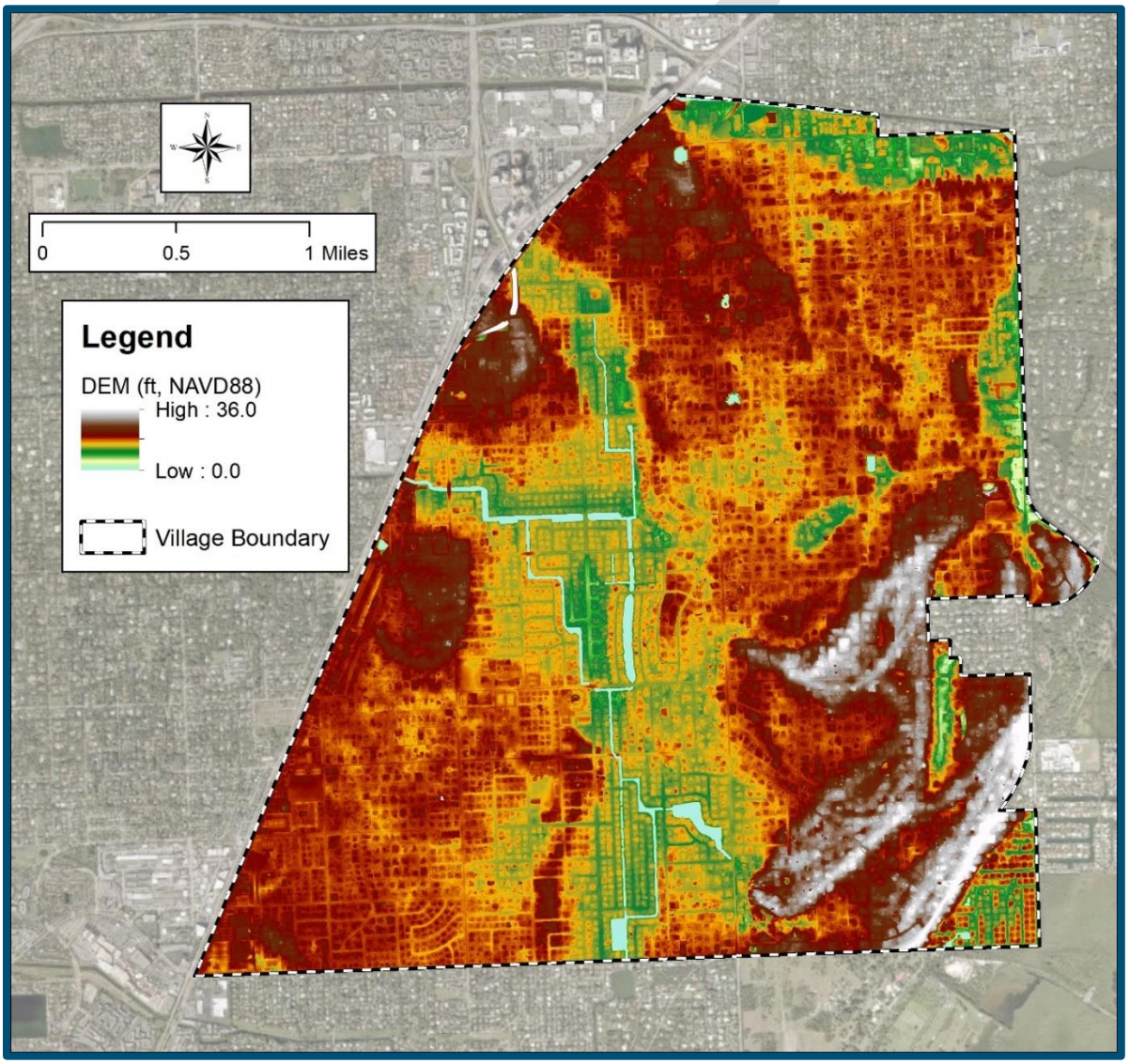


Figure 5-1. Topography within the Village

5.2.2 Surveyed Finished Floor Elevation (FFE)

The Village maintains a database of elevation certificates for properties located within their respective limits. This elevation certificate was obtained from Kimley-Horn Engineering Incorporation.

5.2.3 FFE Estimation using DEM

In order to obtain the FFEs for those assets with no elevation certificate information, a methodology using DEM and GIS will be utilized. This method requires the building footprints polygon shapefile, which will be obtained from the County's GIS Open Data Hub. The FFE for each asset will be estimated by extracting the elevation from the DEM for the closest adjacent crown of road, or the highest edge of the roadway cross-section and adding eight (8) inches to that value. This method coincides with Section 11C-3 of the County's Code of Ordinances. FFEs will be estimated for assets with no elevation certification using this GIS model.

5.2.4 Datum Conversion

For information that was based on the older National Geodetic Vertical Datum of 1929 (NGVD29), the conversion factor of 1.54 ft. was used to convert the elevations to the North American Vertical Datum of 1988 (NAVD88). This method uses the NOAA online version of the National Geodetic Survey (NGS) Coordinate Conversion and Transformation Tool (NCAT) software (**Figure 5-2**).

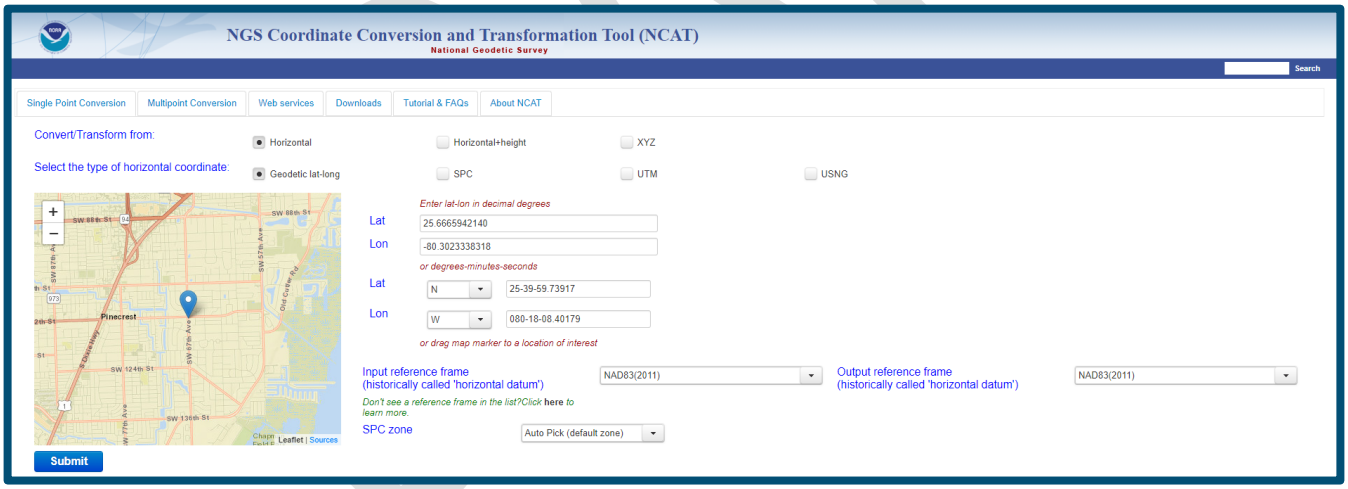


Figure 5-2. NOAA NCAT Conversion Website

5.3 Flood Scenario-Related Data

5.3.1 Precipitation Data

Florida International University (FIU) Sea Level Solutions Center (SLSC) published a report in 2021 concerning updates for statewide extreme rainfall projections. The objective of the report was to advise the Florida Building Code (FBC) of potential updates to the County's flood and rain loads that may alter flood risks due to climate

change. The study focused on both sea-level rise and changes in rainfall extremes within the County. A copy of the report can be accessed via the following link: Updating the Statewide Extreme Rainfall Projections.

As part of the study, the FIU SLSC developed multiplier values, referred to as Change Factors (CFs), that can be used in conjunction with the NOAA Atlas 14 rainfall Depth-Duration-Frequency (DDF) data to determine future rainfall depths. This approach allows historical observations and results from future climate models to be objectively integrated to determine nonstationary future extreme rainfall. Due to the variability in impacts among different climate data sets and the regional variability in rainfall, three (3) different percentiles were established for CF values. These included the 17th, 50th, and 83rd percentile. Based on the risk tolerance of future projects, the median 50th percentile will be utilized for CF values.

The CF values were determined using the FIU SLSC interactive online tool, shown in **Figure 5-3**, for the future period between the years 2030 and 2069. This tool can also be used to determine CF values for future planning horizons between the years 2060 and 2099. This tool can be accessed via the following link: FIU SLSC Online Tool.

Figure 5-3. Screenshot of FIU's SLSC Interactive Online Tool

The NOAA Atlas 14 Point Precipitation Frequency Estimated tool was used to collect the existing rainfall condition of the designed storm events within the Village. Using the CF factors, the future rainfall depths within

the Village bounds are estimated for the years 2040 and 2070 (**Table 5-1** and **Table 5-2**). These projected rainfall depths will be utilized in Task 4 (exposure analysis) to simulate the future flooding conditions.

Table 5-1. Change Factor (CF) and Estimated Future Rainfall Depth for the Year 2040

Design Storm Event	Existing Condition Rainfall Depth (in.)	50th Percentile (Median) Change Factor (CF) Value	Future Condition Rainfall Depth (in.)
5-YR 24-HR	6.90	1.08	7.45
10-YR 24-HR	8.33	1.09	9.08
25-YR 72-HR	12.90	1.09	14.06
100-YR 72-HR	17.50	1.14	19.95
500-YR 72-HR	23.80	1.24*	29.51
1000-YR, 72-HR	26.90	1.39*	37.39

* FIU has not developed a CF value for the 500YR-72HR storm event for the year 2040, and this value has been generated by a linear regression relationship.

Table 5-2. Change Factor (CF) and Estimated Future Rainfall Depth for the Year 2070

Design Storm Event	Existing Condition Rainfall Depth (in.)	50th Percentile (Median) Change Factor (CF) Value	Future Condition Rainfall Depth (in.)
5-YR 24-HR	6.90	1.11	7.66
10-YR 24-HR	8.33	1.13	9.41
25-YR 72-HR	12.90	1.11	14.32
100-YR 72-HR	17.50	1.17	20.48
500-YR 72-HR	23.80	1.36*	32.37
1000-YR, 72-HR	26.90	1.61*	43.31

* FIU has not developed a CF value for the 500YR-72HR storm event for the year 2070, and this value has been generated by a linear regression relationship.

5.3.2 Sea Level Rise (SLR) Projections

The United States Army Corps of Engineers (USACE) developed a standard Sea Level Change Curve Calculator and modified it to NOAA scenarios under the Responses to Climate Change Program to help communities to rapidly assess the changes in sea level. Standardizing the projection of sea level rise has been an important step for water management organizations and local, state, and federal agencies in southeast Florida. The projections developed by the USACE are based on the methodology described in Engineer Regulation (ER) 1100-2-8162 - Incorporating Sea Level Changes in Civil Works Programs (USACE 2013a) and Engineer Technical Letter (ETL) 1100-2-1—Procedures to Evaluate Sea Level Change: Impacts, Responses, and Adaptation (USACE 2014). The projections account for various source scenarios, such as the Global and Regional Sea Level Rise Scenarios for

the United States (NOAA, 2017). The NOAA's sea level rise projections include seven (7) scenario curves as listed below:

- NOAA Extreme
- NOAA High
- NOAA Intermediate-High
- NOAA Intermediate
- NOAA Intermediate-Low
- NOAA Low
- NOAA VLM (Vertical Land Movement)

The NOAA Extreme curve is solely for showing the upper limit of sea level rise and huge ice melting. It is included for informational purposes and is not considered for application. The NOAA High Curve is applied for the planning, design, and construction of critical, high-risk projects to be in service after 2070 or for projects that are not easily replaceable or critically interdependent with other infrastructure and services. The NOAA Intermediate-High curve is recommended for short-term or non-critical infrastructure in service during or after 2070.

According to s. 380.093, F.S., at least two (2) sea level rise projections, including 2017 NOAA Intermediate-Low and Intermediate-High sea-level rises, should be considered as part of the Vulnerability Assessment. Three gauge stations were identified along the East Coast of Florida, containing data pertinent to the NOAA 2017 scenario. The distance to each station and the available data records were analyzed to determine the gauges that would be selected for the study. The Virginia Key tide gauge (NOAA Station ID Number 8723214) was selected to obtain NOAA 2017 sea level rise projections (**Figure 5-4**). The decision to use this station was approved by the Florida Department of Environmental Protection.

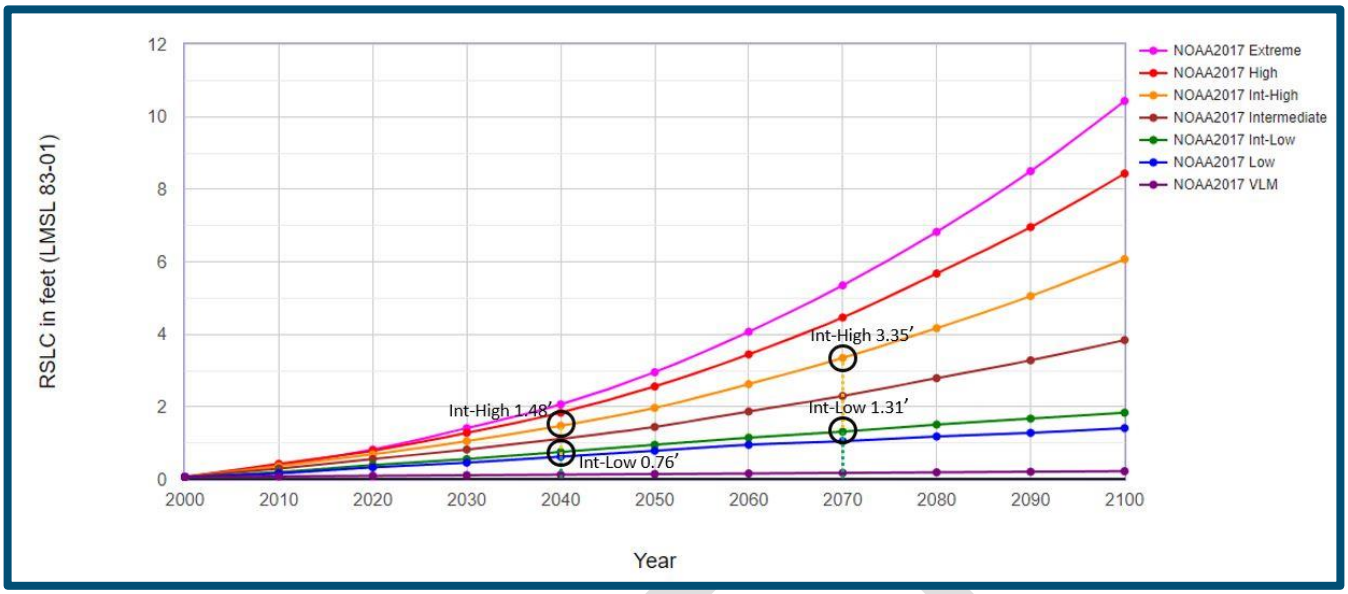


Figure 5-4. NOAA 2017 Sea Level Change Projection for Virginia Key Gauge Station

The sea level rise projections are based on the sea level data from the year 2000 as the base elevation. The selected NOAA tide gauge (Virginia Key tidal gauge) has recorded tidal elevations since 1994. The decadal sea level rise at the station is presented in **Table 5-3**.

Table 5-3. Decadal Sea Level Rise: Virginia Key Tide Gauge Station

Year	NOAA2017 VLM (ft.)	NOAA2017 Low (ft.)	NOAA2017 Int-Low (ft.)	NOAA2017 Intermediate(ft.)	NOAA2017 Int-High (ft.)	NOAA2017 High (ft.)	NOAA2017 Extreme (ft.)
2000	0.07	0.07	0.07	0.07	0.07	0.07	0.07
2010	0.08	0.16	0.20	0.30	0.36	0.43	0.39
2020	0.10	0.33	0.39	0.56	0.69	0.79	0.82
2030	0.11	0.46	0.56	0.82	1.05	1.28	1.41
2040	0.13	0.62	0.76	1.12	1.48	1.84	2.07
2050	0.14	0.79	0.95	1.44	1.97	2.56	2.95
2060	0.16	0.95	1.15	1.87	2.63	3.45	4.07
2070	0.18	1.05	1.31	2.30	3.35	4.46	5.35
2080	0.19	1.18	1.51	2.79	4.17	5.68	6.82
2090	0.21	1.28	1.67	3.28	5.05	6.96	8.50
2100	0.22	1.41	1.84	3.84	6.07	8.43	10.43

Considering that VA will be a critical component of the Village's resiliency plan in the decades to come, it is reasonable to consider the NOAA Intermediate-High curve and NOAA Intermediate-Low curves and identify the risks posed to critical assets and infrastructure. Moreover, the year 2040 and 2070 planning horizons are chosen for planning purposes to provide sufficient time for the Village's adaptation plan for the next 20 and 50 years.

Referring to **Figure 5-4** and **Table 5-3**, it can be discerned that the sea level rose by 7.44 inches between 2000 and 2020 following the NOAA Intermediate-High curve and by 3.84 inches following the NOAA Intermediate-Low curve. Based on the NOAA Intermediate-High curve, sea level rise projections for the years 2040 and 2070 are 17.76 and 40.2 inches, respectively. In turn, 9.12 and 15.72 inches of sea level rise are predicted using the NOAA Intermediate-Low curve for the years 2040 and 2070, respectively.

5.3.3 Groundwater Level Data

The USGS published a report in 2016 in collaboration with the County's Water and Sewer Department (WASD) that investigated the hydrologic conditions in the county and how rising groundwater pumpage and sea level affect regional groundwater flow. **Figure 5-5** represents the map that presents the change in water table elevations from one foot of sea-level rise for the projected sea-level rise in the year 2045. This map was used to estimate the groundwater rise within the Village for future sea level rise conditions. On the other hand, the *Village of Pinecrest Stormwater Master Plan Report,* adopted in 2015, also evaluated the projected groundwater rise that is anticipated for the Village for the 2030 and 2060 planning horizons. According to the SWMP report, a 0.5-foot increase along the coast and a 0.1-foot increase in other areas are projected by 2045. Following the USGS report, **Figure 5-5** defines groundwater rise in the region as one (1) foot of sea-level rise. In turn, **Figure 5-6** shows the groundwater elevation changes for one foot of sea-level rise based on the 2015 USACE high curve projections. Based on these maps, 0.5 feet of groundwater rise is predicted per each foot of sea level rise within the Village.

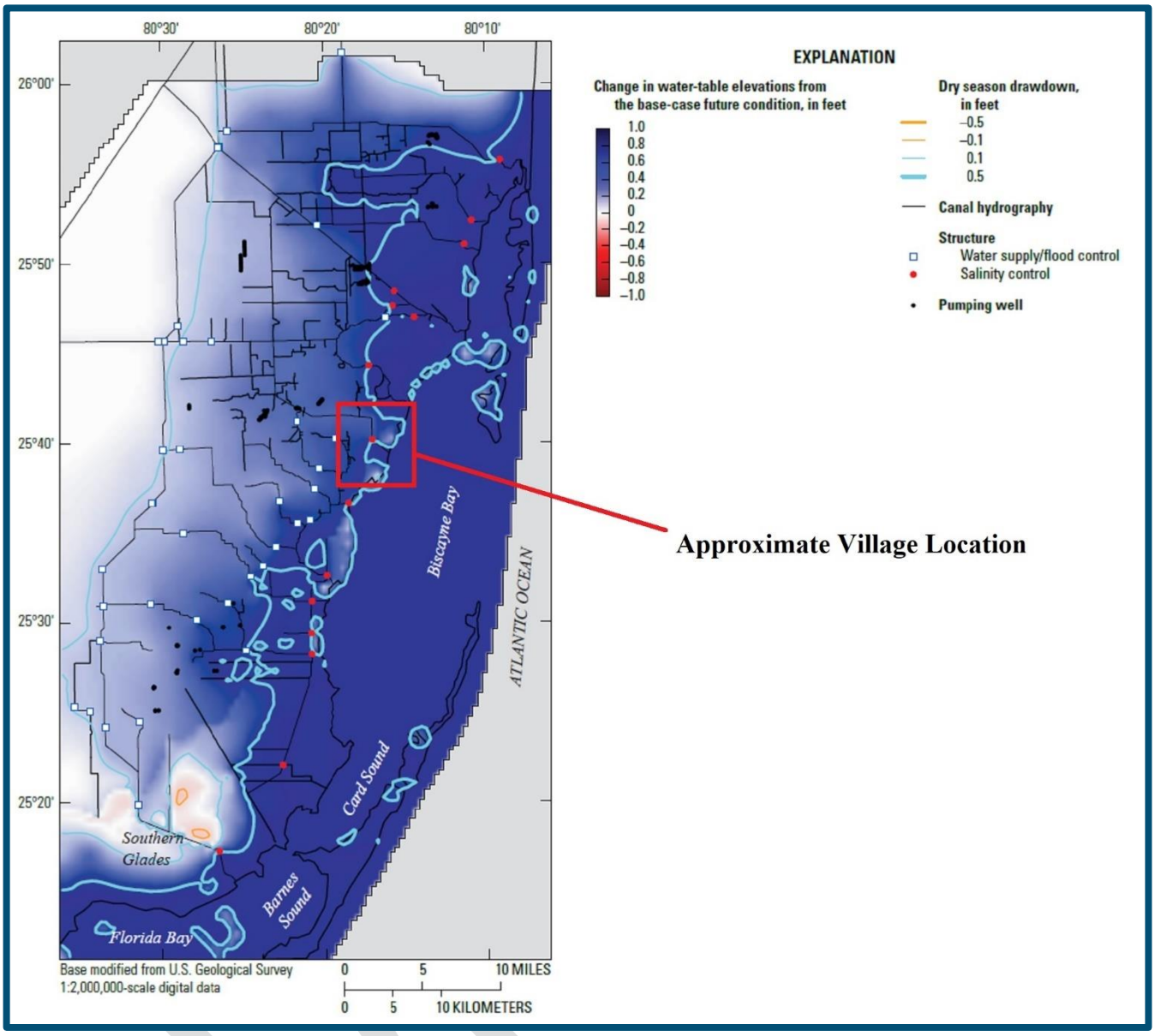


Figure 5-5. Hydrologic Conditions and Effect of Pumpage and Sea Level on Groundwater Regional Flow

Figure 5-6. Groundwater Level Rise by one Foot of Sea Level Rise within the Village

5.3.4 Tidal Datums and Tidal Flooding

Tidal water levels for the study area were obtained from the closest NOAA tidal station, which was determined to be the Virginia Key station (ID: 8723214) located in Biscayne Bay. The main information that was gathered from this station consisted of historical King tide elevations. More specifically, high, and corresponding low water levels were obtained for King tide events that have occurred in the past six (6) years. The data related to this station can be accessed through NOAA Tides & Currents.

5.3.5 Storm Surge

The exposed location of the Village in Biscayne Bay makes it vulnerable to the direct impact of storm surges. This study will consider the impact these storm surges have on the 2040 and 2070 modeling scenarios. NOAA's National Hurricane Center created a National Storm Surge Risk Maps that quantifies the storm surge flooding vulnerability to help the communities living in hurricane-prone coastal areas. The dataset to be used for this analysis can be accessed through National Storm Surge Risk Maps – Version 3.

5.3.6 Hydrostratigraphic Information

Hydrostratigraphic information is not applicable to the study area.

5.3.7 River Channel Cross-section

The channel river cross-section is not applicable to the study area.

5.3.8 Land Use Data

The land use maps within the Village signify a well-developed urbanized area. The most recent future land use map, depicted in **Figure 5-7**, was obtained from the Miami-Dade County Open Data Hub. This valuable data layer is also accessible through the ArcGIS online catalog. The map has been meticulously crafted by the Regulatory and Economic Resources (RER) Department's Planning Division, and its projections align with the Village of Pinecrest Comprehensive Development Master Plan Report, outlining anticipated developments up to the year 2030.

According to the latest mapping data, residential estate and residential modified estate together encompass approximately 69% of the Village's total area (see **Table 5-4**). These categories primarily involve single-family residences with low and medium densities. Additionally, impervious roadways cover around 17.7% of the land, contributing to the overall landscape composition.

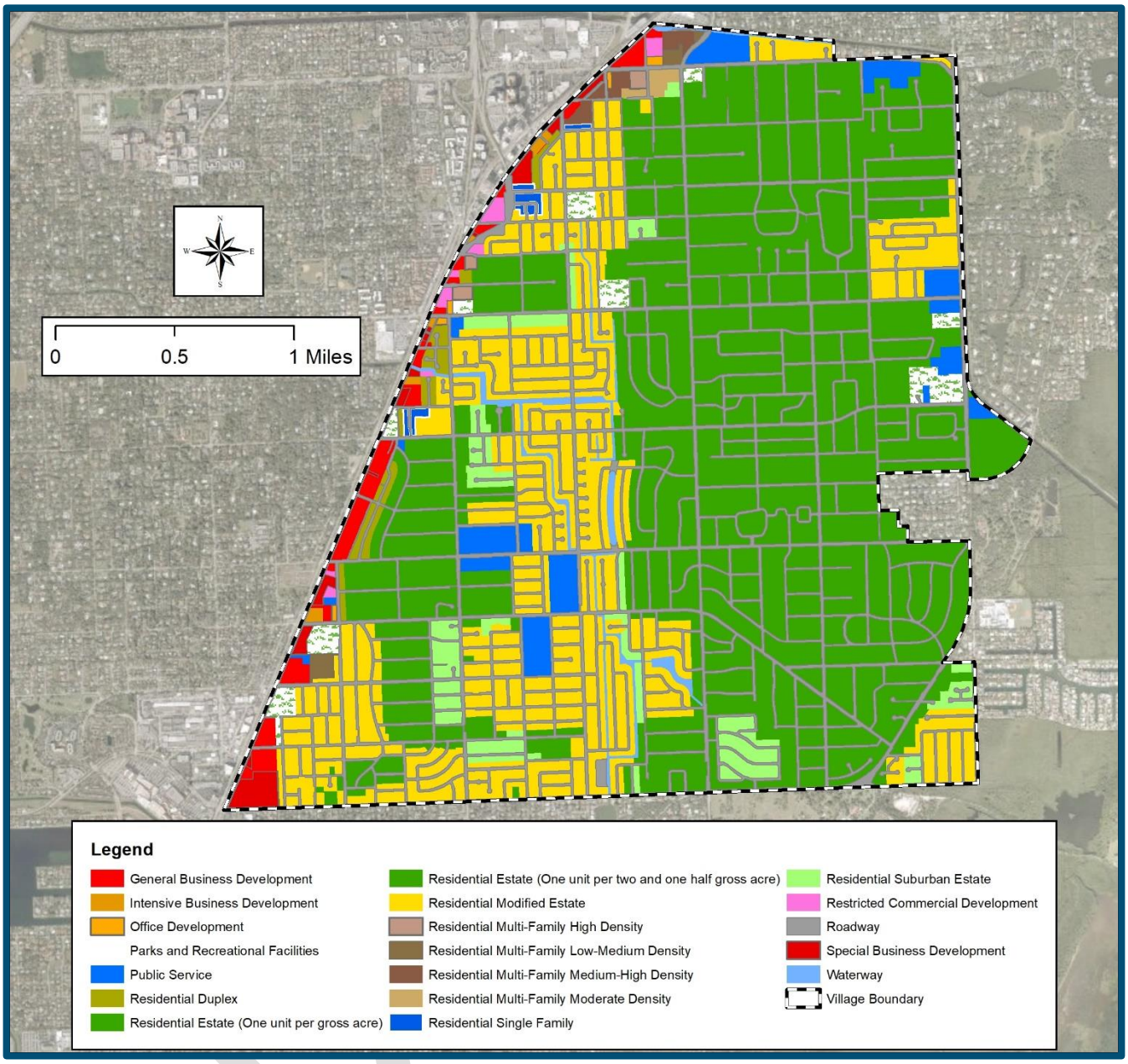


Figure 5-7. Future Land Use

Table 5-4. Future Land Use Distribution within the Village

Future Land use Type	Area (acres)	% of Village
Restricted Commercial Development	15.79	0.33
General Business Development	65.01	1.35
Special Business Development	39.84	0.83
Intensive Business Development	7.18	0.15

Future Land use Type	Area (acres)	% of Village
Residential Estate (One unit per gross acre)	2385.05	49.51
Residential Estate (One unit per two and one-half gross acre)	4.52	0.09
Residential Modified Estate	921.05	19.12
Residential Suburban Estate	155.18	3.22
Parks and Recreational Facilities	70.06	1.45
Public Service	134.53	2.79
Roadway	854.86	17.74
Residential Single Family	12.92	0.27
Residential Duplex	37.63	0.78
Residential Multi-Family Moderate Density	9.88	0.20
Residential Multi-Family High Density	8.30	0.17
Residential Multi-Family Low-Medium Density	11.12	0.23
Residential Multi-Family Medium-High Density	18.35	0.38
Office Development	5.60	0.12
Waterway	60.69	1.26
Total	**4817.57**	**100**

5.4 Critical/Regionally Significant Assets Inventory

5.4.1 Transportation Assets and Evacuation Routes

The Village owned or maintained transportation assets and infrastructure were identified and mapped (**Figure 5-8**). The transportation assets include: "Village major roads." The primary major roads are section or quarter roadways or those leading to the evacuation routes. The major roads in the Village are:

- SW 88th St,
- S DIXIE HWY,
- SW 67th AVE,
- SW 57th AVE,
- SW 77th AVE,
- SW 112th ST,
- SW 72nd AVE,
- SW 96th St,

- SW 104th St,
- SW 128th St,
- SW 82nd AVE,
- SW 120th St,
- SW 62nd AVE,
- SW 136th St,
- OLD CUTLER RD,
- SR 826 EXT,
- SW 111th St,
- N KENDALL DR.

Approximately 35.71 miles of major roads are identified throughout the Village. It must be noted that some segments of the two major roads located at the west border, S DIXIE HWY, and south border, SW 136th St, of the Village are out of the Village borderline. A large-scale map of the Village's transportation assets and evacuation routes is provided in **Appendix B**.

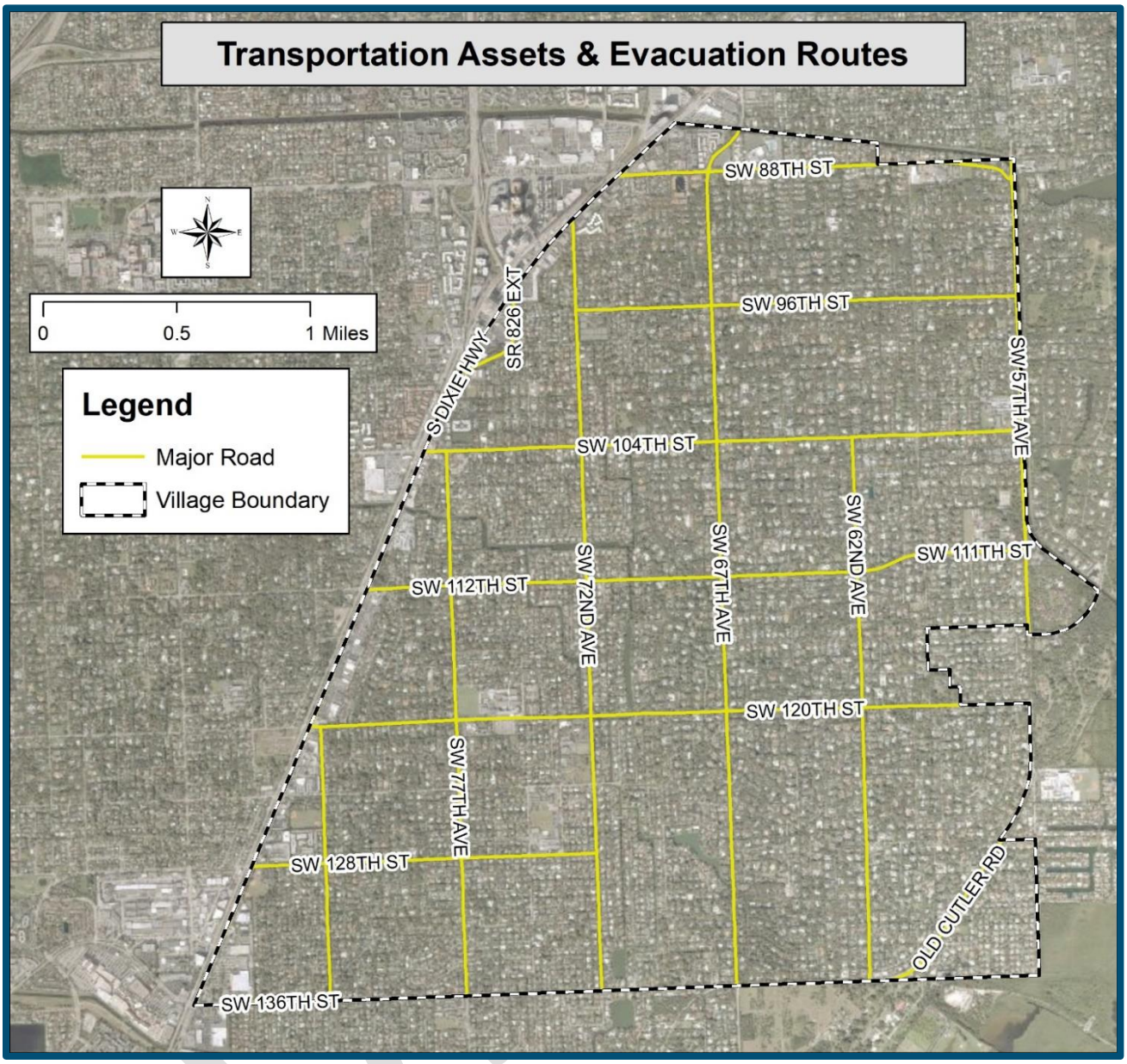


Figure 5-8. Transportation Assets

5.4.2 Critical Infrastructures

Figure 5-9 represents all identified critical infrastructure within the Village, which includes sixty-three (63) outfalls and sixteen (16) culverts crossing Village roads. A large-scale map of all the critical infrastructures is represented in **Appendix B**.

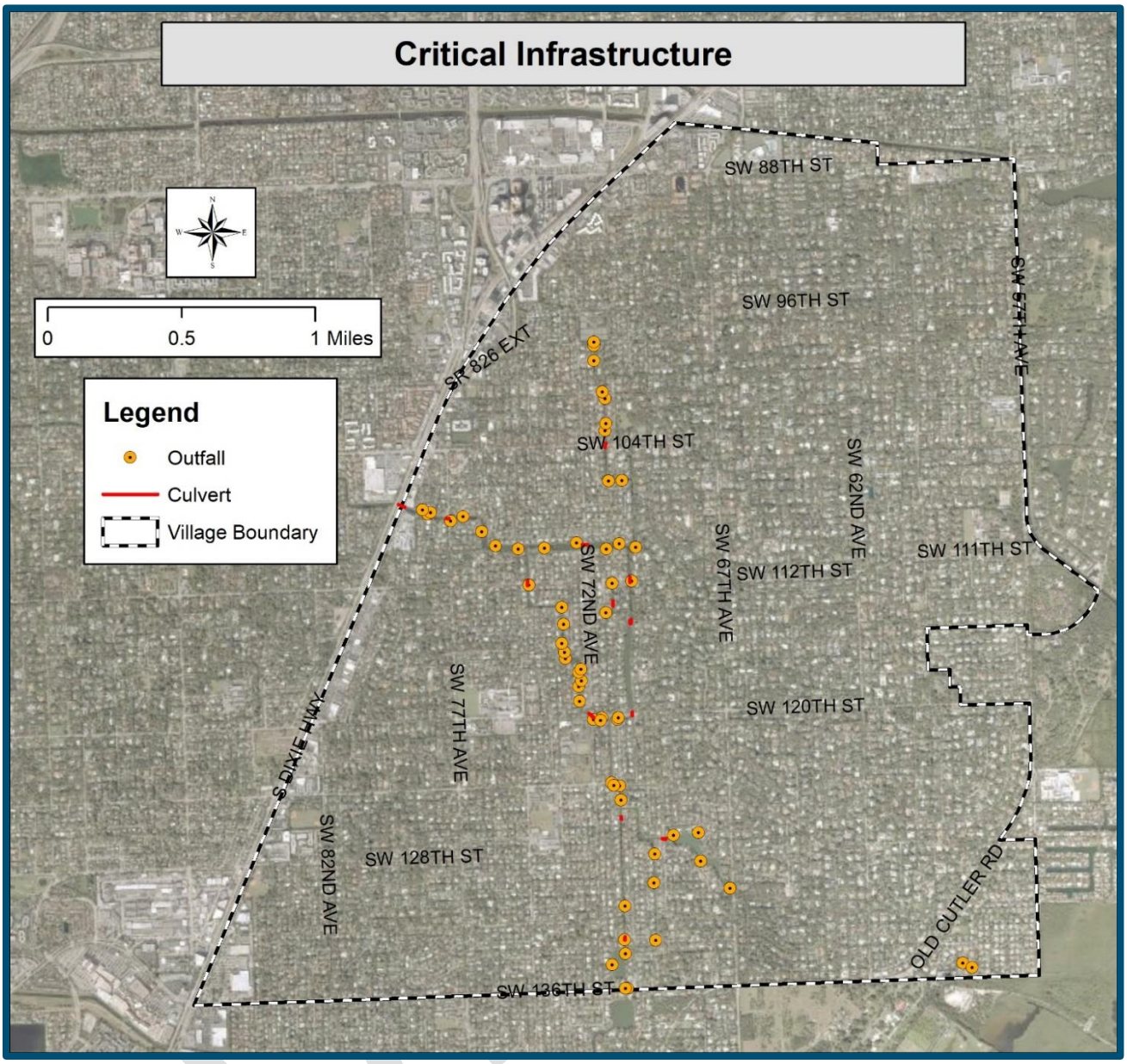


Figure 5-9. Critical Infrastructure Assets

5.4.3 Critical Community and Emergency Facilities

The Village's critical community and emergency facilities were identified and presented to the Village staff for final refinements. **Figure 5-10** shows all identified critical community and emergency facilities. This map includes one (1) police station, one (1) village hall, one (1) public work, one (1) fire and rescue station, one (1) community center, and one (1) library. A large-scale map of all the critical community and emergency facilities is represented in **Appendix B**.

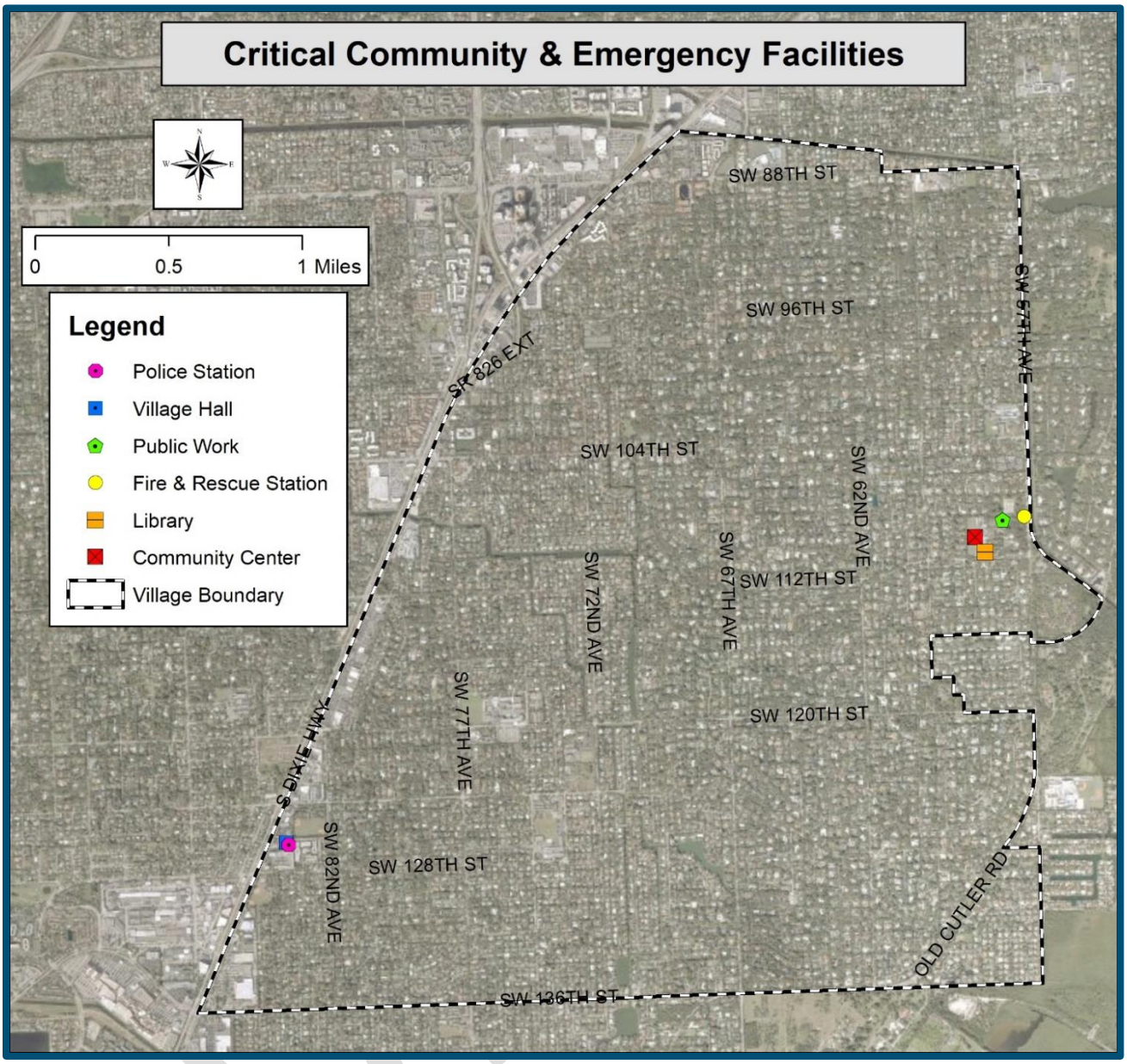


Figure 5-10. Critical Community and Emergency Facilities

5.4.4 Natural, Cultural, and Historical Resources

The Village's natural, cultural, and historical resources were identified and presented to the Village personnel for final refinements (**Figure 5-11**). Ultimately, one (1) asset category type was identified, which includes nine (9) parks. These parks include:

- Coral Pine Park
- Flagler Grove Park
- Veterans Wayside Park

- Evelyn Greer Park
- Suniland Park
- Pinecrest Gardens
- Red Road Linear Park
- Hidden Pine Park
- Linear Park

These parks cover an approximate area of 55.91 acres. A large-scale map of these resources is represented in **Appendix B**.

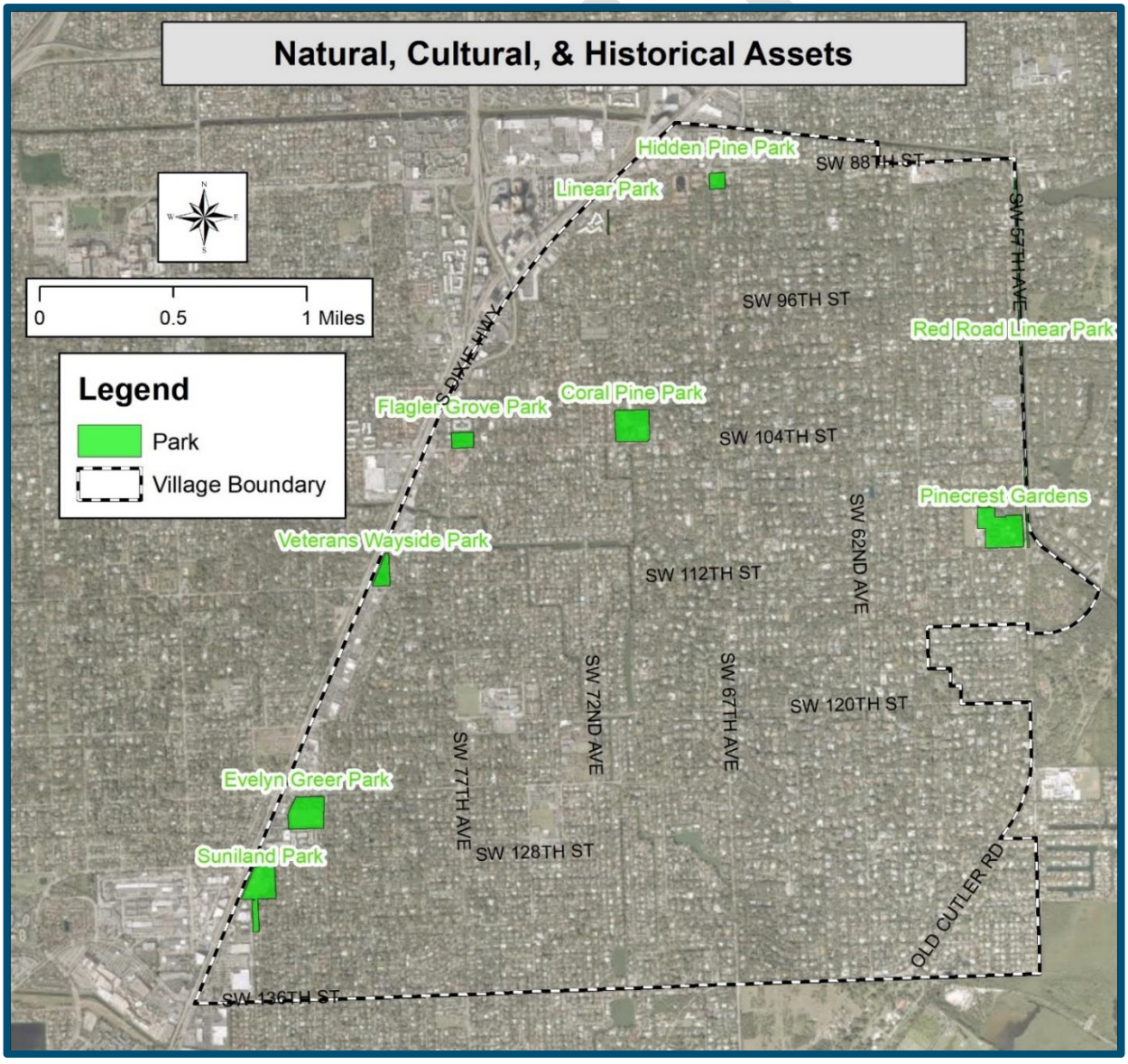


Figure 5-11. Natural, Cultural, and Historical Resources Asset

6.0 Project Coordination (Kickoff Meeting)

6.1 Meeting Agenda

The agenda of the kickoff meeting has been included in **Appendix C**.

6.2 Meeting Attendance

The meeting attendance record is provided in **Appendix C**.

6.3 Materials Distributed

A copy of the project schedule has been included in **Appendix C**.

6.4 Meeting Minutes

The meeting minutes documenting all decisions and agreed upon outcomes of the meeting are provided in **Appendix C**.

6.5 Steering Committee

The following members of the Village Staff have been identified as potential members of the steering committee:

A. David J. Mendez (dmendez@pinecrest@pinecrest-fl.gov)
B. Chris Revilla (crevilla@pinecrest-fl.gov)
C. Eduardo Pozas (epozas@pinecrest-fl.gov)

6.6 Request for Participation in Steering Committee

The draft email to potential steering committee members has been included in **Appendix C**. The email contains the project purpose, goals, schedule, project meeting dates, and overall desired outcomes.

7.0 Exposure Analysis

7.1 Background

An exposure analysis provides information about the elements and critical assets that are located within flood-prone areas or areas at risk of flooding. The results of exposure analysis are important and useful as the foundation of preparedness plans, early warning systems, response recovery, and mitigation to decision-makers. The purpose of the exposure analysis is to identify the depth of water caused by sea level rise, groundwater level rise, storm surge, and rainfall increase, as well as compound flood scenarios. In the current effort, exposure analysis is completed for two (2) sea-level rise scenarios for two (2) planning horizons:

- NOAA 2017 intermediate-low sea level rise projection for year 2040
- NOAA 2017 intermediate-high sea level rise projection for year 2040
- NOAA 2017 intermediate-low sea level rise projection for year 2070
- NOAA 2017 intermediate-high sea level rise projection for year 2070

Six (6) design storm events were considered in each scenario for exposure analysis:

- 5year-24hour design storm event
- 10year-24hour design storm event
- 25year-72hour design storm event
- 50year-72hour design storm event
- 100year-72hour design storm event
- 500year-72hour design storm event

The exposure analysis also considered compound flooding scenarios, including storm surge conditions for Category 1 and Category 5 hurricanes, maintaining the same projected future planning horizons. In this context, two (2) design storm events were considered for the compound exposure analysis:

- 100year-72hour design storm event
- 500year-72hour design storm event

Examining this wide array of scenarios and storm events will provide valuable insights into the potential ramifications of sea level rise and storm surge within Village limits.

7.2 Village of Pinecrest SWMP (Existing Conditions Model)

The vulnerability assessment's exposure analysis utilized the C-2 and C-100 Basin models, which were originally developed by Miami-Dade County. These models were originally developed utilizing the XP-SWMM computer

model. XP-SWMM is a hydrodynamic model renowned for its ability to simulate various processes such as rainfall, infiltration, runoff, overland flow, storage within watersheds, and the dynamics of canal and pipe flows during storm events. Moreover, it factors in influences from tide and groundwater levels.

As part of this study, the C-100 and C-2 models were converted into EPA-SWMM format to facilitate integration into Stormwise (formerly known as ICPR4). Leveraging these models as a foundation, multiple hydrological parameters were updated to accurately reflect both current and projected future conditions within the Village. Boundary conditions for the C-2 and C-100 canals were updated in the models utilizing data provided by Miami-Dade County.

7.3 Future Conditions Model Development

7.3.1 Introduction

An updated H&H model was developed to conduct the exposure analysis of the future conditions within the Village of Pinecrest. The software that was utilized for these efforts was the latest version of Streamline Technologies Stormwise (v4.08.01)(formerly known as ICPR4). The 2015 Village of Pinecrest SWMP was utilized as the basis of this analysis, and specific parameter adjustments were made to simulate the Village's future flooding conditions. To achieve this goal, applicable hydrologic and hydraulic input parameters were updated to account for sea-level rise, groundwater rise, increase in rainfall depths, and land use changes throughout the Village.

7.3.2 Topography

The most recent topographic data in the form of a Digital Elevation Model (DEM) was collected for the Village of Pinecrest. This DEM was developed using the latest LiDAR data collected in 2021 by Miami-Dade County's Information Technology Department (ITD). The spatial resolution of the DEM is five (5) foot grid cells that represent the County's bare-earth ground elevation topography. The DEM dataset's vertical control is based on the North American Vertical Datum 1988 (NAVD88). This topographic data was used to determine the flood depth throughout the Village by comparing the flood stages generated by the model against the elevation at that location. **Figure 7-1** includes the elevations throughout the Village.

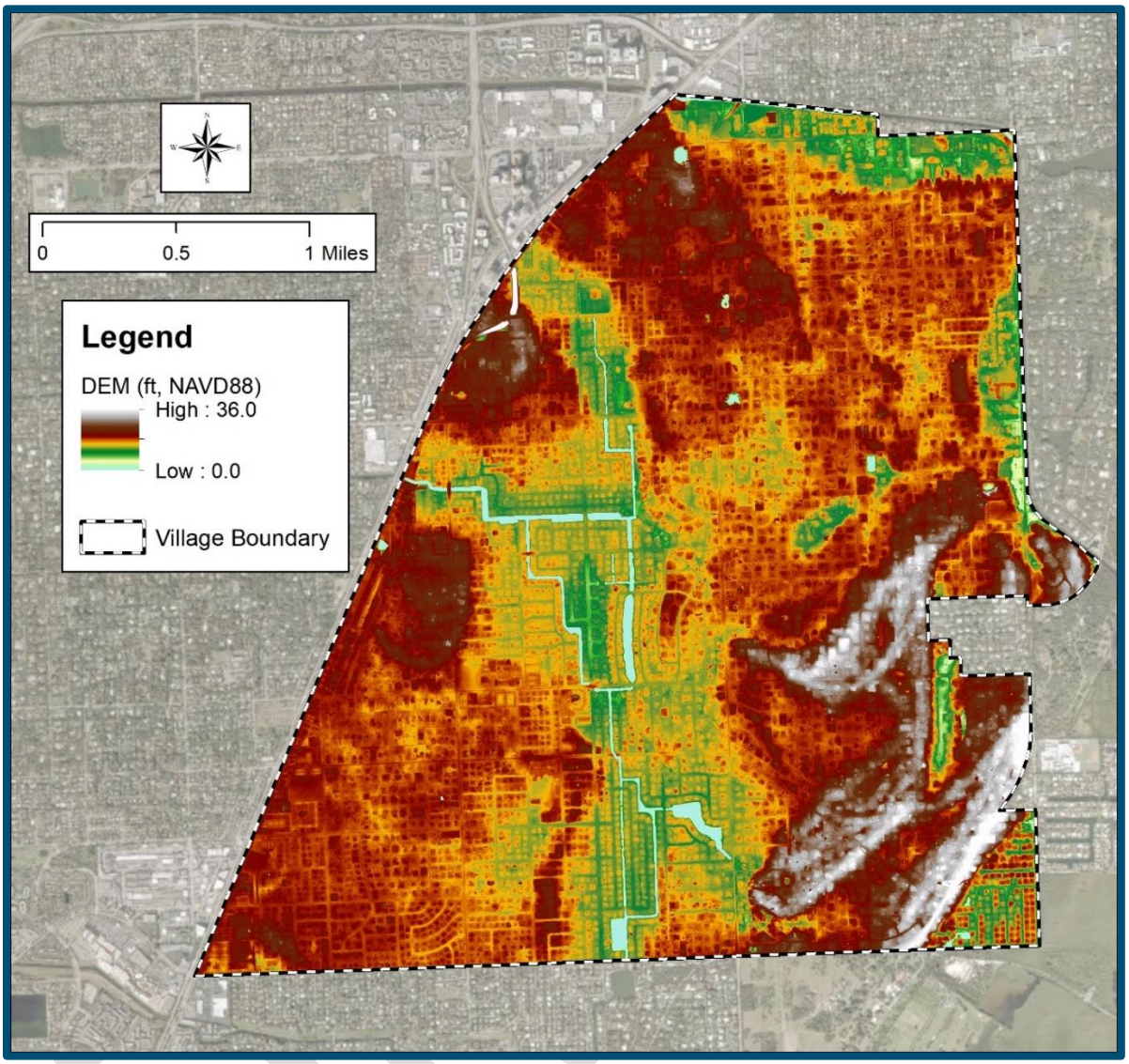


Figure 7-1. Topography within the Village of Pinecrest

7.3.3 Future Soil Zones

The soil zone parameter determines the total amount of rainfall that is anticipated to be infiltrated and stored within the ground. The depth of the water table must be considered throughout the model domain to account for future soil storage. The estimated groundwater rise for the two (2) planning horizons was incorporated into the calculations for an accurate representation of the effect of sea level rise. The design high water table in each scenario was determined by considering the projected sea level for each planning horizon.

Following the SCS approach, the future soil zone in each scenario was generated by subtracting the DHW stage from the 2021 DEM elevations and categorizing them into five (5) different classes (See **Table 7-1**). Four (4) future soil zone data layers were created representing intermediate-low and -high scenarios of the year 2040 and intermediate-low and -high scenarios of the year 2070 as shown in **Table 7-2.** The soil zone data layers were

utilized in the future conditions model development to reflect the soil storage capacity within the Village for the two (2) future planning horizons.

It must be noted that in order to account for the DHW in each scenario, the DEM was manipulated by adjusting the isolated surface water body elevations to account for the future groundwater rise. The task was accomplished by updating the elevation at the surface water bodies to the projected groundwater rise in each planning horizon as shown below:

- The year 2040 intermediate-low projection: 2.33 ft-NAVD88
- The year 2040 intermediate-high projection: 2.75 ft-NAVD88
- The year 2070 intermediate-low projection: 2.88 ft-NAVD88
- The year 2070 intermediate-high projection: 4.62 ft-NAVD88

Table 7-1. Soil Zone Classifications

Soil Zone	Depth (ft-NAVD88)
Zone 1	< 1.0
Zone 2	1.0 to 2.0
Zone 3	2.0 to 3.0
Zone 4	3.0 to 4.0
Zone 5	> 4.0

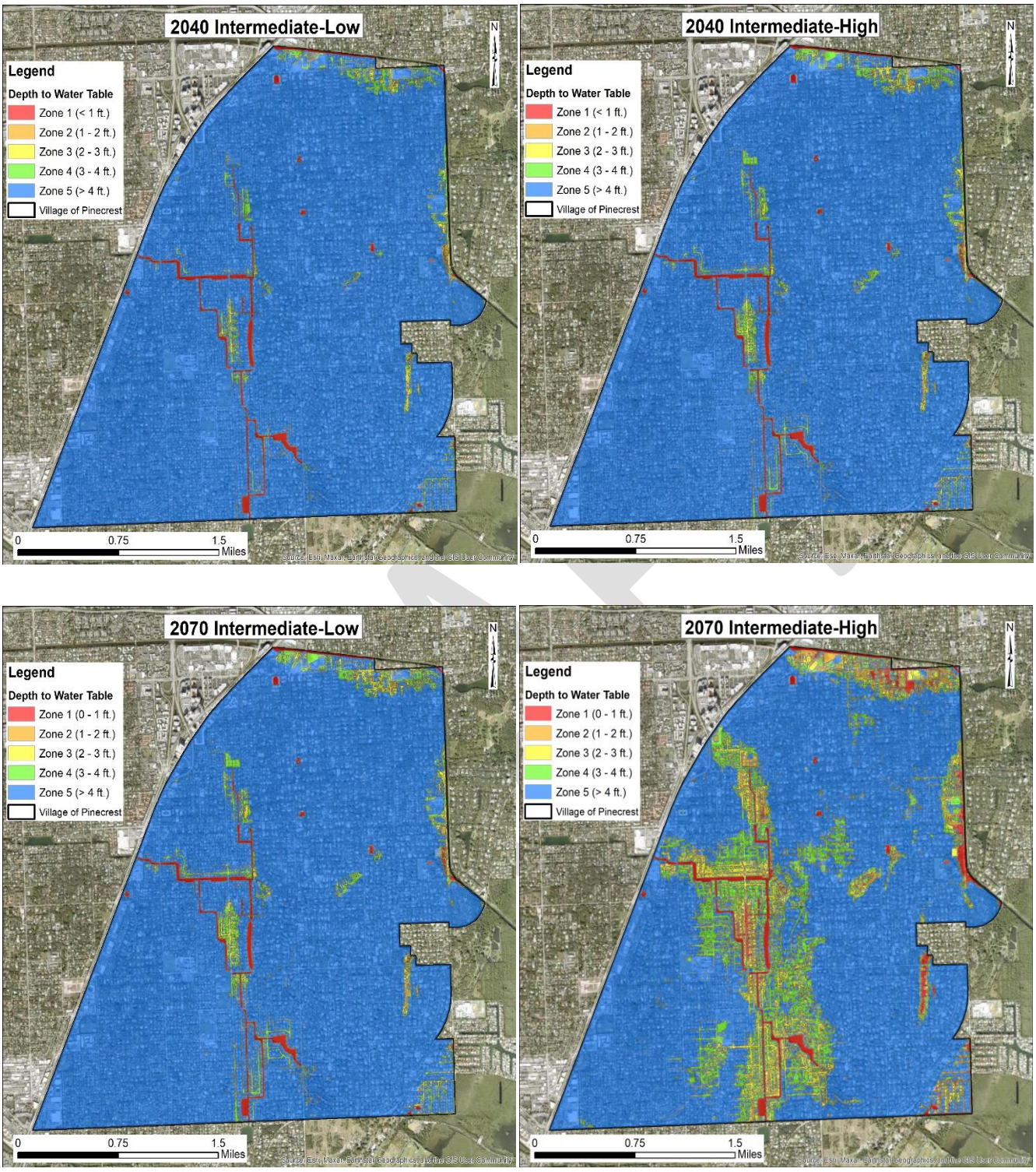


Figure 7-2. Future Soil Zones for the 2040 & 2070 Scenarios

7.3.4 Future Rainfall

The rainfall depth for future conditions was determined based on the FIU's SLSC approach, using the given multiplier values referred to as Change Factors (CFs). Using the CFs, the future rainfall depths were estimated for all design storm events. **Table 7-2** provides the future rainfall depth of the designed storm events. It must be noted that the CF values were generated using linear regression relationships for the 500-YR 72-HR design storm event in this study since FIU has not developed CF values for this design storm event.

Table 7-2. Future Rainfall for the 2040 & 2070 Scenarios

Design Storm Event	2040 Condition Rainfall Depth (in.)	2070 Condition Rainfall Depth (in.)
5-YR 24-HR	7.20	7.40
10-YR 24-HR	8.93	9.25
25-YR 72-HR	13.95	14.21
50-YR 72-HR	16.80	17.10
100-YR 72-HR	19.95	20.48
500-YR 72-HR	29.51	32.36

7.3.5 Future Boundary Conditions

The peak stage hydrographs that were provided by the County for the year 2020 were analyzed and used as input for the boundary conditions in the model by accounting for the projected sea level rise and groundwater rise in each scenario. The projected sea level rise value for the years 2040 and 2070 intermediate-low and intermediate-high planning horizons were directly added to the hydrographs. The Viriginia Key NOAA station was used to obtain the NOAA 2017 SLR information with approval from FDEP. The initial stages of the nodes within the model were also adjusted to the projected groundwater level. **Table 7-3** provides the respective increase of the boundary nodes elevation in each scenario.

Table 7-3. Boundary Conditions Adjustment per Each Scenario

	2040 Intermediate-Low	2040 Intermediate-High	2070 Intermediate-Low	2070 Intermediate-High
Boundary Stages	0.37	0.79	0.92	2.66

7.3.6 Curve Number Values

The South Florida Water Management District (SFWMD) methodology on the soil moisture storage capability (s) was used for estimating runoff volume based on soil types, groundwater levels, land use, and antecedent conditions. Based on this methodology, reference storage values for the coastal compacted soil were used to construct a composite curve number (CN) that captures site-specific storage, while taking impermeable areas

into account. The soil zone was defined in five (5) classes based on the depth of the Seasonal High-Water Table (SHWT). **Table 7-1** includes the soil zone categories and **Table 7-4** provides the applied curve numbers for each land use classification.

Table 7-4. Applied Curve Number to each Land Use Classification

Land Use	CN Zone 1	CN Zone 2	CN Zone 3	CN Zone 4	CN Zone 5
Commercial	99.3	98.3	95.1	91.0	89.1
Parks	95.9	90.0	75.5	61.6	56.3
Residential Multi Family	98.7	96.6	90.7	83.5	80.3
Residential Single Family	98.2	95.5	88.0	79.2	75.3
Roadway	99.8	99.4	98.3	96.8	96.1
Water	100	100	100	100	100

7.3.7 Initial Stages

To account for sea level and groundwater rise, the initial stage elevations of all applicable nodes were adjusted to the future DHW elevation in each scenario.

7.3.8 Storm Surge Boundary Conditions

To accurately assess potential storm surge scenarios, boundary conditions were updated in each modeling scenario to reflect storm surge occurrence. For this purpose, we conducted simulations for the 100-year and 500-year design storm event. The simulations were carried out using data from the National Hurricane Center Storm Surge Risk website and combining it with our two planning horizons. The two categories we focused on are as follows:

- Category 1
- Category 5

Based on this dataset, the Village can experience less than three (3) feet of storm surge for a Category 1 event in most areas. Meanwhile, for a Category 5 event the Village could experience between three (3) and six (6) feet of storm surge for most locations within its limits.

7.4 Exposure Analysis Results

Six (6) different design storm events were selected to evaluate the flooding conditions throughout the Village:

- 5-Year, 24-Hour
- 10-Year, 24-Hour
- 25-Year, 72-Hour
- 50-Year, 72-Hour
- 100-Year, 72-Hour
- 500-Year, 72-Hour

Depth of flooding maps for the entire Village were produced and flood depths were categorized into ten (10) classes to better visualize the extent and severity of flooding on the figures.

7.4.1 Scenario 1: Intermediate-Low Projection (Year 2040)

Flood depth maps for the intermediate-low SLR scenario of the 2040 planning horizon have been generated for the Village and are included in **Appendix D**. These maps present multiple storm events, including 5YR-24HR, 10YR-24HR, 25YR-72HR, 50YR-72HR, 100YR-72HR, and 500YR-72HR.

7.4.2 Scenario 2: Intermediate-High Projection (Year 2040)

Flood depth maps for the intermediate-high SLR scenario of the 2040 planning horizon have been generated for the Village and are included in **Appendix D**. These maps present multiple storm events, including 5YR-24HR, 10YR-24HR, 25YR-72HR, 50YR-72HR, 100YR-72HR, and 500YR-72HR.

7.4.3 Scenario 3: Intermediate-Low Projection (Year 2070)

Flood depth maps for the intermediate-low SLR scenario of the 2070 planning horizon have been generated for the Village and are included in **Appendix D**. These maps present multiple storm events, including 5YR-24HR, 10YR-24HR, 25YR-72HR, 50YR-72HR, 100YR-72HR, and 500YR-72HR.

7.4.4 Scenario 4: Intermediate-High Projection (Year 2070)

Flood depth maps for the intermediate-high SLR scenario of the 2070 planning horizon have been generated for the Village and are included in **Appendix D**. These maps present multiple storm events, including 5YR-24HR, 10YR-24HR, 25YR-72HR, 50YR-72HR, 100YR-72HR, and 500YR-72HR.

7.4.5 Scenario 5: Category 1 Storm Surge Analysis

Flood depth maps for the Category 1 storm surge combined with the 2040 and 2070 planning horizons have been generated for the Village and are included in **Appendix D**. These maps present the 100YR-72HR and 500YR-72HR storm events.

7.4.6 Scenario 6: Category 5 Storm Surge Analysis

Flood depth maps for the Category 5 storm surge combined with the 2040 and 2070 planning horizons have been generated for the Village and are included in **Appendix D**. These maps present the 100YR-72HR and 500YR-72HR storm events.

8.0 Sensitivity Analysis

8.1 Background

Sensitivity refers to how responsive a system is to the impacts of hazards. Conducting a sensitivity analysis allows the planning team and steering committee to pinpoint the land uses, buildings, assets, resources, and populations that could be affected by potential sea level rise, as described in the exposure analysis. Mapping out all entities within the jurisdiction of the Village provides a preliminary understanding of which areas might be impacted. This study involves analyzing assets owned or managed by the Village, such as structures or roads, and assessing how sea level rise could affect them. Multiple GIS datasets, sea level rise projections, and modeling outputs are utilized to determine where inundation might occur and its potential impacts on structures, roads, assets, conservation areas, populations, and other entities.

The goal of the sensitivity analysis is to quantify the impact of flooding on assets, using the results from the exposure analysis and the inventory of critical assets. By incorporating various factors into the sensitivity analysis, such as structural characteristics and asset sensitivity, the planning team can determine the vulnerability. This might involve factors like the length, area, elevation of assets, Finished Floor Elevation (FFE) for buildings, and flood depth for roads. The analysis should assess how different flood severities affect each asset type under various flood scenarios and assign risk levels based on the percentage of inundated land area and the number of critical assets affected.

In this study, sensitivity analysis is conducted to estimate the potential flooding impacts on each asset resulting from sea level rise, groundwater level rise, land development, and rainfall intensity, as well as compound flood scenarios. Specifically, the sensitivity analysis was performed for critical Village assets considering four sea-level rise projections, including NOAA's intermediate-low and intermediate-high projections for the years 2040 and 2070.

8.2 Assets Sensitivity Level Definition

The purpose of the sensitivity analysis method is to assess the impact of future condition factors (such as sea level rise, groundwater rise, rainfall intensity, storm surge) on critical assets and infrastructure according to the Standard Vulnerability Assessment Guidance. This procedure employs a process developed by the Florida Department of Environmental Protection with the Resilient Florida Program known as the standardized vulnerability assessment scope of work guidance. To develop a robust sensitivity analysis for the Village of Pinecrest, all assets and infrastructure were considered based on the expected Level of Service (LOS) which helped the team to define the design storm event associated with each asset. **Table 8-1** provides the complete list of the Village's significant assets and infrastructure, design storm events, and the sensitivity methodology for each asset.

Table 8-1. Sensitivity Assessment Criteria for Village Assets

Main Category	Asset Type	LOS Design Storm Event	Sensitivity Assessment Procedure	Sensitivity Level
Critical Community Emergency Facilities	Community Center	100-Year 72-Hour	Flood depth was compared to the FFE	▪ High: flood depth exceeds FFE ▪ Medium: flood depth between 0 - 0.5 ft below FFE ▪ Low: flood depth more than 0.5 ft below FFE
	Fire Station	100-Year 72-Hour	Flood depth was compared to the FFE	
	Police Stations	100-Year 72-Hour	Flood depth was compared to the FFE	
	Public Library	100-Year 72-Hour	Flood depth was compared to the FFE	
	Public Works Department	100-Year 72-Hour	Flood depth was compared to the FFE	
	Village Hall	100-Year 72-Hour	Flood depth was compared to the FFE	
Transportation Assets and Evacuation Routes	Village Evacuation Route	10-Year 24-Hour	Depth & extent of flooding over the roadway	▪ High: mean flood depth > 0.5 ft above crown of roadway ▪ Medium: mean flood depth between 0.25 - 0.5 ft above crown of roadway ▪ Low: mean flood depth < 0.25 ft above crown of roadway
	Village Primary Major Road	10-Year 24-Hour	Depth & extent of flooding over the roadway	
Critical Infrastructure	Culverts Crossing Village Roads	50-Year 72-Hour	Flood depth was compared to the top of the structure	▪ High: flood depth > 0.5 ft ▪ Medium: flood depth, 0 - 0.5 ft ▪ Low: flood depth ≤ 0
	Outfalls	10-Year 24-Hour	Flood depth was assessed at service roadways	
Natural, Cultural, and Historical Resources	Parks	100-Year 72-Hour	Percentage of flooding area was examined	▪ High: > 66% of lot area is flooded ▪ Medium: 33% to 66% of lot area is flooded ▪ Low: < 33% of lot area is flooded

The sensitivity analysis and the flood level of service associated to each asset is explained as follow:

- All critical community and emergency facility buildings should be flood-free during the 100-Year 72-Hour design storm event.
- Evacuation routes should be passable during the 10-Year 24-Hour design storm event.
- Primary major roads should be passable during the 10-Year 24-Hour design storm event.
- The culvert crossings should not overtop during the 50-Year 72-Hour design storm event.
- The outfalls should provide service for the upstream roadways during the 10-Year 24-Hour design storm event.
- Parks should be flood free during the 100-Year 72-Hour design storm events.

Three (3) levels of sensitivity have been defined for the critical assets: “High”, “Medium”, and “Low”. To assess the buildings, a high sensitivity level is defined as flood exceeding FFE while a medium sensitivity is when the flood elevation varies between 0 to 0.5 ft. below FFE. On the other hand, if flood stage elevation is more than 0.5 ft. below FFE, then the asset is classified in the low sensitivity category (See **Table 8-1**). For ease of visualization, the sensitivity levels are represented in three (3) colors:

- Red: High sensitivity
- Yellow: Medium sensitivity
- Green: Low sensitivity

The sensitivity analysis for roadways routes was defined by the depth and extent of the inundation over the roadways. To define the average depth of flood in each roadway, depth of flooding and the extent of the inundation were calculated in the GIS environment and categorized in four (4) classes:

- < 0.25 ft.
- 0.25 ft. to 0.5 ft.
- 0.5 ft. to 1.0 ft.
- > 1.0 ft.

The average depth of flood in each roadway is calculated with the following equation:

$$Average\ Depth\ of\ Flood = \frac{(0.12 \times l_1) + (0.35 \times l_2) + (0.75 \times l_3) + (1 \times l_4)}{L}$$

Where:

l_1 is the length of roadway with flood depth of 0.25 ft. or lower.

l_2 is the length of roadway with flood depth ranging from 0.25 ft. to 0.5 ft.

l_3 is the length of roadway with flood depth ranging from 0.5 ft. to 1.0 ft.

l_4 is the length of roadway with flood depth greater than 1.0 ft.

L representing the total length of roadway.

The multipliers are the average depth of flood for each class.

The sensitivity analysis was completed using the methods previously described to measure the sensitivity of each asset to flooding caused by future sea level rise, groundwater rise, rainfall intensity, and storm surge. The results of the analysis were represented in table or map formats and are discussed in the following section.

8.3 Sensitivity Analysis Results

The sensitivity analysis was completed for all critical assets identified within Village limits based on the exposure analysis results for four (4) different sea level rise projections. The impacts of flooding (sensitivity analysis) on the assets were tabulated, color coded, and mapped for each SLR scenario to help better visualize the extent and severity of flooding on each asset.

8.3.1 Critical Community and Emergency Facilities

The critical community and emergency facilities in the Village are composed of one (1) Community Center, one (1) Public Library, one (1) Village Hall, one (1) Police Station, one (1) Fire Station, and one (1) Public Works Department. These facilities were selected based on their significance to the local government and the community. The sensitivity analysis was completed for four (4) SLR projections in two (2) planning horizons (year 2040 and year 2070). The compound flooding scenarios were also analyzed by including storm surge data for Category 1 and Category 5 hurricanes. Detailed analysis and findings for sea-level rise scenarios and storm surge modeling conditions are presented in the following subsections.

8.3.1.1 Sea-Level Rise Scenarios

The sensitivity analysis for the Critical Community and Emergency Facilities in sea-level rise scenarios was determined based on the use of received or estimated FFE and the maximum flood depth during the 100-YR, 72-HR storm events. Assessing whether a building would be inundated during a 100-YR storm event required analyzing the FFE. The Village provided structure elevation for some assets and for those that the information wasn't available an estimation process was used. The estimation process consisted of extracting the elevation from the DEM nearest to the adjacent crown of the road or the highest edge of roadway cross-section, with an additional eight (8) inches added, which is consistent with the County's Code of Ordinances.

Buildings and structures were represented as point shapefiles and superimposed onto the 100-YR, 72-HR peak stage elevation raster data layers. This provided the highest water elevation at each structure for sea-level rise scenarios. Finally, a comparative analysis was performed to determine if a structure is likely to flood and to what extent. **Table 8-2** presents the comparison between each structure's FFE and the maximum flood elevation at the asset location. The color-coded scheme used in the table serves as a visual representation of the varying degrees of flooding impact on these assets, following the criteria previously defined.

Table 8-2. Sensitivity Analysis of Critical Community Emergency Facilities in Sea-Level Rise Scenarios

Village Buildings		FFE (ft-NAVD88)	Flood Stage (ft.)				Sensitivity Assessment, (Flood Stage – FFE) (ft.)			
Asset Name	Address		2040 IL*	2040 IH*	2070 IL*	2070 IH*	2040 IL*	2040 IH*	2070 IL*	2070 IH*
Pinecrest Community Center	5855 SW 111TH ST	12.38	7.80	7.85	7.87	8.98	-4.58	-4.53	-4.51	-3.4
Pinecrest Public Library	5855 SW 111TH ST	10.05	7.80	7.85	7.87	8.98	-2.25	-2.20	-2.18	-1.07
Village Hall	12645 Pinecrest Parkway	10.80	10.60	10.63	10.66	10.69	-0.20	-0.17	-0.14	-0.11
Pinecrest Police Station	12645 S Dixie Highway	10.76	10.60	10.63	10.66	10.69	-0.16	-0.13	-0.10	-0.07
Pinecrest Fire & Rescue Station	10850 SW 57th Avenue	4.98	7.80	7.85	7.87	8.98	2.82	2.87	2.89	4.00
Pinecrest Public Works Department	10800 SW 57th Avenue	10.00	7.80	7.85	7.87	8.98	-2.20	-2.15	-2.13	-1.02
						Legend	High	Medium		Low

* Note: "IL" and "IH" indicate intermediate-low and intermediate-high, respectively. In addition, negative values indicate flooding depth below the FFE.

The outcomes of the sensitivity analysis concerning critical community facilities indicate that the Community Center, Public Library, and Public Works Department exhibit low sensitivity across all modeled scenarios. The Village Hall and Police Station demonstrate moderate sensitivity to flooding. Finally, the Pinecrest Fire & Rescue station displays a high sensitivity to flooding, experiencing an average flood depth above the Finished Floor Elevation of 3.14 feet.

8.3.1.2 Storm Surge Modeling

The storm surge analysis considers the impacts of a Category 1 or Category 5 hurricane when combined with the sea-level rise scenarios. As discussed in previous sections, the storm surge data was obtained from the National Hurricane Center Storm Surge Risk website. The comparative analysis was performed using the FFE for buildings and the peak stage elevation generated by the storm surge compound flooding scenario. **Table 8-3** and **Table 8-4** provide the results of the sensitivity analysis for the Category 1 and Category 5 scenarios.

Table 8-3. Sensitivity Analysis of Critical Community Emergency Facilities in Category 1 Storm Surge Scenarios

Village Buildings		FFE (ft-NAVD88)	Flood Stage (ft.)				Sensitivity Assessment, (Flood Stage – FFE) (ft.)			
Asset Name	Address		2040 IL*	2040 IH*	2070 IL*	2070 IH*	2040 IL*	2040 IH*	2070 IL*	2070 IH*
Pinecrest Community Center	5855 SW 111TH ST	12.38	9.61	10.05	10.11	12.12	-2.77	-2.33	-2.27	-0.26
Pinecrest Public Library	5855 SW 111TH ST	10.05	9.61	10.05	10.11	12.12	-0.44	0.00	0.06	2.07
Village Hall	12645 Pinecrest Parkway	10.80	11.09	11.45	11.57	13.29	0.29	0.65	0.77	2.49
Pinecrest Police Station	12645 S Dixie Highway	10.76	11.09	11.46	11.58	13.29	0.33	0.70	0.82	2.53
Pinecrest Fire & Rescue Station	10850 SW 57th Avenue	4.98	9.61	10.05	10.11	12.12	4.63	5.07	5.13	7.14
Pinecrest Public Works Department	10800 SW 57th Avenue	10.00	9.61	10.05	10.11	12.12	-0.39	0.05	0.11	2.12
							Legend	High	Medium	Low

* Note: “IL” and “IH” indicate intermediate-low and intermediate-high, respectively. In addition, negative values indicate flooding depth below the FFE.

Table 8-4. Sensitivity Analysis of Critical Community Emergency Facilities in Category 5 Storm Surge Scenarios

Village Buildings		FFE (ft-NAVD88)	Flood Stage (ft.)				Sensitivity Assessment, (Flood Stage – FFE) (ft.)			
Asset Name	Address		2040 IL*	2040 IH*	2070 IL*	2070 IH*	2040 IL*	2040 IH*	2070 IL*	2070 IH*
Pinecrest Community Center	5855 SW 111TH ST	12.38	12.83	13.24	13.14	15.09	0.45	0.86	0.76	2.71
Pinecrest Public Library	5855 SW 111TH ST	10.05	12.83	13.24	13.14	15.09	2.78	3.19	3.09	5.04
Village Hall	12645 Pinecrest Parkway	10.80	14.00	14.42	14.55	16.28	3.20	3.62	3.75	5.48
Pinecrest Police Station	12645 S Dixie Highway	10.76	14.00	14.42	14.55	16.28	3.24	3.66	3.79	5.52

Village Buildings		FFE (ft-NAVD88)	Flood Stage (ft.)				Sensitivity Assessment, (Flood Stage – FFE) (ft.)			
Asset Name	Address		2040 IL*	2040 IH*	2070 IL*	2070 IH*	2040 IL*	2040 IH*	2070 IL*	2070 IH*
Pinecrest Fire & Rescue Station	10850 SW 57th Avenue	4.98	12.83	13.24	13.34	15.09	7.85	8.26	8.36	10.11
Pinecrest Public Works Department	10800 SW 57th Avenue	10.00	12.83	13.24	13.34	15.09	2.83	3.24	3.34	5.09
						Legend	High	Medium		Low

* Note: "IL" and "IH" indicate intermediate-low and intermediate-high, respectively. In addition, negative values indicate flooding depth below the FFE.

The findings from the Category 1 storm surge compound flooding scenario indicate that the Community Center exhibits low sensibility to flooding across all modeling scenarios, with an average flood depth of 1.90 feet below FFE. Conversely, other assets demonstrate a high vulnerability to flooding, notably the Fire and Rescue Station located at 10850 SW 57th Ave. On the other hand, during the Category 5 storm surge analysis, all assets display high sensitivity to flooding across all modeling scenarios.

8.3.2 Transportation Assets and Evacuation Routes

The Village's transportation assets and evacuation routes comprise ten (10) designated evacuation routes and six (6) primary major roads, which were identified and classified as essential components of the critical asset inventory. These roads were categorized based on their significance within the Village and evaluated according to their capacity to ensure the safe movement of residents. The sensitivity analysis of these transportation assets and evacuation routes was conducted across four (4) projections of Sea Level Rise (SLR) for the planning horizons of both the year 2040 and 2070. To conduct this analysis, the depth and extent of inundation over the roadways/routes were computed. The anticipated Level of Service (LOS) for each asset and the considered design storm events are further elaborated in the following section.

8.3.3 Evacuation Routes

The evacuation routes are classified as roadways that the community can use to safely exit an area during emergencies, including natural disasters like flooding. Within the Village, a total of ten (10) evacuation routes were identified, including SW 88th St, SW 67th Ave, SW 57th Ave, SW 136th St, SW 77th St, SW 104th St, Old Cutler Rd, SW 112th St, S Dixie Hwy, SW 124th St. The percentage of inundation was calculated and classified based on the flood depth as follows:

- Less than 0.25 ft. (3 inches)
- Between 0.5 to 0.5 ft. (3 to 6 inches)
- Greater than 0.5 ft. (6 inches)

8.3.3.1 Sea-Level Rise Scenarios

To evaluate the potential impact of sea-level rise on evacuation routes, a sensitivity analysis was performed using the results from the exposure analysis for the 10-YR, 24-HR design storm event. The average flood depth was computed in accordance with the parameters described in **Table 8-1**. The total length of the evacuation route, the percentage of its length inundated, and the calculated average flood depth for the different sea-level rise scenarios is presented in **Table 8-5**. Sensitivity analysis maps for the designated planning horizons are included in **Appendix E**.

Table 8-5. Sensitivity Analysis of the Evacuation Routes in Sea-Level Rise Scenarios

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 88TH ST	2040 Int-Low	1.49	49.67%	3.38%	46.95%	0.53
	2040 Int-High	1.49	49.67%	3.38%	46.95%	0.53
	2070 Int-Low	1.49	50.48%	3.38%	46.14%	0.52
	2070 Int-High	1.49	49.60%	3.24%	47.17%	0.53
SW 67TH AVE	2040 Int-Low	2.04	71.58%	5.56%	22.86%	0.32
	2040 Int-High	2.04	71.63%	5.51%	22.87%	0.32
	2070 Int-Low	2.04	71.65%	5.48%	22.87%	0.32
	2070 Int-High	2.04	71.33%	5.01%	23.66%	0.33
SW 57TH AVE	2040 Int-Low	3.25	42.73%	1.12%	56.15%	0.61
	2040 Int-High	3.25	42.73%	1.12%	56.15%	0.61
	2070 Int-Low	3.25	42.83%	1.33%	55.83%	0.61
	2070 Int-High	3.25	42.62%	1.12%	56.26%	0.61
SW 136TH ST	2040 Int-Low	1.78	59.63%	2.54%	37.83%	0.44
	2040 Int-High	1.78	59.63%	2.54%	37.83%	0.44
	2070 Int-Low	1.78	59.63%	2.54%	37.83%	0.44
	2070 Int-High	1.78	59.55%	2.54%	37.90%	0.44
SW 77TH ST	2040 Int-Low	2.69	77.76%	6.19%	16.05%	0.26
	2040 Int-High	2.69	77.76%	6.19%	16.05%	0.26

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
	2070 Int-Low	2.69	77.76%	6.19%	16.05%	0.26
	2070 Int-High	2.69	77.76%	6.19%	16.05%	0.26
SW 104TH ST	2040 Int-Low	2.66	85.06%	1.94%	13.00%	0.23
	2040 Int-High	2.66	85.42%	1.53%	13.06%	0.23
	2070 Int-Low	2.66	85.42%	1.19%	13.40%	0.23
	2070 Int-High	2.66	85.04%	0.81%	14.16%	0.24
OLD CUTLER RD	2040 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2040 Int-High	2.48	100.00%	0.00%	0.00%	0.12
	2070 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2070 Int-High	2.48	100.00%	0.00%	0.00%	0.12
SW 112TH ST	2040 Int-Low	2.24	80.79%	5.26%	13.95%	0.22
	2040 Int-High	2.24	81.34%	4.41%	14.24%	0.23
	2070 Int-Low	2.24	81.07%	4.45%	14.47%	0.24
	2070 Int-High	2.24	72.51%	8.48%	19.00%	0.28
S DIXIE HWY	2040 Int-Low	3.8	99.89%	0.11%	0.00%	0.12
	2040 Int-High	3.8	99.89%	0.11%	0.00%	0.12
	2070 Int-Low	3.8	99.89%	0.11%	0.00%	0.12
	2070 Int-High	3.8	99.89%	0.11%	0.00%	0.12
SW 124TH ST	2040 Int-Low	0.61	49.80%	13.16%	37.04%	0.43
	2040 Int-High	0.61	49.83%	13.10%	37.06%	0.43
	2070 Int-Low	0.61	49.80%	13.14%	37.06%	0.43
	2070 Int-High	0.61	49.58%	12.62%	37.80%	0.43
			Legend	High	Medium	Low

The results of the sensitivity assessment for evacuation routes under the sea level rise scenarios reveal that SW 104th St, Old Cutler Road, SW 112th St, and S Dixie Hwy exhibit low vulnerability to flooding. SW 67th St, SW 136th St, SW 77th St, and SW 124th St demonstrate a medium susceptibility to flooding. Conversely, SW 88th St and SW 57th Ave show a high sensitivity to flooding, with average flood depths of 0.53 feet and 0.61 feet respectively.

8.3.3.2 Storm Surge Modeling

To assess the potential impacts of storm surge impacts on evacuation routes, a sensitivity analysis was performed using the results obtained from the exposure analysis of Category 1 and Category 5 storm surge

events for the selected design storm. The average flood depth was computed as the sensitivity parameters and color coded in accordance with **Table 8-1**. The results for the storm surge scenarios are included in **Table 8-6** and **Table 8-7**. Sensitivity analysis maps are provided in **Appendix E** for Category 1 and Category 5 scenarios. These maps provide a visual representation of how the flood depth changes for each road segment.

Table 8-6. Sensitivity Analysis of Evacuation Routes under the Category 1 Storm Surge Conditions

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 88TH ST	2040 Int-Low	1.49	49.13%	3.21%	47.67%	0.53
	2040 Int-High	1.49	48.64%	3.24%	48.12%	0.54
	2070 Int-Low	1.49	48.64%	3.24%	48.12%	0.54
	2070 Int-High	1.49	47.53%	3.68%	48.79%	0.55
SW 67TH AVE	2040 Int-Low	2.04	70.28%	4.98%	24.74%	0.33
	2040 Int-High	2.04	70.25%	4.89%	24.86%	0.34
	2070 Int-Low	2.04	70.04%	4.57%	25.39%	0.34
	2070 Int-High	2.04	69.72%	4.63%	25.65%	0.34
SW 57TH AVE	2040 Int-Low	3.25	41.43%	1.74%	56.83%	0.62
	2040 Int-High	3.25	41.61%	0.96%	57.43%	0.62
	2070 Int-Low	3.25	41.45%	1.12%	57.43%	0.62
	2070 Int-High	3.25	41.34%	0.85%	57.81%	0.62
SW 136TH ST	2040 Int-Low	1.78	59.20%	2.68%	38.12%	0.44
	2040 Int-High	1.78	57.79%	4.03%	38.18%	0.44
	2070 Int-Low	1.78	56.23%	4.98%	38.78%	0.45
	2070 Int-High	1.78	56.23%	4.98%	38.78%	0.45
SW 77TH ST	2040 Int-Low	2.69	77.76%	6.19%	16.05%	0.26
	2040 Int-High	2.69	77.62%	6.33%	16.05%	0.26
	2070 Int-Low	2.69	76.78%	7.07%	16.15%	0.26
	2070 Int-High	2.69	76.78%	7.07%	16.15%	0.26
SW 104TH ST	2040 Int-Low	2.66	84.84%	0.72%	14.44%	0.24
	2040 Int-High	2.66	84.82%	0.72%	14.46%	0.24
	2070 Int-Low	2.66	84.78%	0.64%	14.58%	0.24
	2070 Int-High	2.66	84.78%	0.59%	14.62%	0.24
	2040 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2040 Int-High	2.48	100.00%	0.00%	0.00%	0.12

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
OLD CUTLER RD	2070 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2070 Int-High	2.48	100.00%	0.00%	0.00%	0.12
SW 112TH ST	2040 Int-Low	2.24	63.66%	8.46%	27.88%	0.32
	2040 Int-High	2.24	66.33%	4.45%	29.21%	0.34
	2070 Int-Low	2.24	66.18%	3.22%	30.60%	0.35
	2070 Int-High	2.24	66.07%	3.26%	30.67%	0.35
S DIXIW HWY	2040 Int-Low	3.8	99.86%	0.11%	0.03%	0.12
	2040 Int-High	3.8	99.86%	0.11%	0.03%	0.12
	2070 Int-Low	3.8	99.84%	0.14%	0.03%	0.12
	2070 Int-High	3.8	99.84%	0.14%	0.03%	0.12
SW 124TH ST	2040 Int-Low	0.61	49.54%	12.51%	37.94%	0.44
	2040 Int-High	0.61	49.43%	12.62%	37.94%	0.44
	2070 Int-Low	0.61	48.84%	11.96%	39.19%	0.44
	2070 Int-High	0.61	48.84%	11.96%	39.19%	0.44
			Legend	High	Medium	Low

Table 8-7. Sensitivity Analysis of Evacuation Routes under Category 5 Storm Surge Conditions

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 88TH ST	2040 Int-Low	1.49	19.50%	0.44%	80.06%	0.82
	2040 Int-High	1.49	18.91%	0.44%	80.65%	0.83
	2070 Int-Low	1.49	18.69%	0.29%	81.02%	0.83
	2070 Int-High	1.49	7.06%	3.68%	89.26%	0.90
SW 67TH AVE	2040 Int-Low	2.04	44.63%	5.82%	49.56%	0.50
	2040 Int-High	2.04	37.54%	8.32%	54.14%	0.58
	2070 Int-Low	2.04	33.67%	9.84%	56.49%	0.61
	2070 Int-High	2.04	3.54%	0.41%	96.05%	0.95
SW 57TH AVE	2040 Int-Low	3.25	24.02%	0.88%	75.09%	0.76
	2040 Int-High	3.25	19.45%	3.62%	76.93%	0.80
	2070 Int-Low	3.25	18.33%	3.89%	77.78%	0.80

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
	2070 Int-High	3.25	6.07%	1.23%	92.70%	0.93
SW 136TH ST	2040 Int-Low	1.78	44.47%	4.60%	50.93%	0.54
	2040 Int-High	1.78	42.03%	5.93%	52.03%	0.56
	2070 Int-Low	1.78	40.76%	5.76%	53.48%	0.57
	2070 Int-High	1.78	26.56%	1.66%	71.78%	0.74
SW 77TH ST	2040 Int-Low	2.69	58.70%	9.33%	31.97%	0.37
	2040 Int-High	2.69	52.12%	14.38%	33.50%	0.42
	2070 Int-Low	2.69	48.21%	15.26%	36.53%	0.44
	2070 Int-High	2.69	20.29%	0.84%	78.87%	0.80
SW 104TH ST	2040 Int-Low	2.66	42.85%	8.35%	48.80%	0.47
	2040 Int-High	2.66	33.53%	9.50%	56.97%	0.59
	2070 Int-Low	2.66	31.37%	9.11%	59.52%	0.61
	2070 Int-High	2.66	0.00%	0.97%	99.03%	0.98
OLD CUTLER RD	2040 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2040 Int-High	2.48	100.00%	0.00%	0.00%	0.12
	2070 Int-Low	2.48	100.00%	0.00%	0.00%	0.12
	2070 Int-High	2.48	100.00%	0.00%	0.00%	0.12
SW 112TH ST	2040 Int-Low	2.24	38.18%	7.89%	53.93%	0.54
	2040 Int-High	2.24	34.40%	5.26%	60.35%	0.62
	2070 Int-Low	2.24	31.79%	5.53%	62.69%	0.65
	2070 Int-High	2.24	22.69%	1.42%	75.89%	0.78
S DIXIW HWY	2040 Int-Low	3.8	90.06%	3.34%	6.60%	0.13
	2040 Int-High	3.8	87.07%	5.87%	7.07%	0.18
	2070 Int-Low	3.8	86.74%	3.71%	9.55%	0.19
	2070 Int-High	3.8	59.43%	7.75%	32.82%	0.40
SW 124TH ST	2040 Int-Low	0.61	40.09%	10.54%	49.37%	0.53
	2040 Int-High	0.61	39.82%	9.83%	50.35%	0.54
	2070 Int-Low	0.61	38.50%	10.13%	51.38%	0.55
	2070 Int-High	0.61	22.13%	1.83%	76.04%	0.76
			Legend	High	Medium	Low

The sensitivity analysis findings for Category 1 closely resemble those of the sea-level rise scenarios, with the sole discrepancy being that SW 112th St transitions to a medium sensitivity to flooding in the storm surge

scenario. Conversely, in the Category 5 scenario, most roads exhibit a high sensitivity to flooding, except for SW 77th St, Old Cutler Rd, and S Dixie Hwy.

8.3.4 Primary Roads

The primary roads were categorized as roadways that lead to evacuation routes. A total of six (6) primary roads were identified within the Village limits, including SW 128th St, SW 82nd Ave, SW 62nd Ave, SW 96th St, SW 72nd St, and SW 120th St. The percentage of inundation was calculated using road length and classified based on flood depth as follows:

- Less than 0.25 ft. (3 inches)
- Between 0.5 to 0.5 ft. (3 to 6 inches)
- Greater than 0.5 ft. (6 inches)

8.3.4.1 Sea-Level Rise Scenarios

To quantify the impact of sea level rise on the primary roads, a sensitivity analysis was performed using the results of the exposure analysis for the 10-YR, 24-HR design storm events. The computed average flood depth was utilized as the sensitivity parameter and color coded as described in **Table 8-1**. The results of the analysis are provided in **Table 8-8** and the corresponding flood maps are included in **Appendix E**.

Table 8-8. Sensitivity Analysis of Primary Roads in Sea-Level Rise Scenarios

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 128TH ST	2040 Int-Low	1.35	5.90%	7.45%	86.65%	0.85
	2040 Int-High	1.35	5.90%	7.45%	86.65%	0.85
	2070 Int-Low	1.35	5.90%	7.45%	86.65%	0.85
	2070 Int-High	1.35	5.90%	7.45%	86.65%	0.85
SW 82nd AVE	2040 Int-Low	1.02	1.57%	11.30%	87.13%	0.81
	2040 Int-High	1.02	1.57%	11.30%	87.13%	0.81
	2070 Int-Low	1.02	1.57%	11.30%	87.13%	0.81
	2070 Int-High	1.02	1.57%	11.30%	87.13%	0.81
SW 62ND AVE	2040 Int-Low	2.04	98.98%	0.70%	0.33%	0.12
	2040 Int-High	2.04	98.98%	0.70%	0.33%	0.12

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
	2070 Int-Low	2.04	98.98%	0.70%	0.33%	0.12
	2070 Int-High	2.04	98.98%	0.70%	0.33%	0.12
SW 96TH ST	2040 Int-Low	1.84	82.39%	0.26%	17.35%	0.27
	2040 Int-High	1.84	82.39%	0.26%	17.35%	0.27
	2070 Int-Low	1.84	82.39%	0.26%	17.35%	0.27
	2070 Int-High	1.84	82.39%	0.15%	17.46%	0.27
SW 72ND ST	2040 Int-Low	2.93	23.94%	3.16%	72.90%	0.74
	2040 Int-High	2.93	23.67%	2.13%	74.20%	0.76
	2070 Int-Low	2.93	23.57%	1.74%	74.69%	0.76
	2070 Int-High	2.93	17.99%	3.25%	78.76%	0.80
SW 120TH ST	2040 Int-Low	2.7	41.99%	0.97%	57.03%	0.61
	2040 Int-High	2.7	42.01%	0.94%	57.05%	0.61
	2070 Int-Low	2.7	42.01%	0.94%	57.05%	0.61
	2070 Int-High	2.7	40.69%	1.83%	57.48%	0.61
			Legend	High	Medium	Low

The outcomes of the sensitivity analysis for the primary roads reveal that one (1) road was categorized as having low sensitivity to flooding, one (1) as having medium sensitivity, and four (4) as having high sensitivity. The highest sensitivity to flooding was identified in SW 128th St and SW 82nd Ave with an average depth of flood of 0.85 feet and 0.81 feet respectively.

8.3.4.2 Storm Surge Modeling

The impacts of storm surge on primary roads were analyzed using the results obtained from the exposure analysis of Category 1 and Category 5 storm surge events during the selected design storm event. The average flood depth was computed as the sensitivity parameter and classified as described in **Table 8-1.** The total length of the primary road, the corresponding percentage of inundation and sensitivity levels under storm surge conditions are presented in **Table 8-9** and **Table 8-10**. Maps describing the flooding depth at each segment of the primary roads are included in **Appendix E**.

Table 8-9. Sensitivity Analysis of Primary Roads under Category 1 Storm Surge Scenarios

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 128TH ST	2040 Int-Low	1.35	5.89%	7.44%	86.67%	0.85
	2040 Int-High	1.35	5.90%	7.31%	86.79%	0.85
	2070 Int-Low	1.35	5.90%	6.47%	87.63%	0.85
	2070 Int-High	1.35	5.90%	6.47%	87.63%	0.85
SW 82nd AVE	2040 Int-Low	1.02	1.57%	11.30%	87.13%	0.81
	2040 Int-High	1.02	1.57%	11.30%	87.13%	0.81
	2070 Int-Low	1.02	1.48%	10.46%	88.06%	0.82
	2070 Int-High	1.02	1.48%	10.46%	88.06%	0.82
SW 62ND AVE	2040 Int-Low	2.04	98.98%	0.70%	0.33%	0.12
	2040 Int-High	2.04	98.98%	0.70%	0.33%	0.12
	2070 Int-Low	2.04	98.84%	0.79%	0.37%	0.12
	2070 Int-High	2.04	98.84%	0.79%	0.37%	0.12
SW 96TH ST	2040 Int-Low	1.84	82.34%	0.21%	17.46%	0.27
	2040 Int-High	1.84	82.23%	0.31%	17.46%	0.27
	2070 Int-Low	1.84	82.03%	0.46%	17.51%	0.27
	2070 Int-High	1.84	81.98%	0.51%	17.51%	0.27
SW 72ND ST	2040 Int-Low	2.93	16.38%	2.24%	81.37%	0.81
	2040 Int-High	2.93	12.93%	3.74%	83.32%	0.83
	2070 Int-Low	2.93	12.57%	1.61%	85.82%	0.85
	2070 Int-High	2.93	12.57%	1.58%	85.85%	0.85
SW 120TH ST	2040 Int-Low	2.7	37.14%	2.76%	60.11%	0.63
	2040 Int-High	2.7	36.91%	1.91%	61.18%	0.64
	2070 Int-Low	2.7	36.75%	1.21%	62.04%	0.64
	2070 Int-High	2.7	36.71%	1.25%	62.04%	0.64
			Legend	High	Medium	Low

Table 8-10. Sensitivity Analysis of Primary Roads under Category 5 Storm Surge Scenarios

Asset Name	Scenario	Total Length (Miles)	% Length of Road, Flooded Depth (< 0.25 ft.)	% Length of Road, Flooded Depth (0.25 – 0.5 ft.)	% Length of Road, Flooded Depth (> 0. 5 ft.)	Sensitivity Assessment, Mean Flood Depth (ft.)
SW 128TH ST	2040 Int-Low	1.35	4.76%	7.48%	87.76%	0.86
	2040 Int-High	1.35	4.57%	7.24%	88.19%	0.86
	2070 Int-Low	1.35	4.15%	6.89%	88.97%	0.87
	2070 Int-High	1.35	0.14%	0.14%	99.72%	0.98
SW 82nd AVE	2040 Int-Low	1.02	1.57%	11.30%	87.13%	0.81
	2040 Int-High	1.02	1.57%	11.30%	87.13%	0.81
	2070 Int-Low	1.02	1.48%	10.46%	88.06%	0.82
	2070 Int-High	1.02	0.09%	0.09%	99.81%	0.97
SW 62ND AVE	2040 Int-Low	2.04	78.46%	3.92%	17.62%	0.21
	2040 Int-High	2.04	72.67%	8.47%	18.85%	0.28
	2070 Int-Low	2.04	67.97%	8.19%	23.84%	0.32
	2070 Int-High	2.04	53.35%	2.19%	44.46%	0.50
SW 96TH ST	2040 Int-Low	1.84	44.73%	11.13%	44.14%	0.40
	2040 Int-High	1.84	34.04%	11.43%	54.53%	0.56
	2070 Int-Low	1.84	32.34%	10.09%	57.57%	0.58
	2070 Int-High	1.84	0.31%	3.55%	96.14%	0.96
SW 72ND ST	2040 Int-Low	2.93	8.61%	0.78%	90.61%	0.91
	2040 Int-High	2.93	7.98%	0.46%	91.56%	0.92
	2070 Int-Low	2.93	7.85%	0.49%	91.66%	0.92
	2070 Int-High	2.93	1.87%	0.46%	97.67%	0.97
SW 120TH ST	2040 Int-Low	2.7	32.86%	1.34%	65.80%	0.68
	2040 Int-High	2.7	30.67%	2.46%	66.87%	0.69
	2070 Int-Low	2.7	29.46%	2.30%	68.24%	0.70
	2070 Int-High	2.7	22.14%	0.58%	77.28%	0.80
			Legend	High	Medium	Low

The sensitivity analysis outcomes for primary roads indicate a consistent sensitivity among assets under Category 1 and sea level rise scenarios. However, during the Category 5 storm surge event, all primary roads exhibit a high sensitivity level across all flooding scenarios, except for SW 62nd Ave.

8.3.5 Critical Infrastructure

The critical infrastructure identified within the Village consists of thirteen (13) culverts and sixty-two (62) outfalls. Sensitivity analysis was conducted on these assets, considering their defined Level of Service (LOS) and the outcomes of the exposure analysis. Details of the sensitivity analysis results for the critical infrastructure assets are presented in the subsequent section.

8.3.6 Culverts

Thirteen (13) culverts were identified within Village limits to be evaluated for sensitivity analysis. A map identifying the location of each culvert is provided in **Appendix E**.

8.3.6.1 Sea-Level Rise Scenarios

To determine the impact of sea-level rise on the culverts, the analysis focused on comparing the maximum depth of flood for the 50-YR, 72-HR design storm event against the elevation of the top of the culvert. The sensitivity levels were determined using the classification presented in **Table 8-1**. The results of this analysis are provided in **Table 8-11**.

Table 8-11. Sensitivity Analysis for Culverts in Sea-Level Rise Scenarios

Asset Type	Asset ID	Sensitivity Assessment, (Flood Depth – Elevation) (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
Culvert	5010D000U003	-1.03	-0.84	-0.77	0.40
	5010D000U004	-2.62	-2.43	-2.36	-1.19
	5011D004U001	2.33	2.48	2.53	3.19
	5011D013U001	2.14	2.29	2.34	3.00
	5011D016U001	2.19	2.24	2.26	2.56
	5011D019U001	2.09	2.24	2.29	2.95
	5011D023U001	-1.25	-1.07	-1.00	0.09
	5011D029U001	2.07	2.25	2.31	3.42
	5014D000U001	-1.28	-1.22	-1.20	-0.75
	5014D035U001	2.32	2.53	2.60	3.69
	5014D035U002	2.77	3.04	3.12	4.38
	5014D043U001	1.51	1.57	1.59	2.04
	5014D054U001	0.21	0.61	0.74	2.43
		Legend	High	Medium	Low

* Note: “IL” and “IH” indicate intermediate-low and intermediate-high, respectively.

The sensitivity analysis results for culverts under sea level rise scenarios reveal that, across all modeling scenarios, four culverts exhibit low sensitivity to flooding, while nine culverts consistently demonstrate high sensitivity to flooding.

8.3.6.2 Storm Surge Modeling

To quantify the impact of sea-level rise on the culverts, the analysis focused on comparing the maximum depth of flood for the 50-YR, 72-HR design storm event under Category 1 and Category 5 storm surge against the elevation of the top of the culvert. The sensitivity levels were determined using the classification presented in **Table 8-1**. The results of these scenarios are provided in **Table 8-12** and **Table 8-13.**

Table 8-12.Sensitivity Analysis of Culverts under Category 1 Storm Surge Conditions

Asset Type	Asset ID	Sensitivity Assessment, (Flood Depth – Elevation) (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
Culvert	5010D000U003	0.98	0.98	1.54	2.82
	5010D000U004	-0.61	-0.61	-0.05	1.23
	5011D004U001	3.62	3.62	4.00	5.88
	5011D013U001	3.43	3.43	3.81	5.69
	5011D016U001	2.84	2.84	3.05	4.78
	5011D019U001	3.38	3.38	3.76	5.64
	5011D023U001	0.65	0.65	1.14	2.87
	5011D029U001	3.95	3.95	4.41	5.42
	5014D000U001	-0.36	-0.36	0.03	2.09
	5014D035U001	4.22	4.22	4.62	6.12
	5014D035U002	4.96	4.96	5.40	6.96
	5014D043U001	2.43	2.43	2.82	4.88
	5014D054U001	3.13	3.13	3.67	5.41
		Legend	High	Medium	Low

* Note: “IL” and “IH” indicate intermediate-low and intermediate-high, respectively.

Table 8-13. Sensitivity Analysis of Culverts under Category 5 Storm Surge Conditions

Asset Type	Asset ID	Sensitivity Assessment, (Flood Depth – Elevation) (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
Culvert	5010D000U003	3.44	3.83	3.77	5.65
	5010D000U004	1.85	2.24	2.18	4.06
	5011D004U001	6.56	6.97	6.83	8.84
	5011D013U001	6.37	6.78	6.64	8.65
	5011D016U001	5.47	5.88	5.72	7.71
	5011D019U001	6.32	6.73	6.59	8.60
	5011D023U001	3.58	4.00	4.12	5.87
	5011D029U001	5.99	6.36	6.22	8.14
	5014D000U001	2.84	3.27	3.15	5.14
	5014D035U001	6.81	7.23	7.25	9.12
	5014D035U002	7.65	8.07	8.12	9.95
	5014D043U001	5.63	6.06	5.94	7.93
	5014D054U001	6.12	6.54	6.67	8.41
		Legend	High	Medium	Low

* Note: “IL” and “IH” indicate intermediate-low and intermediate-high, respectively.

In the Category 1 storm surge scenario, two culverts show a low to medium sensitivity to flooding in the initial scenarios, while eleven culverts consistently demonstrate a high susceptibility to flooding across all scenarios. In Category 5 storm surge conditions, all culverts exhibit a high sensitivity to flooding.

8.3.7 Outfalls

A total of sixty-two (62) outfalls were identified as part of the critical asset inventory within the Village. The sensitivity analysis is presented in the following subsections. The location map for the outfalls is provided in **Appendix E**.

8.3.7.1 Sea-Level Rise Scenarios

To determine the impact of sea-level rise on the outfalls, we determined the maximum flood depth along the roadways near the catch basins upstream of each outfall during the 10-YR, 72-HR design storm event. Using the criteria provided in **Table 8-1,** a sensitivity analysis was performed and the results are summarized in **Table 8-14**.

Table 8-14. Sensitivity Analysis of Outfalls in Sea-Level Rise Scenarios

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
16 07	7000 SW 124 St	-3.64	-3.40	-3.32	-2.27
2100	12351 SW 124th St	-4.40	-4.16	-4.09	-3.07
2101	SW 125 St Between 7045 and 7000	-1.46	-1.22	-1.14	-0.09
2102	12700 SW 67 Ct	2.83	2.84	2.85	2.90
2103	7101 SW 136 St	-0.85	-0.46	-0.34	1.30
2103A	SW 70 Ct Between 12020 and 12025	-1.64	-1.40	-1.32	-0.31
2104	13590 SW 70 Ave	-0.42	-0.03	0.09	1.73
2105	12475 SW 124 St	4.46	4.70	4.78	5.83
2106	12475 SW 124 St	4.46	4.70	4.78	5.83
2108	SW 118 St Between 7240 and 7241	-1.91	-1.68	-1.61	-0.68
2109	SW 72nd Place Between 11681 and 11701	-0.97	-0.74	-0.67	0.26
2110	SW 72nd Place Between 11551 and 11601	-1.13	-0.90	-0.83	0.10
2111	SW 116 St Between 11550 and 7260	1.46	1.69	1.76	2.69
2112	SW 72 Ave Between 11730 and 11760	1.43	1.66	1.73	2.66
2113	11401 SW 114 St	-0.35	-0.12	-0.05	0.88
2114	11200 SW 112 St	-4.13	-3.90	-3.83	-2.90
2115	10775 SW 78 Ave	0.55	0.76	0.83	1.69
2116	SW 107 St Between 7600 and 7550	0.24	0.45	0.52	1.39
2117	SW 75 Ct Between 10855 and 10905	0.49	0.70	0.77	1.64
2118	SW 109 Ter. Between 7460 and 7440	0.99	1.20	1.27	2.14
2119	SW 109 Ter. Between 7220 and 7200	0.61	0.82	0.89	1.76
2120	11001 SW 74 Ave	-0.72	-0.51	-0.44	0.43
2121	SW 110 Ter. Between 7105 and 7075	1.18	1.30	1.34	1.83
2122	6950 SW 109 Ter	1.86	1.98	2.02	2.51
2123	7021 SW 107 St.	0.10	0.22	0.26	0.74
2124	SW 71 Ave Between 10225 and 10305	3.83	3.84	3.84	3.90
2125	9800 SW 98 St	0.99	1.00	1.00	1.06
OF-1	(SOUTH PIPE) 6703 SW 130 Ter	2.13	2.14	2.15	2.20
OF-10	SW 77 Ct Between 10650 and 10751	-0.78	-0.57	-0.50	0.36
OF-11	SW 110 Ter. Between 7321 and 7301	-0.69	-0.48	-0.41	0.46
OF-12	7770 SW 106 Ter	-0.26	-0.05	0.02	0.88
OF-13	SW 70 Ave Between 10100 and 10130	3.88	3.89	3.89	3.95
OF-14	11190 SW 124 St	-0.07	0.09	0.14	0.74

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
OF-15	12800 SW 69 Ave	-3.41	-3.03	-2.91	-1.27
OF-16	SW 120 St Between 12020 and 12025	-1.63	-1.39	-1.31	-0.30
OF-17	SE Intersection of SW 120 St and SW 72 Ave	-1.83	-1.59	-1.51	-0.50
OF-18	SW 114 St	2.39	2.55	2.60	3.20
OF-19	11400 SW 72 Ct	0.86	1.09	1.16	2.09
OF-2	(NORTH PIPE) 6703 SW 130 Ter	4.02	4.02	4.02	4.03
OF-20	10170 SW 70 Ave	3.64	3.64	3.64	3.65
OF-21	Between 6981 SW 134 St and 13400 SW 70 Ave	-2.35	-2.11	-2.03	-1.02
OF-22	SW 70 Ave Between 13040 and 13060	2.13	2.14	2.15	2.20
OF-23	Between 6880 SW 126 Ter and 12701 SW 69 Ave	3.89	3.90	3.90	3.96
OF-24	SW 119 St Between 7240 and 7241	-2.91	-2.52	-2.40	-0.76
OF-25	Between 11205 SW 71 Ave and 11200 SW 70 Ave	1.58	1.65	1.68	2.33
OF-26	7625 SW 108 Ter	2.97	2.98	2.99	3.04
OF-27	SW 107 St Between 6955 and 6925	-1.61	-1.38	-1.31	-0.38
OF-28	SW 101 St Between 10105 and 10125	-0.72	-0.56	-0.51	0.09
OF-3	SW 68 Ave Between 12841 and 12861	-5.28	-5.07	-5.00	-4.13
OF-4	7000 SW 133 St	0.05	0.17	0.21	0.69
OF-5	6950 SW 69th Ct	3.90	3.91	3.91	3.97
OF-6	SW 72nd Ave Between 13421 and 13471	2.91	2.92	2.93	2.98
OF-7	SW 69 Ct Between 12905 and 12925	-4.33	-3.95	-3.83	-2.21
OF-8	SW 117 Ter between 7241 and 7240	-2.91	-2.53	-2.41	-0.77
OF-9	SW 72nd Ave Between 11660 and 11700	-2.86	-2.47	-2.35	-0.71
OF-A1	Near SW 135th St	-2.94	-2.56	-2.44	-0.80
OF-A2	Near SW 59th Ave	-0.75	-0.52	-0.45	0.48
OF-A3	Near intersection of SW 120th ST & SW 72nd Ave	-0.75	-0.52	-0.45	0.48
PIPE1	12025 SW 71 Ct	-2.20	-1.96	-1.88	-0.87
PIPE2	7021 SW 107 St	0.10	0.22	0.26	0.74
PIPE3	7150 SW 98 St	1.10	1.11	1.11	1.15
PIPE4	SW 99 St Between 7141 and 7140	3.29	3.30	3.30	3.36
		Legend	High	Medium	Low

* Note: “IL” and “IH” indicate intermediate-low and intermediate-high, respectively.

Results of the sensitivity analysis show that, under sea-level rise scenarios, a total of twenty-seven (27) outfalls have low sensitivity to flooding, three (3) have medium sensitivity, and thirty-two (32) have high sensitivity to flooding. The highest sensitivity was found near 6703 SW 130 Ter.

8.3.7.2 Storm Surge Modeling

To determine the impact of storm surge on the outfalls, we determined the maximum flood depth along the roadways near the catch basins upstream of each outfall during the 10-YR, 72-HR design storm event for the Category 1 and Category 5 scenarios. Using the criteria provided in **Table 8-1,** a sensitivity analysis was performed and the results are summarized in **Table 8-15** and **Table 8-16**.

Table 8-15. Sensitivity Analysis of Culverts under Category 1 Storm Surge Conditions

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
16 07	7000 SW 124 St	-1.88	-1.63	-1.50	-1.48
2100	12351 SW 124th St	-2.69	-2.45	-2.32	-2.31
2101	SW 125 St Between 7045 and 7000	0.30	0.55	0.68	0.70
2102	12700 SW 67 Ct	2.92	2.93	2.96	2.97
2103	7101 SW 136 St	1.96	2.36	2.49	2.49
2103A	SW 70 Ct Between 12020 and 12025	0.07	0.31	0.44	0.45
2104	13590 SW 70 Ave	2.39	2.79	2.92	2.92
2105	12475 SW 124 St	-1.93	-1.68	-1.55	-1.53
2106	12475 SW 124 St	-1.93	-1.68	-1.55	-1.53
2108	SW 118 St Between 7240 and 7241	-0.34	-0.13	0.00	0.01
2109	SW 72nd Place Between 11681 and 11701	0.60	0.81	0.94	0.95
2110	SW 72nd Place Between 11551 and 11601	0.44	0.65	0.78	0.79
2111	SW 116 St Between 11550 and 7260	3.03	3.24	3.37	3.38
2112	SW 72 Ave Between 11730 and 11760	3.00	3.21	3.34	3.35
2113	11401 SW 114 St	1.22	1.43	1.56	1.57
2114	11200 SW 112 St	-2.56	-2.35	-2.22	-2.21
2115	10775 SW 78 Ave	1.99	2.18	2.30	2.31
2116	SW 107 St Between 7600 and 7550	1.70	1.89	2.01	2.02
2117	SW 75 Ct Between 10855 and 10905	1.95	2.14	2.26	2.27
2118	SW 109 Ter. Between 7460 and 7440	2.45	2.64	2.76	2.77
2119	SW 109 Ter. Between 7220 and 7200	2.07	2.26	2.38	2.40
2120	11001 SW 74 Ave	0.74	0.93	1.05	1.06

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
2121	SW 110 Ter. Between 7105 and 7075	2.00	2.12	2.20	2.21
2122	6950 SW 109 Ter	2.68	2.80	2.88	2.89
2123	7021 SW 107 St.	0.91	1.03	1.11	1.13
2124	SW 71 Ave Between 10225 and 10305	3.92	3.94	3.97	3.98
2125	9800 SW 98 St	1.08	1.10	1.13	1.14
OF-1	(SOUTH PIPE) 6703 SW 130 Ter	2.22	2.23	2.26	2.27
OF-10	SW 77 Ct Between 10650 and 10751	0.66	0.85	0.97	0.98
OF-11	SW 110 Ter. Between 7321 and 7301	0.77	0.96	1.08	1.10
OF-12	7770 SW 106 Ter	1.18	1.37	1.49	1.50
OF-13	SW 70 Ave Between 10100 and 10130	3.97	3.99	4.02	4.03
OF-14	11190 SW 124 St	0.95	1.10	1.21	1.22
OF-15	12800 SW 69 Ave	-0.61	-0.21	-0.08	-0.08
OF-16	SW 120 St Between 12020 and 12025	0.08	0.32	0.45	0.46
OF-17	SE Intersection of SW 120 St and SW 72 Ave	-0.12	0.11	0.24	0.26
OF-18	SW 114 St	3.41	3.56	3.67	3.68
OF-19	11400 SW 72 Ct	2.43	2.64	2.77	2.78
OF-2	(NORTH PIPE) 6703 SW 130 Ter	4.02	4.03	4.06	4.07
OF-20	10170 SW 70 Ave	3.64	3.65	3.68	3.69
OF-21	Between 6981 SW 134 St and 13400 SW 70 Ave	-0.64	-0.41	-0.28	-0.26
OF-22	SW 70 Ave Between 13040 and 13060	2.22	2.23	2.26	2.27
OF-23	Between 6880 SW 126 Ter and 12701 SW 69 Ave	3.98	4.00	4.03	4.04
OF-24	SW 119 St Between 7240 and 7241	-0.10	0.30	0.43	0.43
OF-25	Between 11205 SW 71 Ave and 11200 SW 70 Ave	2.60	2.76	2.87	2.87
OF-26	7625 SW 108 Ter	3.06	3.07	3.10	3.11
OF-27	SW 107 St Between 6955 and 6925	-0.04	0.17	0.30	0.31
OF-28	SW 101 St Between 10105 and 10125	0.30	0.45	0.56	0.57
OF-3	SW 68 Ave Between 12841 and 12861	-3.82	-3.63	-3.51	-3.5
OF-4	7000 SW 133 St	0.86	0.98	1.06	1.08
OF-5	6950 SW 69th Ct	3.99	4.01	4.04	4.05
OF-6	SW 72nd Ave Between 13421 and 13471	3.00	3.01	3.04	3.05
OF-7	SW 69 Ct Between 12905 and 12925	-1.55	-1.16	-1.03	-1.03
OF-8	SW 117 Ter between 7241 and 7240	-0.11	0.29	0.42	0.42
OF-9	SW 72nd Ave Between 11660 and 11700	-0.05	0.35	0.48	0.48
OF-A1	Near SW 135th St	-0.14	0.26	0.39	0.39
OF-A2	Near SW 59th Ave	0.82	1.03	1.16	1.17

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
OF-A3	Near intersection of SW 120th ST & SW 72nd Ave	0.82	1.03	1.16	1.17
PIPE1	12025 SW 71 Ct	-0.49	-0.26	-0.13	-0.11
PIPE2	7021 SW 107 St	0.91	1.03	1.11	1.13
PIPE3	7150 SW 98 St	1.17	1.18	1.21	1.22
PIPE4	SW 99 St Between 7141 and 7140	3.38	3.40	3.43	3.44
		Legend	High	Medium	Low

* Note: "IL" and "IH" indicate intermediate-low and intermediate-high, respectively.

Table 8-16. Sensitivity Analysis of Culverts under Category 5 Storm Surge Conditions

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
16 07	7000 SW 124 St	0.27	0.70	0.83	2.48
2100	12351 SW 124th St	-0.59	-0.16	-0.03	1.60
2101	SW 125 St Between 7045 and 7000	2.45	2.88	3.01	4.66
2102	12700 SW 67 Ct	3.56	3.92	4.04	5.66
2103	7101 SW 136 St	4.86	5.27	5.40	7.14
2103A	SW 70 Ct Between 12020 and 12025	2.18	2.60	2.73	4.36
2104	13590 SW 70 Ave	5.29	5.70	5.83	7.57
2105	12475 SW 124 St	0.22	0.65	0.78	2.43
2106	12475 SW 124 St	0.22	0.65	0.78	2.43
2108	SW 118 St Between 7240 and 7241	1.53	1.97	2.10	3.65
2109	SW 72nd Place Between 11681 and 11701	2.47	2.91	3.04	4.59
2110	SW 72nd Place Between 11551 and 11601	2.31	2.75	2.88	4.43
2111	SW 116 St Between 11550 and 7260	4.90	5.34	5.47	7.02
2112	SW 72 Ave Between 11730 and 11760	4.87	5.31	5.44	6.99
2113	11401 SW 114 St	3.09	3.53	3.66	5.21
2114	11200 SW 112 St	-0.69	-0.25	-0.12	1.43
2115	10775 SW 78 Ave	3.68	4.12	4.26	6.14
2116	SW 107 St Between 7600 and 7550	3.41	3.86	4.00	5.89
2117	SW 75 Ct Between 10855 and 10905	3.66	4.11	4.25	6.14
2118	SW 109 Ter. Between 7460 and 7440	4.16	4.61	4.75	6.64
2119	SW 109 Ter. Between 7220 and 7200	3.79	4.23	4.37	6.26

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
2120	11001 SW 74 Ave	2.45	2.9	3.04	4.93
2121	SW 110 Ter. Between 7105 and 7075	3.49	3.92	4.02	5.84
2122	6950 SW 109 Ter	4.17	4.60	4.70	6.52
2123	7021 SW 107 St.	2.40	2.84	2.94	4.75
2124	SW 71 Ave Between 10225 and 10305	4.63	4.98	5.04	6.72
2125	9800 SW 98 St	1.79	2.14	2.20	3.88
OF-1	(SOUTH PIPE) 6703 SW 130 Ter	2.86	3.22	3.34	4.96
OF-10	SW 77 Ct Between 10650 and 10751	2.35	2.79	2.93	4.81
OF-11	SW 110 Ter. Between 7321 and 7301	2.49	2.93	3.07	4.96
OF-12	7770 SW 106 Ter	2.87	3.31	3.45	5.33
OF-13	SW 70 Ave Between 10100 and 10130	4.68	5.03	5.09	6.77
OF-14	11190 SW 124 St	2.73	3.19	3.30	5.12
OF-15	12800 SW 69 Ave	2.28	2.70	2.83	4.56
OF-16	SW 120 St Between 12020 and 12025	2.19	2.61	2.74	4.37
OF-17	SE Intersection of SW 120 St and SW 72 Ave	1.98	2.40	2.53	4.16
OF-18	SW 114 St	5.19	5.65	5.76	7.58
OF-19	11400 SW 72 Ct	4.30	4.74	4.87	6.42
OF-2	(NORTH PIPE) 6703 SW 130 Ter	4.11	4.22	4.29	5.79
OF-20	10170 SW 70 Ave	3.73	3.84	3.91	5.41
OF-21	Between 6981 SW 134 St and 13400 SW 70 Ave	1.46	1.88	2.01	3.64
OF-22	SW 70 Ave Between 13040 and 13060	2.86	3.22	3.34	4.96
OF-23	Between 6880 SW 126 Ter and 12701 SW 69 Ave	4.69	5.04	5.10	6.78
OF-24	SW 119 St Between 7240 and 7241	2.80	3.21	3.34	5.08
OF-25	Between 11205 SW 71 Ave and 11200 SW 70 Ave	3.77	4.00	4.10	5.60
OF-26	7625 SW 108 Ter	3.70	4.06	4.18	5.80
OF-27	SW 107 St Between 6955 and 6925	1.83	2.27	2.40	3.95
OF-28	SW 101 St Between 10105 and 10125	2.08	2.54	2.65	4.47
OF-3	SW 68 Ave Between 12841 and 12861	-2.11	-1.66	-1.52	0.37
OF-4	7000 SW 133 St	2.35	2.79	2.89	4.70
OF-5	6950 SW 69th Ct	4.70	5.05	5.11	6.79
OF-6	SW 72nd Ave Between 13421 and 13471	3.64	4.00	4.12	5.74
OF-7	SW 69 Ct Between 12905 and 12925	1.32	1.74	1.87	3.60
OF-8	SW 117 Ter between 7241 and 7240	2.78	3.20	3.33	5.06
OF-9	SW 72nd Ave Between 11660 and 11700	2.85	3.26	3.39	5.13
OF-A1	Near SW 135th St	2.75	3.17	3.30	5.03

Asset ID	Location	Sensitivity Assessment, Flood Depth (ft.)			
		2040 IL*	2040 IH*	2070 IL*	2070 IH*
OF-A2	Near SW 59th Ave	2.69	3.13	3.26	4.81
OF-A3	Near intersection of SW 120th ST & SW 72nd Ave	2.69	3.13	3.26	4.81
PIPE1	12025 SW 71 Ct	1.61	2.03	2.16	3.79
PIPE2	7021 SW 107 St	2.40	2.84	2.94	4.75
PIPE3	7150 SW 98 St	1.86	2.21	2.27	3.95
PIPE4	SW 99 St Between 7141 and 7140	4.09	4.44	4.50	6.18
		Legend	High	Medium	Low

* Note: "IL" and "IH" indicate intermediate-low and intermediate-high, respectively.

The sensitivity analysis findings for culverts indicate that under Category 1 conditions, eleven (11) culverts demonstrate low sensitivity, eight (8) exhibit medium sensitivity, and forty-three (43) show high sensitivity to flooding across all scenarios. Conversely, under Category 5 storm surge conditions, one (1) culvert displays low sensitivity, two (2) show medium sensitivity and fifty-nine (59) demonstrate high sensitivity to flooding across all modeling scenarios.

8.3.8 Natural, Cultural, and Historical Resources

A total of nine (9) parks were identified within the Village as Natural, Cultural, and Historical Resources. These parks are Coral Pine Park, Evelyn Greer Park, Flagler Grove Park, Hidden Pine Park, Linear Park, Pinecrest Gardens, Red Road Linear Parks, Suniland Park, and Veterans Wayside Park.

8.3.9 Parks

The sensitivity analysis was performed for the parks under the sea-level rise scenarios and storm surge conditions. The results are provided in the following subsections.

8.3.9.1 Sea-Level Rise Scenarios

To determine the sensitivity level of parks under sea level rise scenarios, the maximum depth of flood for the 100-YR, 72-HR design storm event was used to obtain the flooding area of the park where the depth exceeds 0.5 feet. The results of this analysis along with the total area of each park is provided in **Table 8-17**.

Table 8-17. Sensitivity Analysis of Parks under Sea-Level Rise Scenarios

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
2040 IL	Coral Pine Park	9.62	80.33	High
	Evelyn Greer Park	9.69	69.41	High
	Flagler Grove Park	3.08	0.00	Low
	Hidden Pine Park	2.18	0.00	Low
	Linear Park	0.28	0.00	Low
	Pinecrest Gardens	12.89	19.24	Low
	Red Road Linear Park	4.93	69.39	High
	Suniland Park	10.01	57.51	Medium
	Veterans Wayside Park	3.18	97.39	High
2040 IH	Coral Pine Park	9.62	81.97	High
	Evelyn Greer Park	9.69	69.41	High
	Flagler Grove Park	3.08	0.00	Low
	Hidden Pine Park	2.18	0.00	Low
	Linear Park	0.28	0.00	Low
	Pinecrest Gardens	12.89	19.44	Low
	Red Road Linear Park	4.93	70.07	High
	Suniland Park	10.01	57.51	Medium
	Veterans Wayside Park	3.18	79.86	High
2070 IL	Coral Pine Park	9.62	82.71	High
	Evelyn Greer Park	9.69	69.41	High
	Flagler Grove Park	3.08	0.00	Low
	Hidden Pine Park	2.18	0.00	Low
	Linear Park	0.28	0.00	Low
	Pinecrest Gardens	12.89	19.48	Low
	Red Road Linear Park	4.93	70.37	High
	Suniland Park	10.01	57.51	Medium
	Veterans Wayside Park	3.18	79.86	High
2070 IH	Coral Pine Park	9.62	88.74	High
	Evelyn Greer Park	9.69	75.79	High
	Flagler Grove Park	3.08	0.00	Low
	Hidden Pine Park	2.18	83.64	High
	Linear Park	0.28	6.64	Low
	Pinecrest Gardens	12.89	25.98	Low
	Red Road Linear Park	4.93	78.29	High
	Suniland Park	10.01	62.84	Medium

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
	Veterans Wayside Park	3.18	80.91	High

Legend High Medium Low

The sensitivity analysis results for parks reveal that Flagler Grove Park, Linear Park, and Pinecrest Gardens exhibit low sensitivity to flooding across all sea-level rise scenarios. Conversely, other parks demonstrate varying degrees of moderate to high sensitivity across the four scenarios.

8.3.9.2 Storm Surge Modeling

To assess the sensitivity level of the parks under storm surge conditions, the maximum depth of flood for the 100-YR, 72-HR design storm event under the Category 1 and Category 5 storm surge events was used to obtain the flooding area of the parks where the depth of flood exceeds 0.5 feet. The results of these analyses are provided in **Table 8-18** and **Table 8-19.**

Table 8-18. Sensitivity Analysis of Parks under Category 1 Storm Surge Conditions

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
2040 IL	Coral Pine Park	9.62	93.48	High
	Evelyn Greer Park	9.69	93.22	High
	Flagler Grove Park	3.08	0.04	Low
	Hidden Pine Park	2.18	96.98	High
	Linear Park	0.28	31.59	Low
	Pinecrest Gardens	12.89	40.51	Medium
	Red Road Linear Park	4.93	87.11	High
	Suniland Park	10.01	95.49	High
	Veterans Wayside Park	3.18	86.65	High
2040 IH	Coral Pine Park	9.62	95.26	High
	Evelyn Greer Park	9.69	98.73	High
	Flagler Grove Park	3.08	0.84	Low
	Hidden Pine Park	2.18	98.84	High
	Linear Park	0.28	69.82	High
	Pinecrest Gardens	12.89	56.94	Medium
	Red Road Linear Park	4.93	94.71	High
	Suniland Park	10.01	97.99	High

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
	Veterans Wayside Park	3.18	96.60	High
2070 IL	Coral Pine Park	9.62	94.84	High
	Evelyn Greer Park	9.69	99.15	High
	Flagler Grove Park	3.08	0.46	Low
	Hidden Pine Park	2.18	98.63	High
	Linear Park	0.28	69.75	High
	Pinecrest Gardens	12.89	60.19	Medium
	Red Road Linear Park	4.93	92.64	High
	Suniland Park	10.01	98.12	High
	Veterans Wayside Park	3.18	98.33	High
2070 IH	Coral Pine Park	9.62	100.00	High
	Evelyn Greer Park	9.69	99.27	High
	Flagler Grove Park	3.08	100.00	High
	Hidden Pine Park	2.18	99.95	High
	Linear Park	0.28	99.98	High
	Pinecrest Gardens	12.89	92.06	High
	Red Road Linear Park	4.93	99.98	High
	Suniland Park	10.01	100.00	High
	Veterans Wayside Park	3.18	100.00	High

Legend High Medium Low

Table 8-19. Sensitivity Analysis of Parks under Category 5 Storm Surge Conditions

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
2040 IL	Coral Pine Park	9.62	100.00	High
	Evelyn Greer Park	9.69	99.94	High
	Flagler Grove Park	3.08	100.00	High
	Hidden Pine Park	2.18	99.97	High
	Linear Park	0.28	100.00	High
	Pinecrest Gardens	12.89	94.30	High
	Red Road Linear Park	4.93	100.00	High
	Suniland Park	10.01	100.00	High
	Veterans Wayside Park	3.18	100.00	High
2040 IH	Coral Pine Park	9.62	100.00	High
	Evelyn Greer Park	9.69	99.98	High

Scenario	Park	Total Area (Acre)	% Flooded Area, Flood Depth > 0.5 (ft.)	Sensitivity Assessment
	Flagler Grove Park	3.08	100.00	High
	Hidden Pine Park	2.18	99.98	High
	Linear Park	0.28	100.00	High
	Pinecrest Gardens	12.89	95.06	High
	Red Road Linear Park	4.93	100.00	High
	Suniland Park	10.01	100.00	High
	Veterans Wayside Park	3.18	100.00	High
2070 IL	Coral Pine Park	9.62	100.00	High
	Evelyn Greer Park	9.69	99.98	High
	Flagler Grove Park	3.08	100.00	High
	Hidden Pine Park	2.18	99.98	High
	Linear Park	0.28	100.00	High
	Pinecrest Gardens	12.89	94.90	High
	Red Road Linear Park	4.93	100.00	High
	Suniland Park	10.01	100.00	High
	Veterans Wayside Park	3.18	100.00	High
2070 IH	Coral Pine Park	9.62	100.00	High
	Evelyn Greer Park	9.69	100.00	High
	Flagler Grove Park	3.08	100.00	High
	Hidden Pine Park	2.18	100.00	High
	Linear Park	0.28	100.00	High
	Pinecrest Gardens	12.89	97.20	High
	Red Road Linear Park	4.93	100.00	High
	Suniland Park	10.01	100.00	High
	Veterans Wayside Park	3.18	100.00	High

Legend High Medium Low

The sensitivity analysis conducted under Category 1 storm surge conditions indicates that Flagler Grove Park and Pinecrest Gardens demonstrate low to medium sensitivity across all scenarios except in the 2070 Intermediate-High scenario, where they exhibit high sensitivity. Conversely, all other parks display high sensitivity to flooding in all scenarios. In contrast, during the Category 5 storm surge event, all parks demonstrate high sensitivity across all modeling scenarios.

APPENDIX A

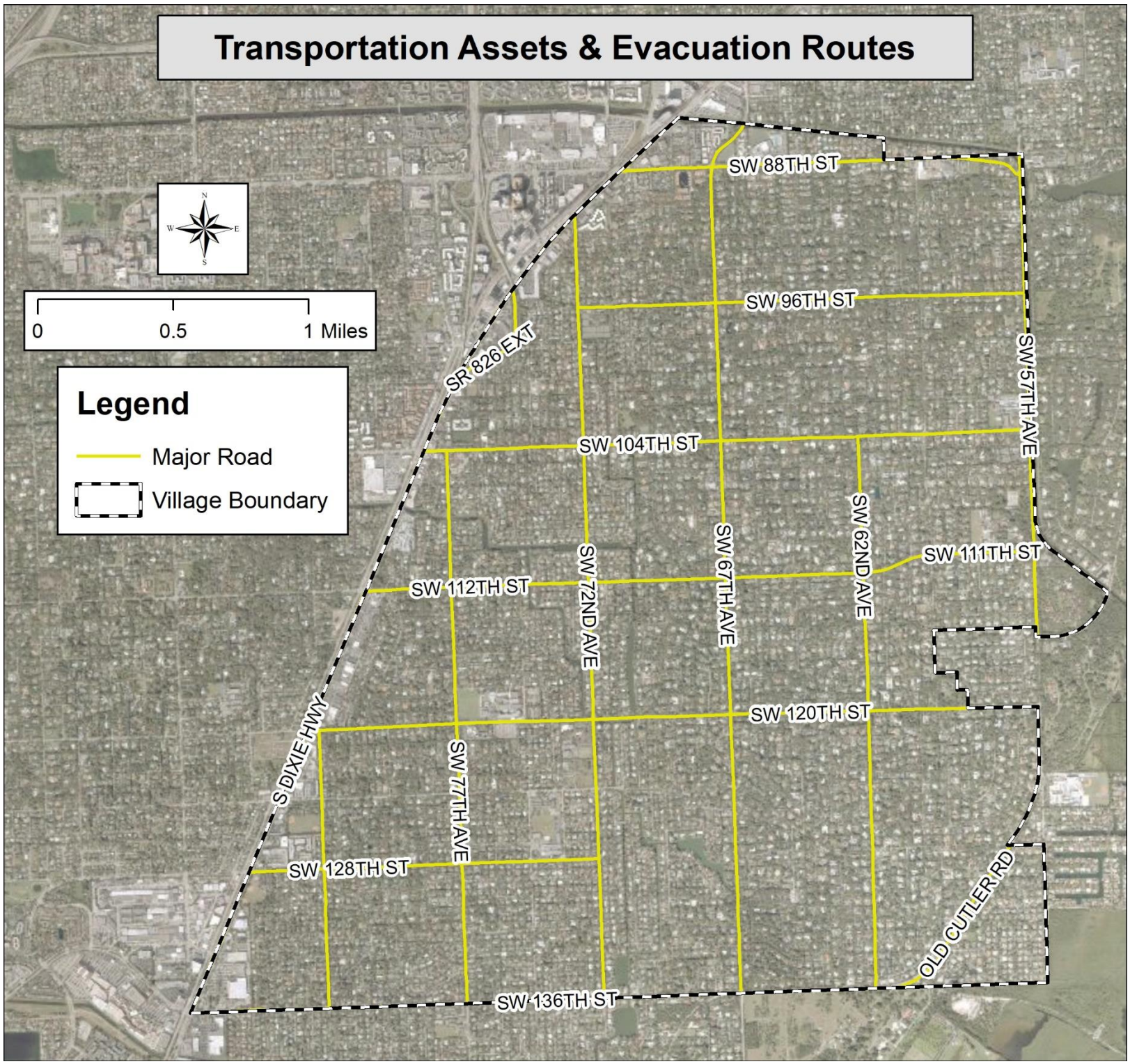
Data Catalog

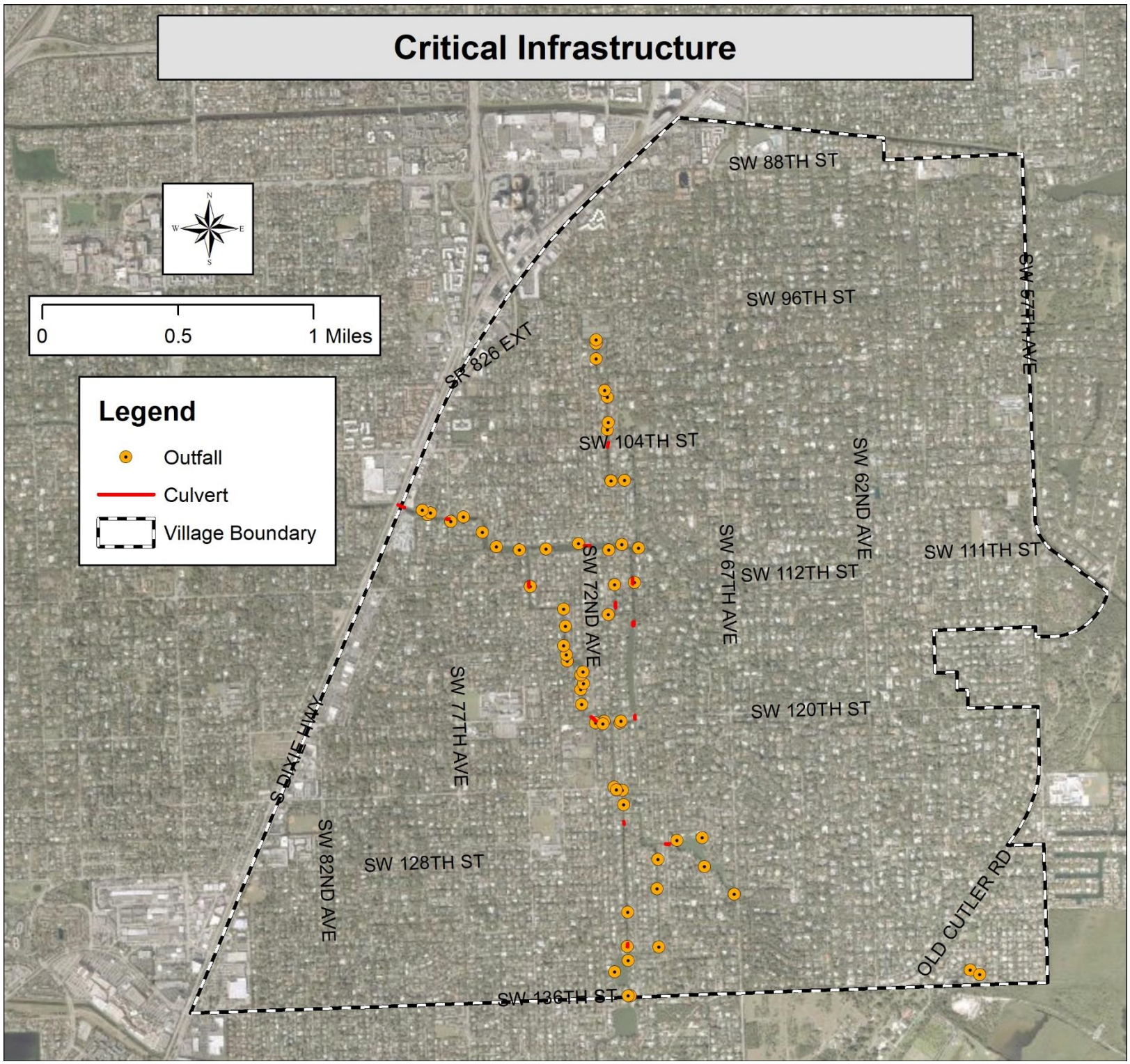
Asset Category	Asset Type	Applicable Federal Data	Applicable State Data	Applicable County Data	Applicable Village Data	Data/File Type Obtained	Data/File Description and/or Comments	Applicable URL Link (1)	Applicable URL Link (2)	Applicable URL Link (3)	Applicable URL Link (4)
Transportation Assets & Evacuation Routes	**Airports**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.		There are no existing airport within the Village of Pinecrest.				
Transportation Assets & Evacuation Routes	**Ports**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.		There are no existing port within the Village of Pinecrest.				
Transportation Assets & Evacuation Routes	**Marinas**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.		There are no existing Marinas within the Village of Pinecrest.				
Transportation Assets & Evacuation Routes	**Bridges**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	Note: The Bridges feature class shows the location of bridges as derived from event mapping Feature 258, characteristic BRIDGENO from the FDOT Roadway Characteristics Inventory data. County: A line feature class of Bridges within Miami-Dade County.	https://geodata.floridagio.gov/datasets/fdot::bridges/explore?location=25.817959%2C-80.321619%2C13.54	https://gis-mdc.opendata.arcgis.com/datasets/MDC::bridge/explore?location=25.817959%2C-80.321619%2C13.54		
Transportation Assets & Evacuation Routes	**Bus/Trolley Stops**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	County: A point feature class of Miami-Dade County Bus Stops.	https://gis-mdc.opendata.arcgis.com/search?q=bus%20stop	-		
Transportation Assets & Evacuation Routes	**Bus/Trolley Shelter**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of Miami-Dade Transit bus shelters within Miami-Dade County	https://gis-mdc.opendata.arcgis.com/datasets/bus-shelter/explore?location=25.724503%2C-80.300210%2C13.45	-		
Transportation Assets & Evacuation Routes	**Bus/Trolley Route**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	County: A line feature class of Miami-Dade County Bus Routes.	https://gis-mdc.opendata.arcgis.com/search?q=bus%20route	-		
Transportation Assets & Evacuation Routes	**Major Roadways**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	Yes, obtained data from Village.	GIS Shapefile (SHP)	A line feature class of the major streets within Miami-Dade County. Contains 4 classes of roads: limited access highways, divided highways/major roads, federal/state roads, and collector roads.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::major-roadway	-	-	-
Transportation Assets & Evacuation Routes	**Rail Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	No applicable data within Village Limits.			https://gis-mdc.opendata.arcgis.com/datasets/MDC::rail/explore	-	-	-
Transportation Assets & Evacuation Routes	**Railroad Bridges**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	There are no existing railroad bridges within the Village of Pinecrest.	-	-	-	-
Critical Infrastructure	**Wastewater Treatment Facilities & Lift Stations**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						-
Critical Infrastructure	**Stormwater Treatment Facilities & Pump Stations**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						-
Critical Infrastructure	**Drinking Water Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						-
Critical Infrastructure	**Solid & Hazardous Waste Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						-
Critical Infrastructure	**Military Installations**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Infrastructure	**Communications Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Infrastructure	**Outfalls**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obtained data/file(s) from Village.	GIS Shapefile (SHP)					
Critical Infrastructure	**Culverts**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obtained data/file(s) from Village.	GIS Shapefile (SHP)					
Critical Infrastructure	**Power Plants**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						
Critical Infrastructure	**Disaster Debris Management Sites**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						
Critical Community & Emergency Facilities	**K-12 Schools**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of the Miami-Dade County Public Schools facilities.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::public-school?explore&location=25.644811%2C-80.316037%2C11.17	-	-	-
Critical Community & Emergency Facilities	**Colleges/Universities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of colleges and universities within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::college?explore	-	-	-
Critical Community & Emergency Facilities	**Community Centers**	No applicable data within Village Limits.	Downloaded data/file(s) from Florida Geospatial Open Data Portal.	Downloaded data/file(s) from MDC GIS Open Data Hub.	Yes, obtained data from Village.	GIS Shapefile (SHP)	Village: A point feature class of Community Center was obtained from the Village.County: A point feature class of Community Mental Health Centers within Miami-Dade County. A point feature class containing Day Care Centers within Miami-Dade County, provided by Department of	https://gis-mdc.opendata.arcgis.com/datasets/MDC::mental-health-center/explore?location=25.750685%2C-80.318005%2C12.402	https://gis-mdc.opendata.arcgis.com/datasets/MDC::daycare/explore?location=25.750685%2C-80.318005%2C12.402	https://gis-mdc.opendata.arcgis.com/datasets/MDC::county-library/explore?location=25.850145%2C-80.332262%2C12.35	https://geodata.floridagio.gov/datasets/FDACS::public-library/explore?location=25.806749%2C
Critical Community & Emergency Facilities	**Correctional Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**Disaster Recovery Centers**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**Emergency Medical Service Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	County: A point feature class of the Ambulatory Surgical Centers throughout Miami-Dade County, used by the county's Office Of Emergency Management (OEM). A point feature class of Department of Health (DOH) Women, Infant and Children Centers (WIC's) within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::emts/explore?location=25.818176%2C-	https://gis-mdc.opendata.arcgis.com/datasets/MDC::doh-wic-center/explore?location=25.818176%2C-80.316762%2C14.35	-	-
Critical Community & Emergency Facilities	**Emergency Operation Centers**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**Fire stations**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	Yes, obtained data from Village.	GIS Shapefile (SHP)	A point feature class of Miami-Dade County Operated Fire and Rescue Stations that provide emergency or administrative services to the public.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::fire-station/explore?location=25.705723%2C-80.301165%2C11.05	-	-	-
Critical Community & Emergency Facilities	**Health care facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	County: A point feature class of Community Mental Health Centers within Miami-Dade County.Clinic: A point feature class of Department of Health (DOH) health centers within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::mental-health-center/explore?location=25.806103%2C-80.332393%2C13.01	https://gis-mdc.opendata.arcgis.com/datasets/MDC::doh-health-center/explore?location=25.797985%2C-		
Critical Community & Emergency Facilities	**Hospitals**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of the Hospital facilities within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/Hospital/explore?location=25.695234%2C-80.301418%2C13.22	-	-	-
Critical Community & Emergency Facilities	**Law Enforcement Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	Yes, obtained data from Village.	GIS Shapefile (SHP)	County: Point feature class of Miami Dade County Operated Police Stations. A point feature class of Miami-Dade County Municipal Police Stations	https://gis-mdc.opendata.arcgis.com/datasets/MDC::police-station/explore?location=25.768661%2C-80.341492%2C14.83	https://gis-mdc.opendata.arcgis.com/datasets/MDC::municipal-police-station/explore?location=25.837283%2C-		
Critical Community & Emergency Facilities	**Municipal Centers**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obtained data from Village.	GIS Shapefile (SHP)	A point feature of the Village of Pinecrest Center Hall and community Center were obtained from the Village.				
Critical Community & Emergency Facilities	**Public Work**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obtained data from Village.	GIS Shapefile (SHP)	A point feature of the Library was obtained from the Village.				
Critical Community & Emergency Facilities	**Local Government Facilities**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	County: A point feature class of Post Office locations within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::post-office?explore&location=25.813824%2C-80.348925%2C13.56	-	-	-
Critical Community & Emergency Facilities	**Logistical Staging Areas**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**Affordable Public Housing**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**Risk Shelter Inventory**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Critical Community & Emergency Facilities	**State Government Facilities**	No applicable data within Village Limits.	Downloaded data/file(s) from Florida Geospatial Open Data Portal.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	Provide point locations of SFWMD facilities for internal informational and mapping purposes.	https://geodata.floridagio.gov/datasets/sfwmd::sfwmd-facility-sites/explore?location=25.830416%2C-80.390434%2C13.35	-	-	-
Critical Community & Emergency Facilities	**Police Station**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obtained data from Village.	GIS Shapefile (SHP)	A point feature class of Village police station				
Critical Community & Emergency Facilities	**Government Center**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of goernment center				
Critical Community & Emergency Facilities	**Hurricane Shelter**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.						
Critical Community & Emergency Facilities	**Health Facility**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of Village health facility				
Natural, Cultural & Historical Resources	**Conservation Lands**	No applicable data within Village Limits.	Downloaded data/file(s) from Florida Geospatial Open Data Portal.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	This data set is used for reference and GIS analysis, Mapping, and reporting of conservation easements issued by the SFWMD.	https://geodata.floridagio.gov/datasets/sfwmd::wmp-applications-conservation-easements/explore?location=25.840090%2C-	-	-	-
Natural, Cultural & Historical Resources	**Parks**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	Yes, obatiend data from the Village.	GIS Shapefile (SHP)	A point feature class of Park and Recreational locations m anaged by Municipalities within Miami-Dade County. A point feature class of the Miami-Dade County (Unincorporated) operated park and recreation locations.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::municipal-park/explore?location=25.707617%2C-80.306582%2C11.39	https://gis-mdc.opendata.arcgis.com/datasets/MDC::county-operated-park/explore?location=25.730581%2C-	-	-
Natural, Cultural & Historical Resources	**Park Facility**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A point feature class of all park facilities (County, Municipal, State or National) within Miami-Dade County.	https://gis-mdc.opendata.arcgis.com/datasets/MDC::park-facility/explore?location=25.693972%2C-80.309009%2C11.78	-	-	-
Natural, Cultural & Historical Resources	**Shorelines**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-
Natural, Cultural & Historical Resources	**Surface Waters**	No applicable data within Village Limits.	No applicable data within Village Limits.	Downloaded data/file(s) from MDC GIS Open Data Hub.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A generalized polygon feature class of Miami-Dade County water bodies with the land features removed.	-	-	-	-
Natural, Cultural & Historical Resources	**Wetlands**	No applicable data within Village Limits.	Downloaded data/file(s) from Florida Geospatial Open Data Portal.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	Federal: The wetlands displayed on the Wetlands Mapper show wetland type and extent using a biological definition of wetlandsNote: Formal Wetland Determination: This data set is used for reference and GIS analysis, mapping, and reporting.	https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper	https://geodata.floridagio.gov/datasets/sfwmd::wcp-south-access-farmal-wetland-	-	-
Natural, Cultural & Historical Resources	**Historical & Cultural Assets**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	-	-	-	-	-	-	-
Natural, Cultural & Historical Resources	**Park Boundary**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	Yes, obatiend data from the Village.	GIS Shapefile (SHP)	A polygone feature class of Village parks				
Natural, Cultural & Historical Resources	**Water**	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	No applicable data within Village Limits.	GIS Shapefile (SHP)	A polygone feature class of Village surface water				

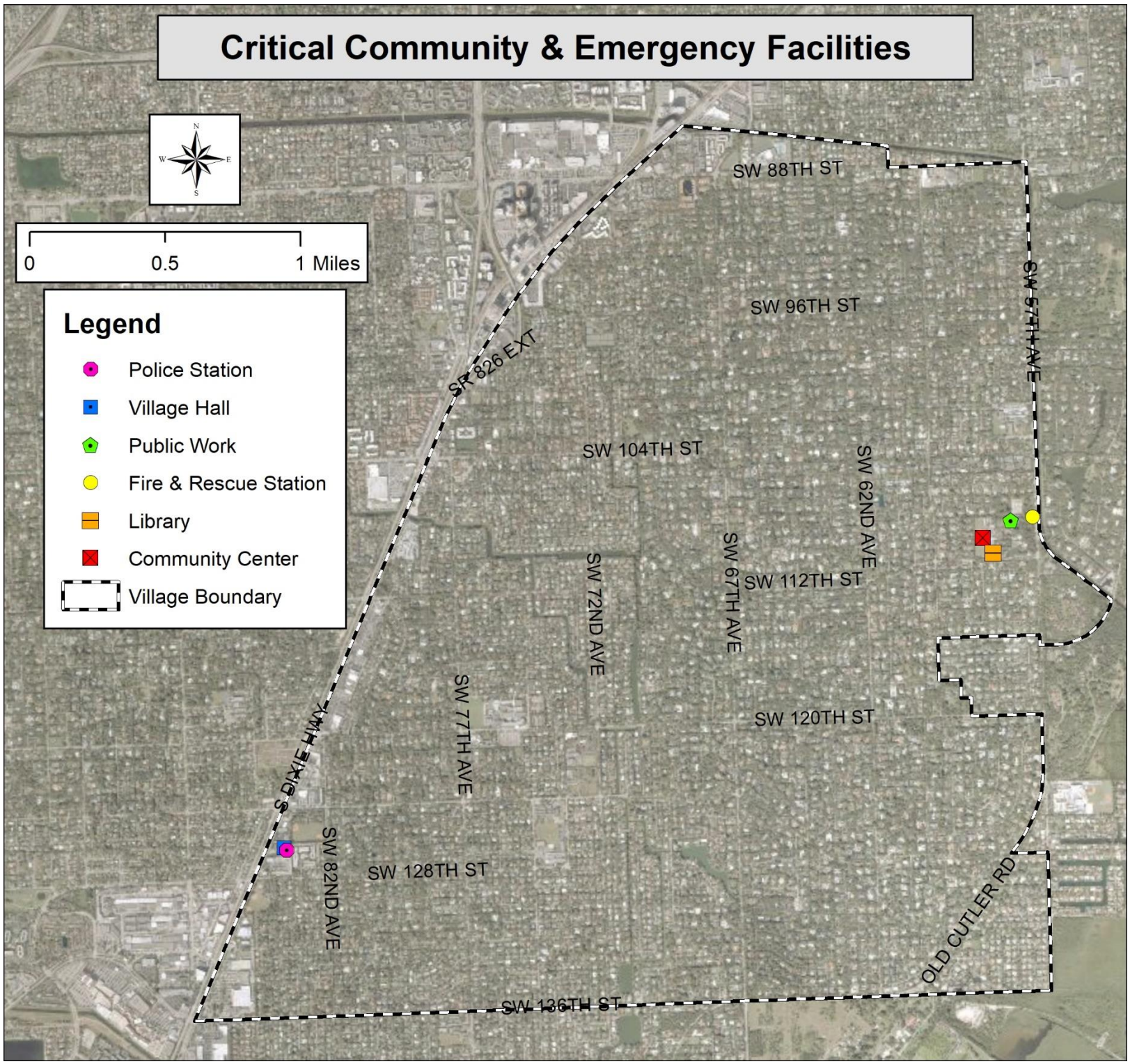
Title	Data Type	File Type	Source	Author	Data/File Description and/or Comments	Applicable URL Link (1)	Applicable URL Link (2)	Applicable URL Link (3)	Applicable URL Link (4)
Village of Pinecrest Stage Boundary Node	GIS Shapefile (SHP) & Excel	GIS Shapefile (SHP) & Excel	County	County	Peak Stage Elevation in the Existing (2020) conditions for different storm events				
Hydrologic Conditions in Urban Miami-Dade County, Florida, and the Effect of Groundwater Pumpage and Increased Sea Level on Canal Leakage and Regional Groundwater Flow	Report	PDF	USGS	USGS	Evaluates the effect of increased groundwater pumpage and/or increased sea level on canal leakage, regional groundwater flow, and the position of the freshwater-seawater interface.	https://pubs.usgs.gov/sir/2014/5162/pdf/sir2014-5162.pdf	-	-	-
Unified Sea Level Rise Projection Southeast Florida	Report	PDF	Southeast Florida Regional Climate Change Compact	Southeast Florida Regional Climate Change Compact	Provides an update to the amount of anticiptaed sea level rise in Southeast Florida through 2120.	https://southeastfloridaclimatecompact.org/wp-content/uploads/2020/04/Sea-Level-Rise-Projection-Update.pdf	-	-	-
Updating the Statewide Extreme Rainfall Projections	Report	PDF	FIU	FIU	Assesses potential updates to Miami-Dade County Flood and Rain Loads that may alter the flood risks, particulary in the current environment of changing conditions due to climate change.	https://environment.fiu.edu/what-we-study/projects/floc_fiu_finalreport.pdf	-	-	-
Global and Regional Sea Level Rise Scenarios for the United States - 2017	Report	PDF	NOAA	NOAA	Provides information and linkages between scenario-based and probabilistic projections of future sea levels for coastal-risk planning, management of long-lived critical infrastructure, mission readiness, and other purposes.	https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf	-	-	-
NOAA Atlas 14	Report/Website	PDF/Webpage	NOAA	NOAA	Provides precipitation frequency estimates for the United States and U.S. affiliated territories with associated 90% confidence intervals and supplementary information on temporal distribution of heavy precipitation, analysis of seasonality and trends in annual maximum series data, etc.	https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume9.pdf	https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=fl	-	-

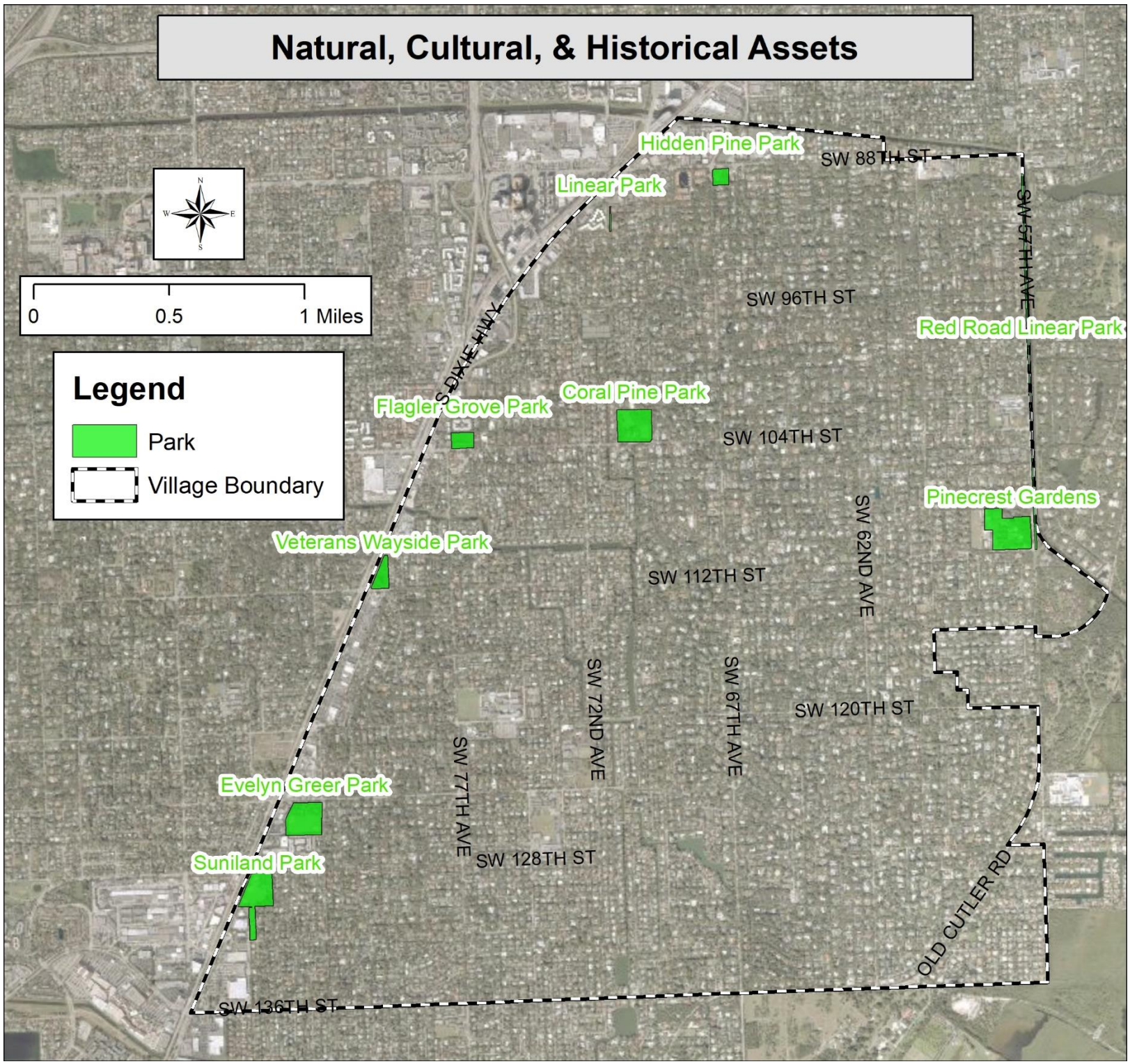
Title	Data Type	File Type	Source	Author	Data/File Description and/or Comments	Applicable URL Link (1)	Applicable URL Link (2)	Applicable URL Link (3)	Applicable URL Link (4)
Digital Elevation Model (DEM) - 2021	DEM Raster	Arc DEM	MDC Open Data Hub	GPI	The 2021 5-ft DEM is a hydro-enforced DEM developed by GPI from the 2021 LiDAR data.	https://gis-mdc.opendata.arcgis.com/documents/MDC::2021-miami-dade-county-dem-5ft/about	-	-	-
Digital Elevation Model (DEM) - 2018	DEM Raster	Arc DEM	MDC Open Data Hub	GPI	This is a Digital Elevation Model (DEM) as a raster mosaic in ESRI float format 32bit representation on a 5ft grid created from the LiDAR collected for the 2018 ITD LiDAR project.	https://gis-mdc.opendata.arcgis.com/documents/2018-miami-dade-county-dem-5ft/explore	-	-	-

Title	Data Type	File Type	Source	Author	Data/File Description and/or Comments	Applicable URL Link (1)	Applicable URL Link (2)	Applicable URL Link (3)	Applicable URL Link (4)
Village of Pinecrest Stormwater Master Plan 2015 Final Report	Report	PDF	Village	ADA Engineering	-	-	-	-	-
Village of Pinecrest Comprehensive Development Master Plan, Updates, Goals, Objectives, and Policies 2016	Report	PDF	Village	Village	-	-	-	-	-


Transportation Assets & Evacuation Routes
N
W
E
S
0
0.5
1 Miles
Legend
Major Road
Village Boundary
SW 88TH ST
SW 96TH ST
SW 104TH ST
SW 111TH ST
SW 112TH ST
SW 120TH ST
SW 128TH ST
SW 136TH ST
SR 826 EXT
SW 57TH AVE
SW 62ND AVE
SW 67TH AVE
SW 72ND AVE
SW 77TH AVE
S DIXIE HWY
OLD CUTLER RD


Critical Infrastructure
N
W
E
S
0
0.5
1 Miles
Legend
Outfall
Culvert
Village Boundary
SW 88TH ST
SW 96TH ST
SW 104TH ST
SW 112TH ST
SW 111TH ST
SW 120TH ST
SW 128TH ST
SW 136TH ST
SR 826 EXT
SW 72ND AVE
SW 67TH AVE
SW 62ND AVE
SW 77TH AVE
SW 82ND AVE
SW 57TH AVE
SW 117TH AVE
OLD CUTLER RD


Critical Community & Emergency Facilities
N
W
E
S
0
0.5
1 Miles
Legend
Police Station
Village Hall
Public Work
Fire & Rescue Station
Library
Community Center
Village Boundary
SW 88TH ST
SW 96TH ST
SW 104TH ST
SW 112TH ST
SW 120TH ST
SW 128TH ST
SW 136TH ST
SR 826 EXT
SR 826 S
SW 57TH AVE
SW 62ND AVE
SW 67TH AVE
SW 72ND AVE
SW 77TH AVE
SW 82ND AVE
OLD CUTLER RD


Natural, Cultural, & Historical Assets
N
W
E
S
0
0.5
1 Miles
Legend
Park
Village Boundary
Hidden Pine Park
Linear Park
SW 88TH ST
SW 57TH AVE
SW 96TH ST
Red Road Linear Park
SW 117TH AVE
Flagler Grove Park
Coral Pine Park
SW 104TH ST
Pinecrest Gardens
SW 62ND AVE
Veterans Wayside Park
SW 112TH ST
SW 72ND AVE
SW 67TH AVE
SW 120TH ST
SW 77TH AVE
Evelyn Greer Park
Suniland Park
SW 128TH ST
OLD CUTLER RD
SW 136TH ST

APPENDIX B

KICK-OFF MEETING AGENDA

Meeting Date: **November 09, 2023, 3:00 pm**
Location: **Virtual Meeting**
Project: **Village of Pinecrest – Vulnerability Assessment**
Subject: **Project Kick-Off Meeting**

I. Introduction

1. BCC Key Staff

BCC Engineering, LLC. (Prime Consultant)		
Role	**Name**	**Email**
Principal in Charge	Victor Herrera, PE	vherrera@bcceng.com
Project Manager	Alex Vazquez, PE, CFM	avazquez@bcceng.com
Stormwater Modeler/GIS	Jean Pierre Valle, EI, CFM	jpvalle@bcceng.com
Stormwater Modeler/GIS	Mohammad Shokri, PhD	mshokri@bcceng.com

2. Village Key Staff

Village of Pinecrest (Village)		
Role	**Name**	**Email**
Public Works Director	David J. Mendez, PE	dmendez@pinecrest-fl.gov

II. Scope of Work

1. Project Objectives:

- Conduct a Vulnerability Assessment (VA) to comprehensively determine the specific risks posed to the Village of Pinecrest following FS 380.093 and respective Resilient Florida (RF) Grant Work Plan requirements.

- Assess future potential flooding impacts (Years 2040 and 2070) to critical infrastructure owned and maintained throughout the Village caused by projected increases in:
    - Sea Level Rise
    - Groundwater Rise
    - Rainfall Intensities
    - Storm surges

- Identify risks (sensitivity) of the critical assets.

- Assist the Village with flood protection project grants.

2. Project Scope of Work and Deliverables (6 Tasks – based on FDEP Work Plan)

Task 1 – Acquire Background Data

- Request and collect readily available data from the Village and other governmental agencies.
    - Relevant GIS Data
- Identify critical assets – four Categories:
    - Transportation assets and evacuation routes
    - Critical infrastructure
    - Critical community and emergency facilities
    - Natural/cultural/historic assets
- Finish floor elevations for critical buildings.
    - If not available, assume 8" from the adjacent crown of the road.
- Obtain boundary conditions from Miami Dade County if possible.
- Identify data gaps based on VA requirements outlined in s. 380.093, F.S.
- Prepare Data Catalog and list of additional data needs.
- Prepare and/or update GIS Shapefiles per Resilient Florida Planning Grants Standards

Deliverable: Technical Memorandum No. 1 – Acquire Background Data

Task 2 – Kick-Off Meeting

- Project Kick-Off Meeting Goals:
  - Discuss the project scope, project goals, schedule, key milestones, and deliverables to develop a consistent project approach.
  - Identify potential representatives to serve on the project steering committee.
  - Draft an email to potential steering committee members to request their participation on the committee.

Deliverables:

1. Meeting agenda to include location, date, and time of the meeting;
2. Meeting sign-in sheets or attendance records with attendee names and affiliations;
3. A copy of the presentation(s) and any materials created for distribution at the meeting, as applicable;
4. Kick-off meeting minutes, which document all decisions and agreed-upon outcomes of the meeting;
5. A draft list of steering committee members; and
6. A draft email to potential steering committee members to request their participation on the committee. The email shall include the project purpose, goals, schedule, project meeting dates and locations, and overall desired outcomes.

Task 3 – Exposure Analysis

- Review planning horizons and NOAA 2017 projection curves
  - 2040 Intermediate Low and Intermediate High
  - 2070 Intermediate Low and Intermediate High
- Groundwater rise projection values for each sea level rise scenario.
- Increased rainfall intensities for each sea level rise scenario
- Storm surge scenarios:
  - Cat 1 Storm with rainfall
  - Cat 2 Storm with rainfall
- Develop PC-SWMM Model
- Develop flood maps for each sea level rise scenario.
- Develop flood maps for each sea level rise scenario.
- Prepare and/or update GIS Shapefiles per Resilient Florida Planning Grants Standards

Deliverable: Technical Memorandum No. 2 - Exposure Analysis with the relevant GIS data

Task 4 – Sensitivity Analysis

- Assess the impact of flooding on assets for each future scenario.
- Update critical asset inventory with relevant impact information for each future scenario.

Deliverable: Technical Memorandum No. 3 - Sensitivity Analysis with the relevant GIS Inventory/Database

Task 5 – Identification of Focus Areas

- Identify focus areas based on the results of exposure and sensitivity analysis.

Deliverable: Technical Memorandum No. 4 - Identification of Focus Areas with the relevant GIS Inventory/Database

Task 6 – Final Vulnerability Assessment (VA) Report

- Prepare a draft version of the final Vulnerability Assessment report by combining all the technical memorandums from previous tasks and addressing the comments of the Village.
- Comments and questions received on the DRAFT report will be incorporated into the final VA report document.

Deliverable: DRAFT/FINAL VA Report & Pertinent GIS Files

3. Potential Public Meetings:

Public Meeting No. 1 –

- The purpose of the first meeting is to allow the public to provide input during the initial data collection stages, including input on preferred methodologies, data for analyzing potential sea level rise impacts and/or flooding, guiding factors to consider, and critical assets important to the community (Task 1 and kick-off meeting).
- The Grantee will prepare all social media notifications, meeting invitations, meeting materials, presentations, and graphics utilized during the meeting, as applicable.
- FDEP would like the meeting to be recorded.

Public Meeting No. 2 –

- The purpose of the first meeting is to allow the public to provide input during the initial data collection stages, including input on preferred methodologies, data for analyzing potential sea level rise impacts and/or flooding, guiding factors to consider, and critical assets important to the community (Task 3, 4, and 5).
- The Grantee will prepare all social media notifications, meeting invitations, meeting materials, presentations, and graphics utilized during the meeting, as applicable.

4. Schedule

Deliverable Schedule: (see attached project schedule)

NTP: July 1, 2023
Project Complete: March 29, 2024
Grant Completion Date: March 31, 2024 – May need a time extension

Deliverable Task	Description	Dates
1	Task 1 – Acquire Background Data (TM1)	12/5/23
2	Task 2 – Kick-Off Meeting – required deliverables	11/9/23
3	Task 3 – Exposure Analysis (TM2)	2/9/24
4	Task 4 – Sensitivity Analysis (TM3)	3/8/24
5	Task 5 – Identification of Focus Areas (TM4)	3/22/24
6	Task 6 – Final Vulnerability Assessment Report (draft and final)	3/29/24

5. Invoicing

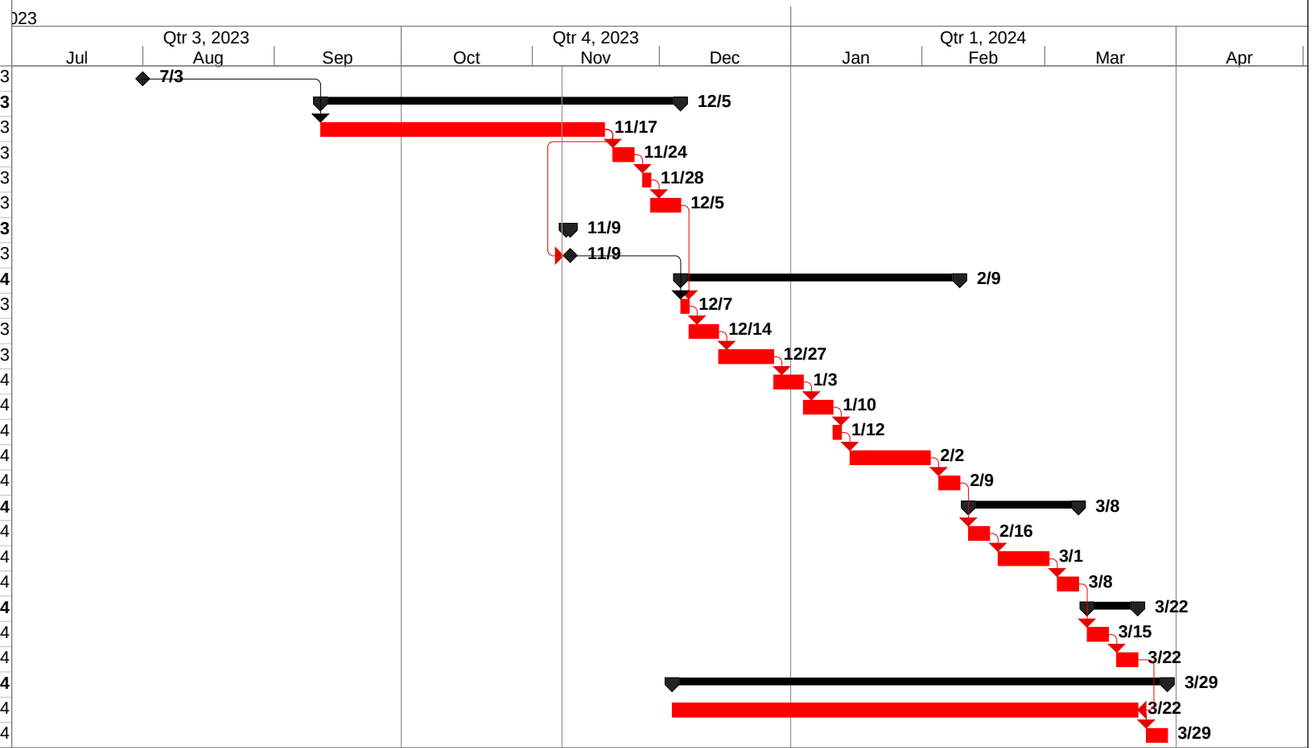
- Monthly invoicing on a time and material basis
- Request Grant reimbursement after each submittal
    - Required deliverable
    - GIS data

MEETING CALL-IN SHEET			
Project:	Village of Pinecrest Vulnerability Assessment	**Meeting Date:**	November 9, 2023
Purpose:	Kick-off Meeting	**Place/Room:**	Virtual Meeting

Name	Organization	E-Mail
David Mendez	Village of Pinecrest	dmendez@pinecrest-fl.gov
Erin Emmons	Kimley-Horn	erin.emmons@kimley-horn.com
Amber Crane	Kimley-Horn	amber.crane@kimley-horn.com
Kyle Pote	Kimley-Horn	kyle.pote@kimley-horn.com
Alex Vazquez	BCC	avazquez@bcceng.com
Mohammad Shokri	BCC	mshokri@bcceng.com
Jean Pierre Valle	BCC	jpvalle@bcceng.com

VILLAGE OF PINECREST
VULNERABILITY ASSESSMENT
SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**NTP**	21 days	Mon 7/3/23	Mon 7/31/23
2	**Task 1 – Acquire Background data**	**61 days**	**Tue 9/12/23**	**Tue 12/5/23**
3	Request and collect available data	49 days	Tue 9/12/23	Fri 11/17/23
4	Review available information and identify data gaps	5 days	Mon 11/20/23	Fri 11/24/23
5	Prepare data catalog and list of additional data needs	2 days	Mon 11/27/23	Tue 11/28/23
6	Prepare technical memorandum summarizing work effort	5 days	Wed 11/29/23	Tue 12/5/23
7	**Task 2 – Kick Off Meeting**	**1 day**	**Thu 11/9/23**	**Thu 11/9/23**
8	Project Kick off Meeting	1 day	Thu 11/9/23	Thu 11/9/23
9	**Task 3 – Exposure Analysis**	**48 days**	**Wed 12/6/23**	**Fri 2/9/24**
10	Review planning horizons and NOAA projection curves	2 days	Wed 12/6/23	Thu 12/7/23
11	Determine sea level/groundwater rise projection values for each future scenario	5 days	Fri 12/8/23	Thu 12/14/23
12	Develop PC-SWMM Model	9 days	Fri 12/15/23	Wed 12/27/23
13	Debug/troubleshoot updated ICPRv4 H&H model	5 days	Thu 12/28/23	Wed 1/3/24
14	Perform design storm simulations for each future scenario	5 days	Thu 1/4/24	Wed 1/10/24
15	Process model results and prepare inundation flood maps for each future scenario	2 days	Thu 1/11/24	Fri 1/12/24
16	Prepare and/or update GIS shapefiles per Resilient Florida Planning Grants standards	15 days	Mon 1/15/24	Fri 2/2/24
17	Prepare technical memorandum summarizing work effort	5 days	Mon 2/5/24	Fri 2/9/24
18	**Task 4- Sensitivity Analysis**	**20 days**	**Mon 2/12/24**	**Fri 3/8/24**
19	Assess impact of flooding on assets for each future scenario	5 days	Mon 2/12/24	Fri 2/16/24
20	Update critical asset inventory with relevant impact information for each future scenario	10 days	Mon 2/19/24	Fri 3/1/24
21	Prepare technical memorandum summarizing work effort	5 days	Mon 3/4/24	Fri 3/8/24
22	**Task 5 - Identification of Focus Areas**	**10 days**	**Mon 3/11/24**	**Fri 3/22/24**
23	Identify focus areas	5 days	Mon 3/11/24	Fri 3/15/24
24	Prepare technical memorandum summarizing work effort	5 days	Mon 3/18/24	Fri 3/22/24
25	**Task 6 - Final Vulnerability Assessment (VA) Report**	**85 days**	**Mon 12/4/23**	**Fri 3/29/24**
26	Prepare Draft Vulnerability Assessment (VA) Report	80 days	Mon 12/4/23	Fri 3/22/24
27	Prepare Final Vulnerability Assessment (VA) Report	5 days	Mon 3/25/24	Fri 3/29/24



Project: Village of Pinecrest SWMMP
Update Date: Wed 11/8/23

Task		Rolled Up Critical Task		Project Summary		Duration-only		External Tasks	
Critical Task		Rolled Up Milestone	◇	Group By Summary		Manual Summary Rollup	◆	External Milestone	
Milestone	◆	Rolled Up Progress		Inactive Milestone		Manual Summary	◆	Progress	
Summary		Split		Inactive Summary		Start-only		Deadline	⇩
Rolled Up Task		External Tasks		Manual Task	◇	Finish-only			

MINUTES FOR PROGRESS MEETING

Meeting Date:	**November 9, 2023**
Location:	**Virtual Meeting**
Project:	**Village of Pinecrest Vulnerability Assessment (VA)**
Subject:	**Kickoff Meeting**

A virtual meeting was held with Village staff to discuss the tasks and data needs for the Village of Pinecrest Vulnerability Assessment project. The following is a summary of the various items discussed:

- Mr. Vazquez followed the attached meeting agenda topics.

- Mr. Vazquez discussed the project's objectives, scope, or work as outlined in the FDEP Grant Work Plan, schedule, and importance in the context of seeking funding for flood mitigation in the future. A copy of the project schedule is attached to these meeting minutes.

- During the discussion of Task 2, the requirement of establishing a steering committee, as stated in the final work plan, was considered. Mr. Mendez indicated that the following individuals will make up the committee:

    - David Mendez, Public Works Director
    - Chris Revilla, Assistant Village Manager
    - Eduarod Poza, Administrative Service Manager

- As requested by the Grant Work Plan, BCC will draft an email to steering committee members to request their participation on the committee. The email will include the project purpose, goals, schedule, project meeting dates and locations, and overall desired outcomes.

- Concerning the critical infrastructure elements, the following details were provided:

    - There is a single evacuation route running from North to South.
    - Although there is a trolley system, it is exclusively for school transportation.
    - Lift stations are present but are not under the Village's ownership.

- Mr. Vazquez stated that the Village is located within two major basins: C-100 and C-2 basins. He also stated that the County has recently completed updates to these two basins' hydrologic/hydraulic models. Mr. Vazquez stated that it would be helpful to obtain time-stage boundary conditions at the locations where the C-100 and C-2 canals enter and discharge flows to and from the Village, to support the Exposure Analysis task. Mr. Mendez requested that BCC provide a map and date to be requested from the County.

- Ms. Emmons mentioned that Kimley Horn has elevation certificates for the Village's buildings. They will also provide the necessary GIS datasets for the critical infrastructures within the Village.

- BCC will provide Kimley Horn with the required GIS Data to support the Vulnerability Assessment Report. Ms. Emmons also stated they would provide all the critical GIS data, including the proposed critical Village assets.

Action Items:

1. BCC will provide the GIS data request to Kimley-Horn (Completed).

2. Kimley Horn to provide the requested GIS data by BCC (Completed).

3. BCC will draft an email to the steering committee members as outlined in the Work Plan. (Completed)

4. BCC will provide the Village with the boundary condition locations where time-stage data is needed (Completed).

5. BCC will provide a map of the location and data needed from the County for the C-100 and C-2 basins (Completed).

6. The Village will contact Miami Dade County to inquire about the availability of the time-stage data for the Hydraulic models (Competed).

7. BCC will be providing the draft of Task 1 to the Village for review. (Completed)

Meeting Participants:

- David Mendez – Village of Pinecrest
- Erin Emmons – Kimley-Horn
- Amber Crane – Kimley-Horn
- Kyle Pote – Kimley-Horn
- Alex Vazquez – BCC
- Mohammad Shokri - BCC
- Jean Pierre Valle - BCC

Alex Vazquez

To: David J. Mendez (PW); Chris Revilla; Eduardo Pozas (OVM)
Subject: Village of Pinecrest Vulnerability Assessment Steering Committee
Attachments: 1. 22PLN63 VILLAGE OF PINECREST VA Grant Work Plan.pdf; Schedule - Pinecrest VA_11-09-2023_2.pdf

You have been identified as a potential steering committee member for the Village of Pinecrest (Village) Vulnerability Assessment (VA). Below is an overview of the project purpose, goals, tasks, schedule, and tentative project meeting dates.

Project Purpose and Goals

The Florida Legislature has acknowledged the state's susceptibility to adverse effects from flooding, partly due to increased frequency and duration of rainfall, storm surges from severe weather, and rising sea levels/groundwater. Recognizing the need for Vulnerability Assessments to comprehensively evaluate specific risks, especially those associated with flooding and rising sea levels/groundwater, the Legislature emphasized the necessity for a coordinated statewide approach to address these challenges.

In response, the Florida Department of Environmental Protection (FDEP) established the Resilient Florida (RF) Grant Program, enabling the provision of grants to local governments. These grants aim to fund community resilience planning and mandate specific vulnerability assessments for certain local governments. Within this framework, the Village sought funding under the RF Grant Program to conduct a VA evaluating climate change impacts on all critical assets within its jurisdiction. Through a Continuing Professional Engineering Services Agreement, the Village has engaged BCC Engineering, LLC (BCC) to develop the comprehensive VA. This assessment aligns with the requirements stipulated in s. 380.093 FS and encompasses the analysis of sea-level rise, groundwater rise, and increased rainfall impacts on all regionally significant assets within the Village limits.

Project Tasks

As outlined in the VA Work Plan, the VA into six tasks:

- Task 1 Acquiring Background Data
- Task 2 Kick-off Meeting (Coordination Meeting)
- Task 3 Exposure Analysis
- Task 4 Sensitivity Analysis
- Task 5 Identification of Focus Areas
- Task 6 Final Vulnerability Assessment Report (Draft and Final)

A copy of the Grant Work Plan is attached to this email.

Following the completion of each task, BCC will prepare a technical memorandum for Tasks 1 through 5. Each technical memorandum will comprise a section in the Draft VA Report. The Steering Committee Members will have the opportunity to review and provide comments on each of the technical memorandums and the Draft VA Report. Comments on the technical memorandums will be addressed by BCC and incorporated in the Draft VA Report. After receiving comments from the Steering Committee Members on the Draft VA Report, BCC will prepare the Final VA Report. Progress meetings will be held with committee members and essential Village staff at the completion of each task. At these meetings, BCC will provide a status on the progress of the project, provide an overview of the task deliverables, and identify the upcoming activities and updated schedule if applicable. The meetings will be held virtually via MS Teams.

Project Schedule and Anticipate Project Meeting Dates

At the project kick-off meeting, a projection schedule was presented. The project schedule had to be revised due to a delay in obtaining all the critical data associated with Task 1. Attached to this email is the updated schedule. Based on this schedule, the following are the tentative progress meeting dates:

Task 1 Acquiring Background Data	Progress Meeting Date January 30, 2024
Task 2 Kick-off Meeting (Coordination Meeting)	Progress Meeting Date January 30, 2024
Task 3 Exposure Analysis	Progress Meeting Date April 1, 2024
Task 4 Sensitivity Analysis	Progress Meeting Date April 29, 2024
Task 5 Identification of Focus Areas	Progress Meeting Date May 13, 2024
Task 6 Final Vulnerability Assessment Report	Progress Meeting Date May 20, 2024

The actual dates and times of the meeting will be coordinated with the Steering Committee Members based on everyone's availability.

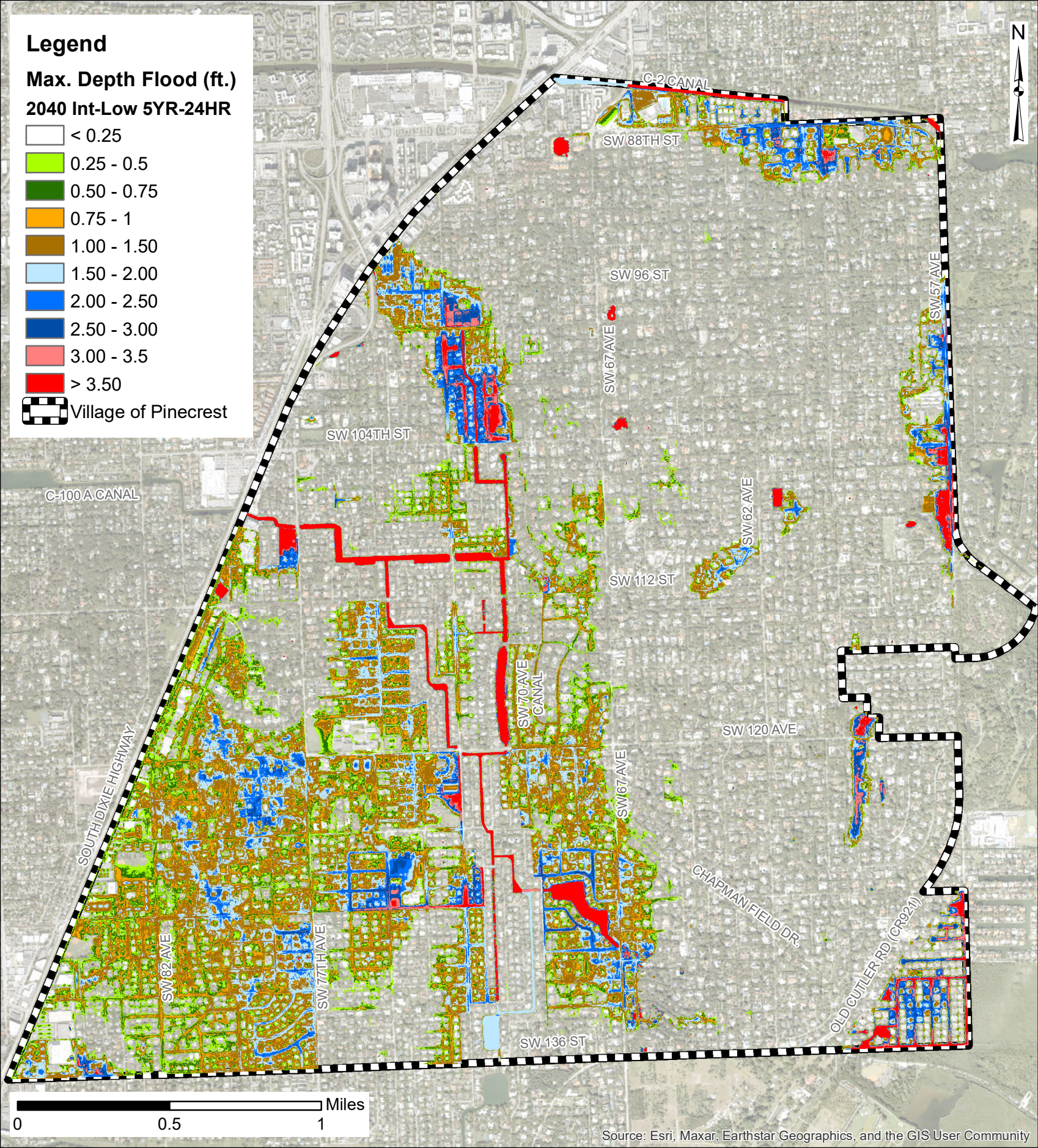
We look forward to working with each of you on this vital project for the Village. Please reach out to me if you have any questions.

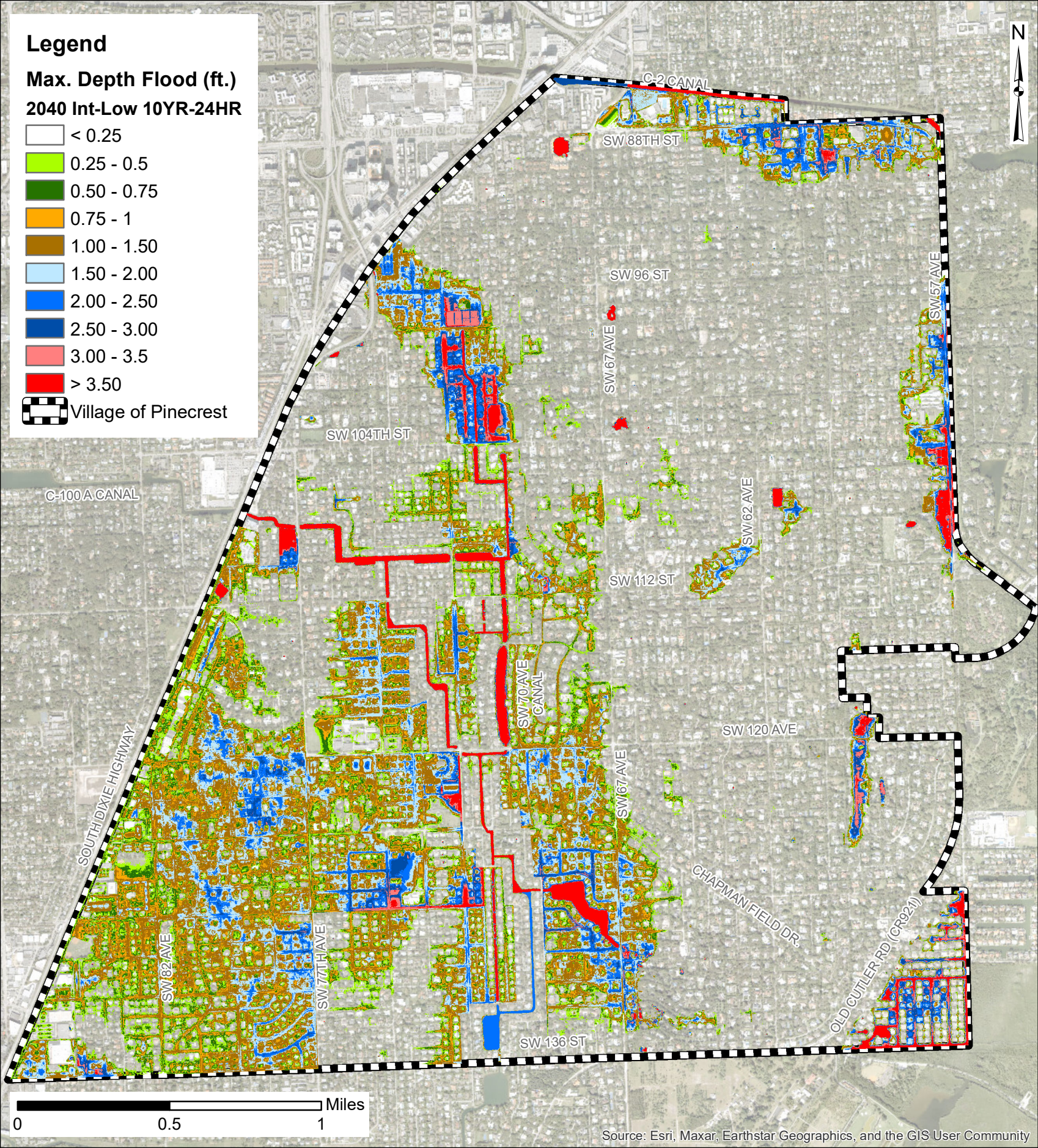
Regards.

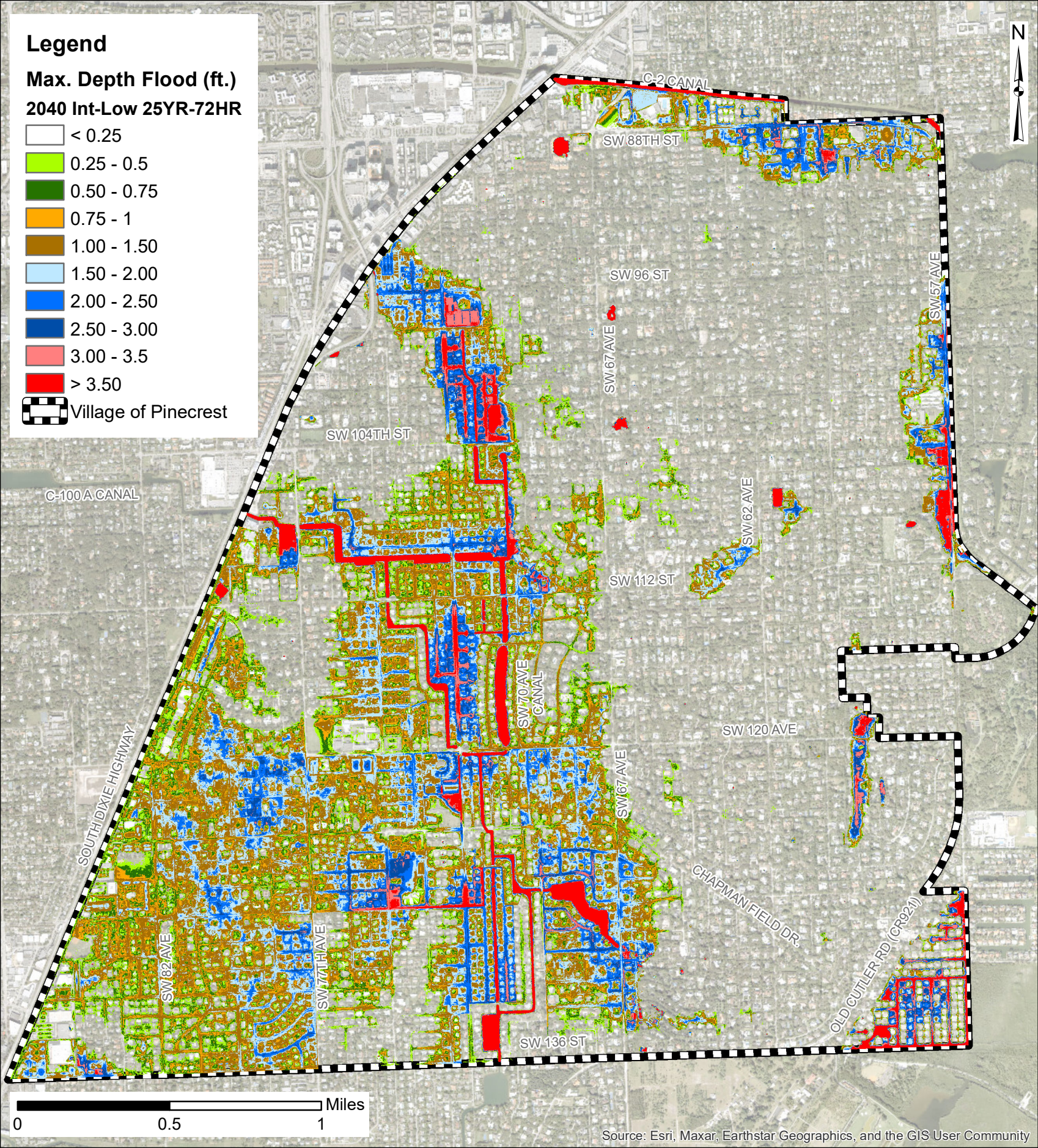
Alex Vazquez, PE, CFM
Director of Water Resources
bcc engineering | GETTING THERE JUST GOT EASIER™
6401 SW 87th Avenue, Suite 200, Miami, FL 33173
t. 305.670.2350 | m. 786.412.2688 | www.bcceng.com

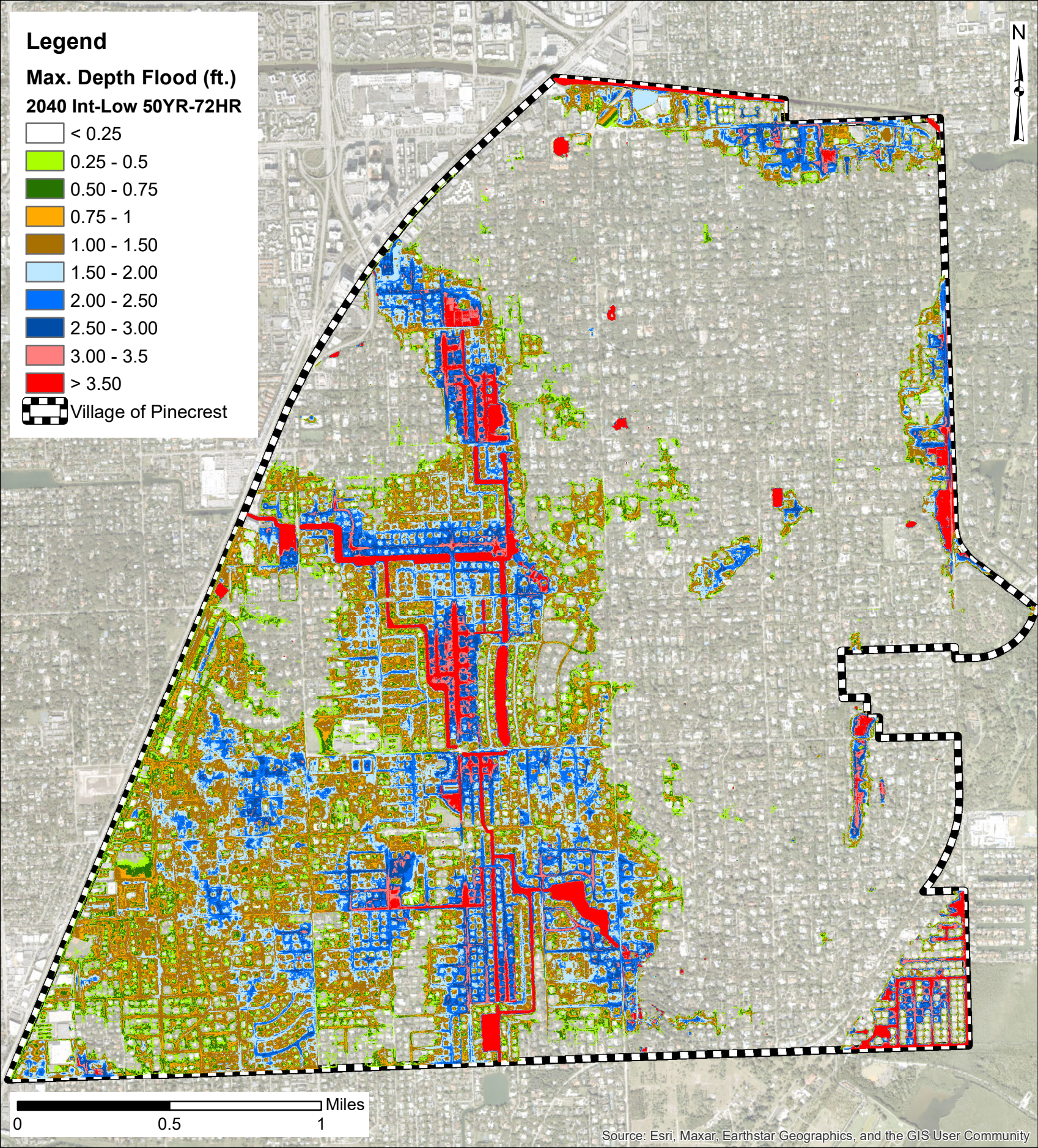
APPENDIX C-1

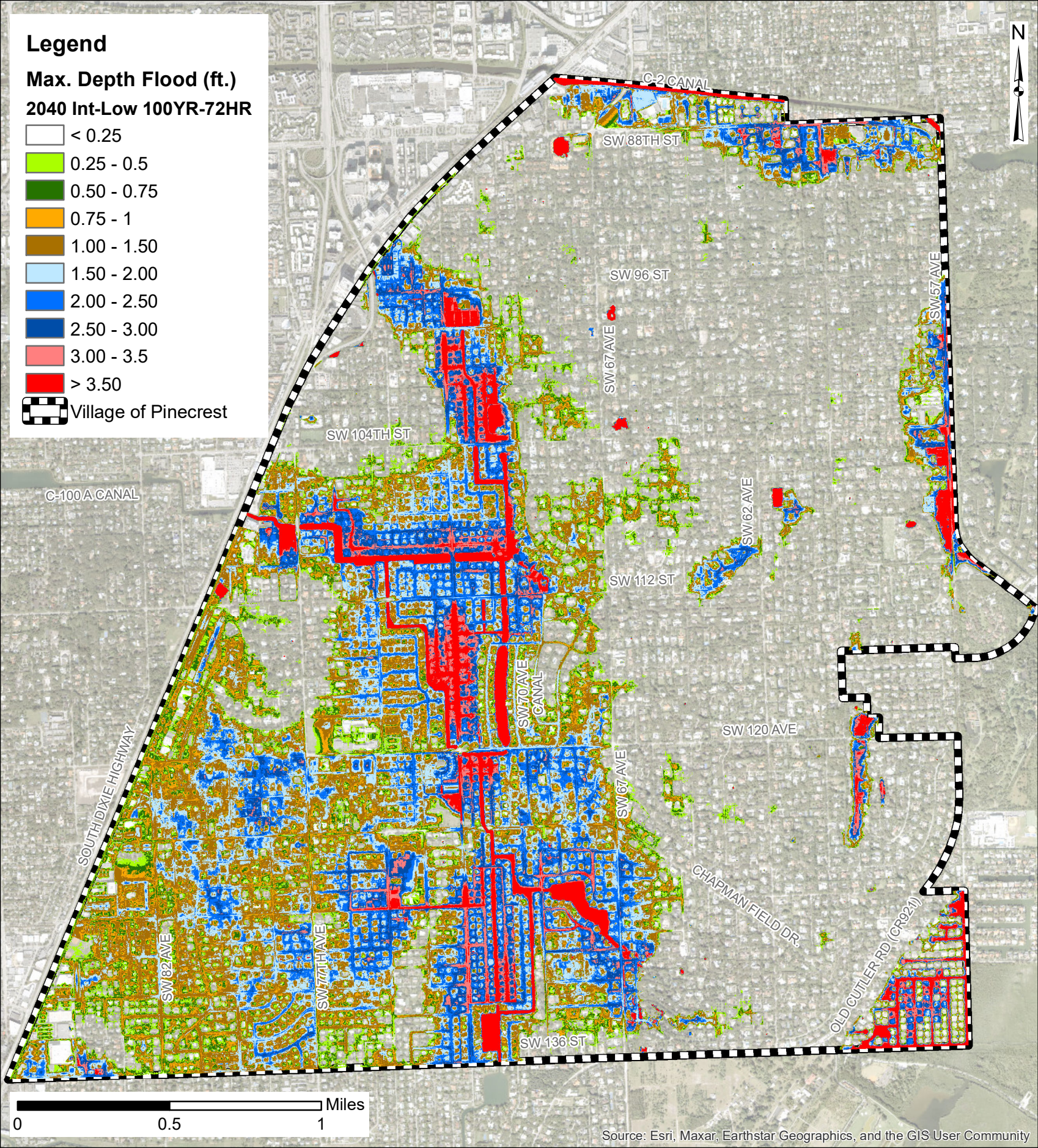
Scenario 1: 2040 Intermediate- Low SLR

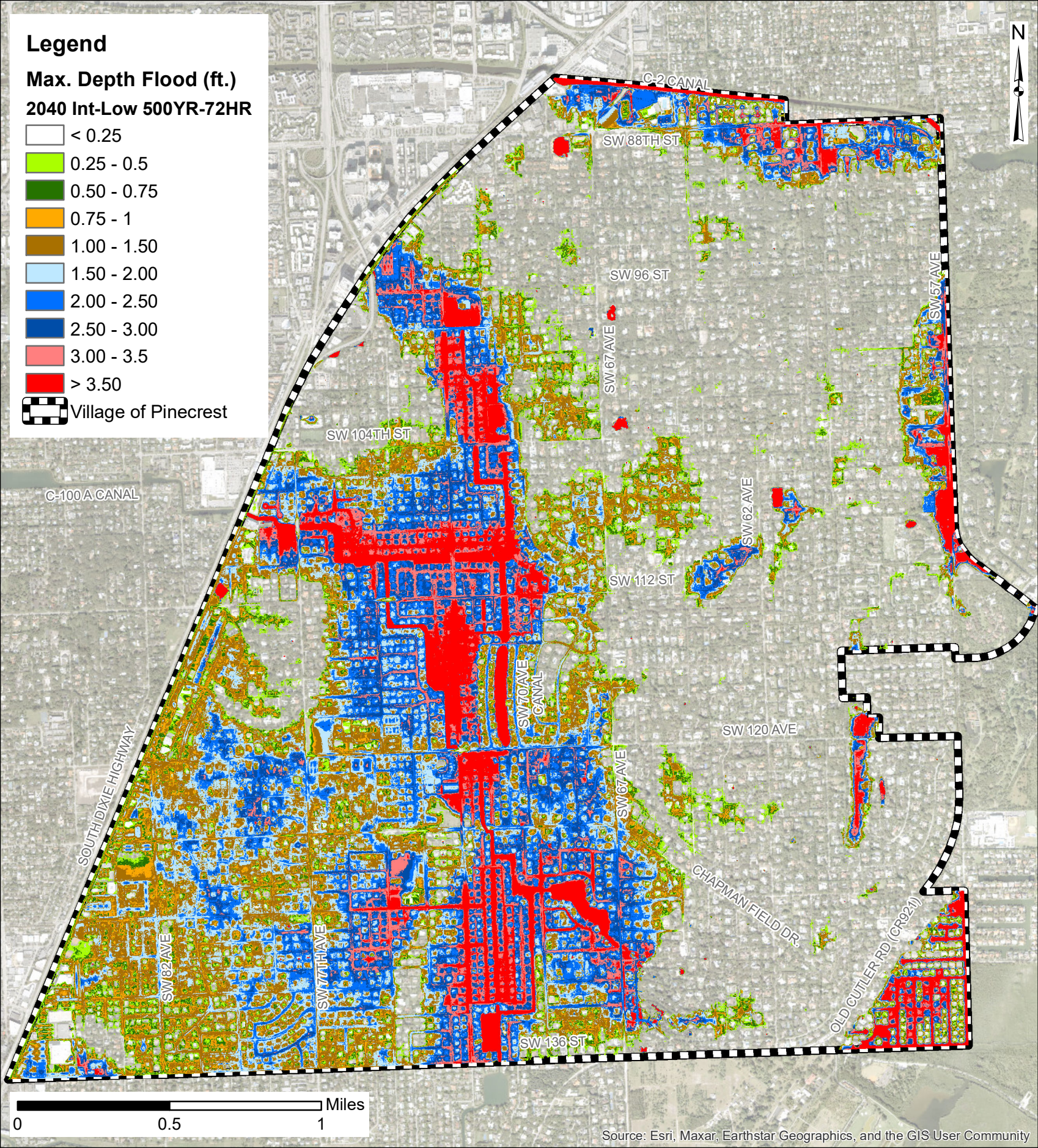

Legend
Max. Depth Flood (ft.)
2040 Int-Low 5YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 924)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Depth Flood (ft.)
2040 Int-Low 10YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 924)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Depth Flood (ft.)
2040 Int-Low 25YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 924)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

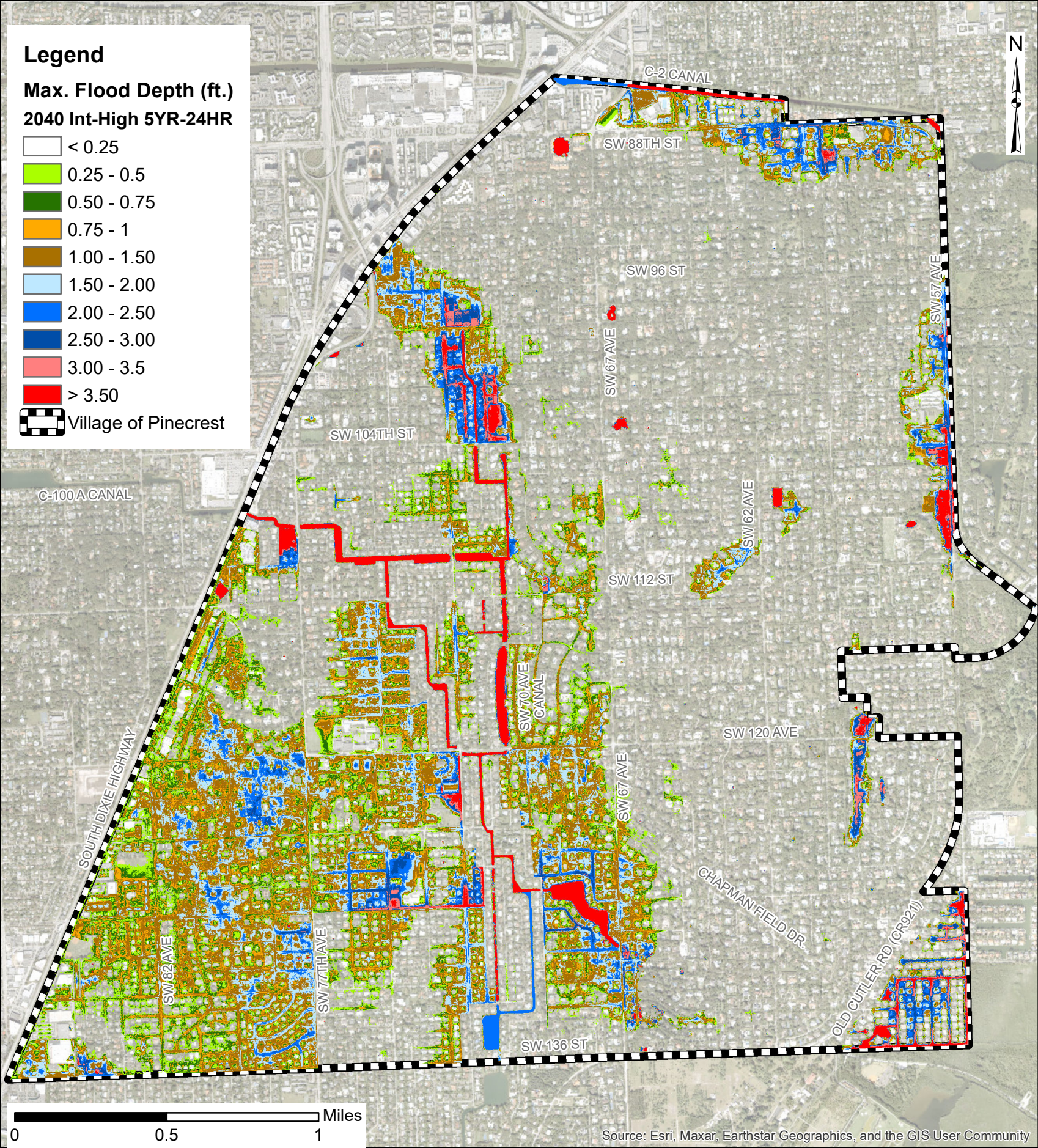

Legend
Max. Depth Flood (ft.)
2040 Int-Low 50YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

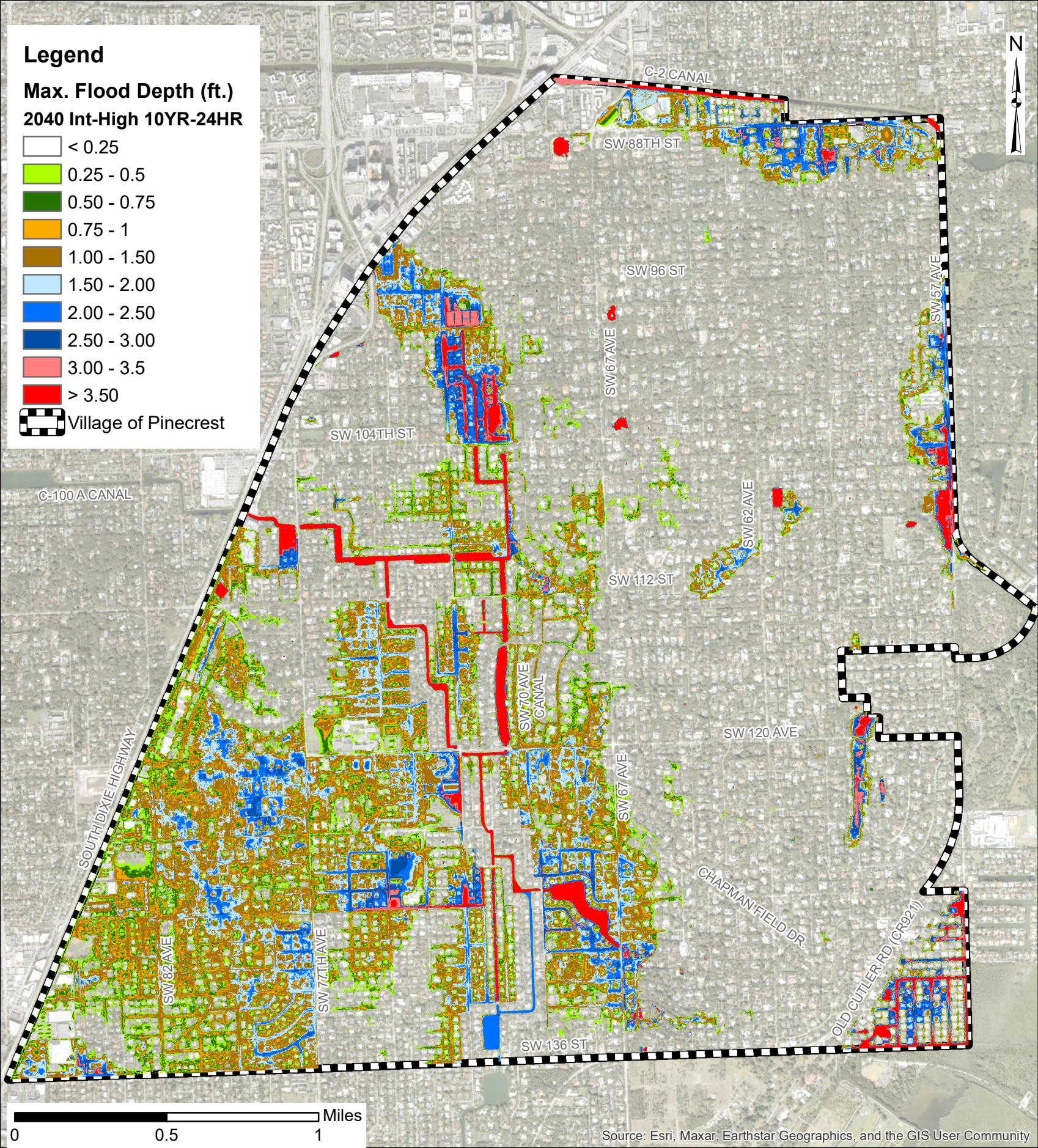

Legend
Max. Depth Flood (ft.)
2040 Int-Low 100YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 924)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

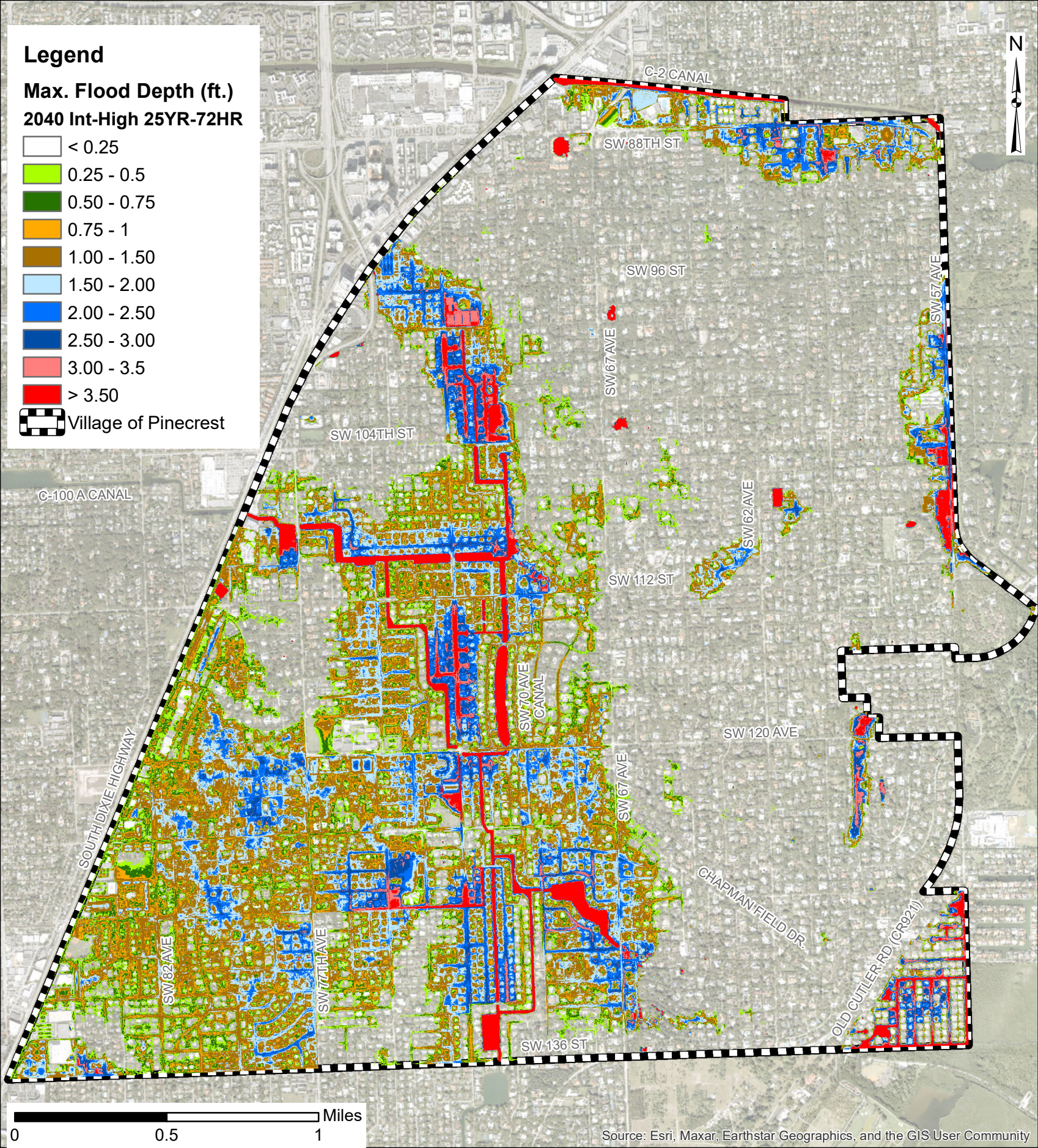

Legend
Max. Depth Flood (ft.)
2040 Int-Low 500YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 67 AVE
CHAPMAN FIELD DR.
SW 82 AVE
SW 77TH AVE
OLD CUTLER RD (CR 924)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

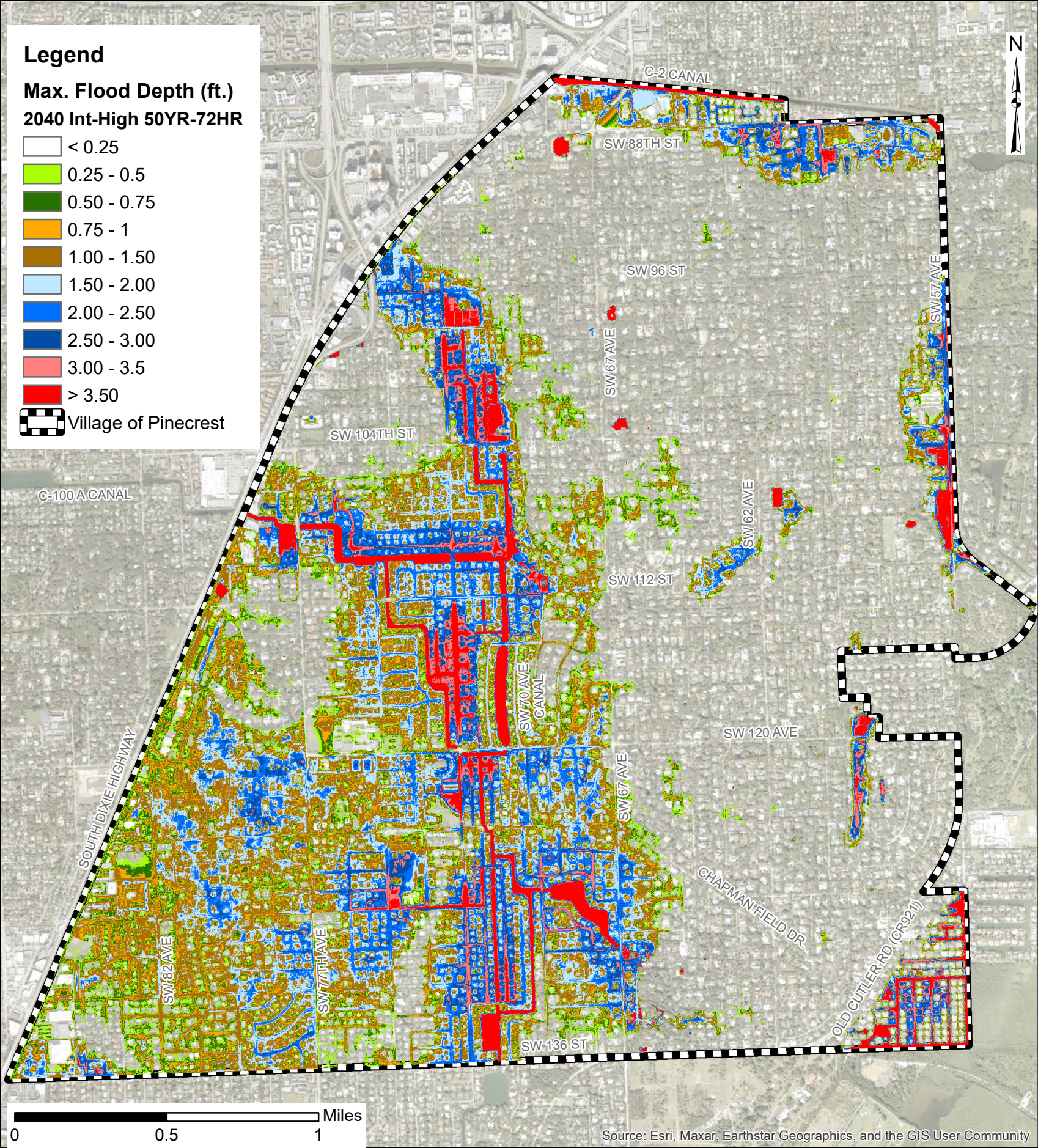
APPENDIX C-2

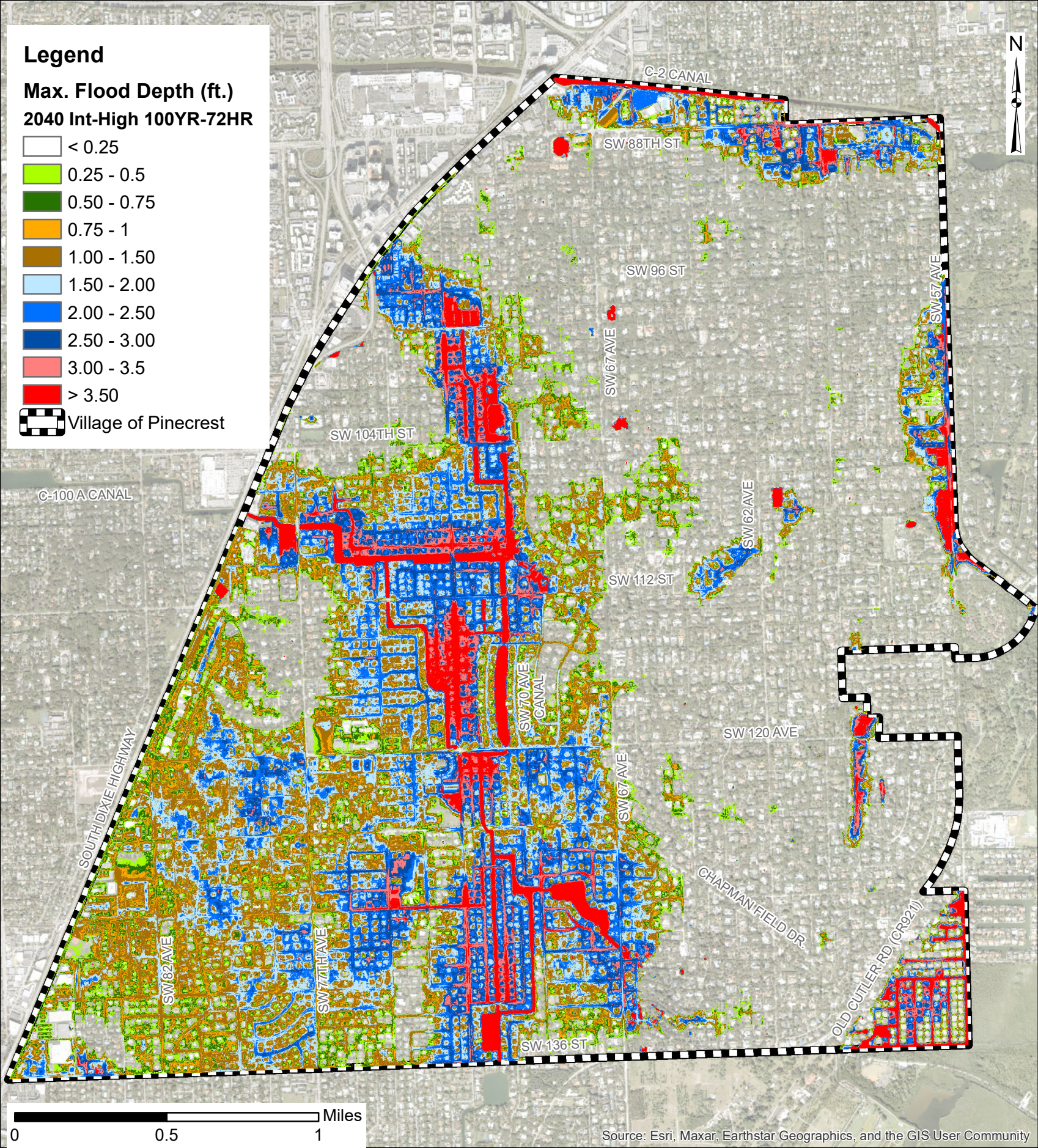
Scenario 2: 2040 Intermediate- High SLR

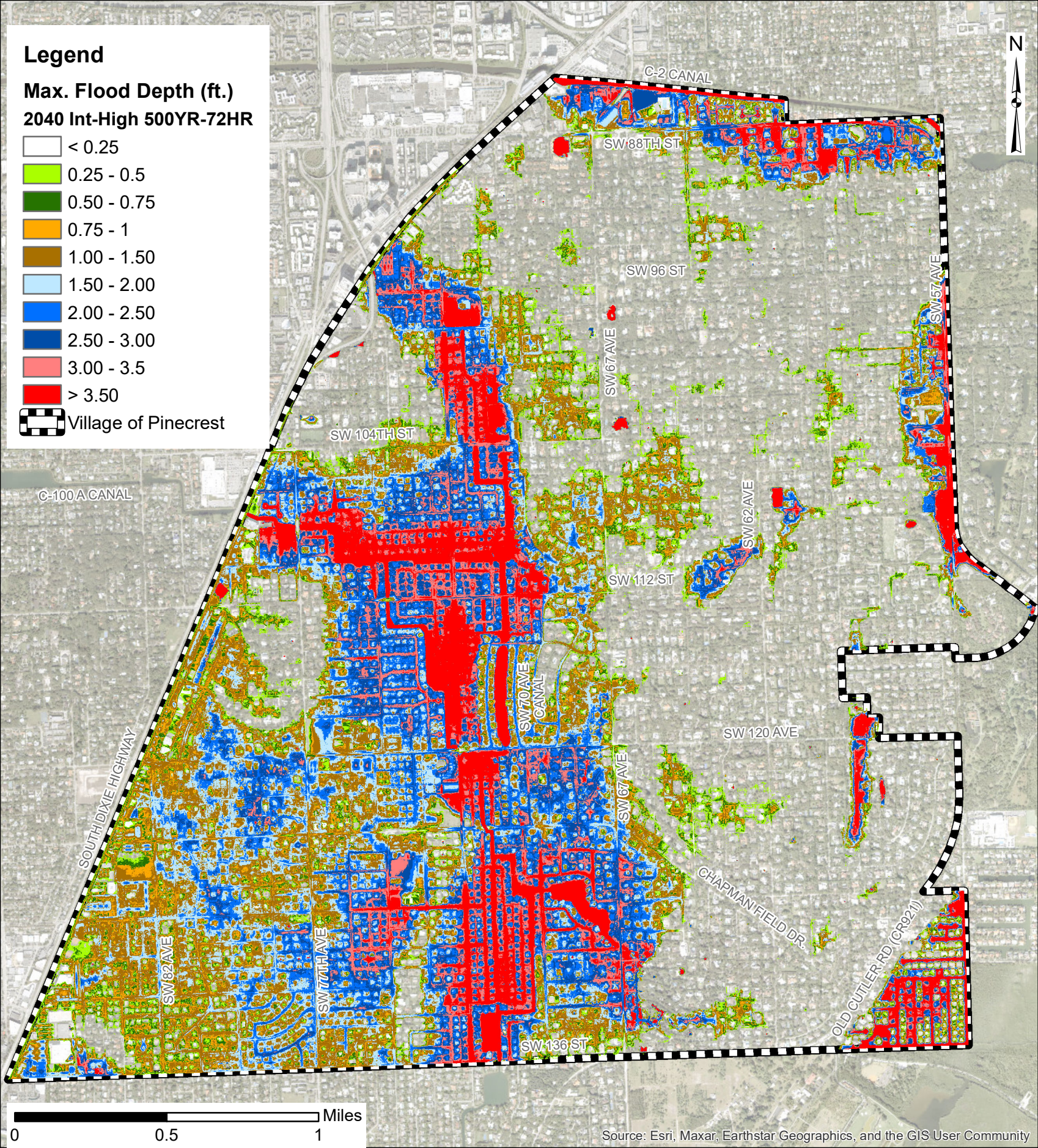

Legend
Max. Flood Depth (ft.)
2040 Int-High 5YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2040 Int-High 10YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2040 Int-High 25YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

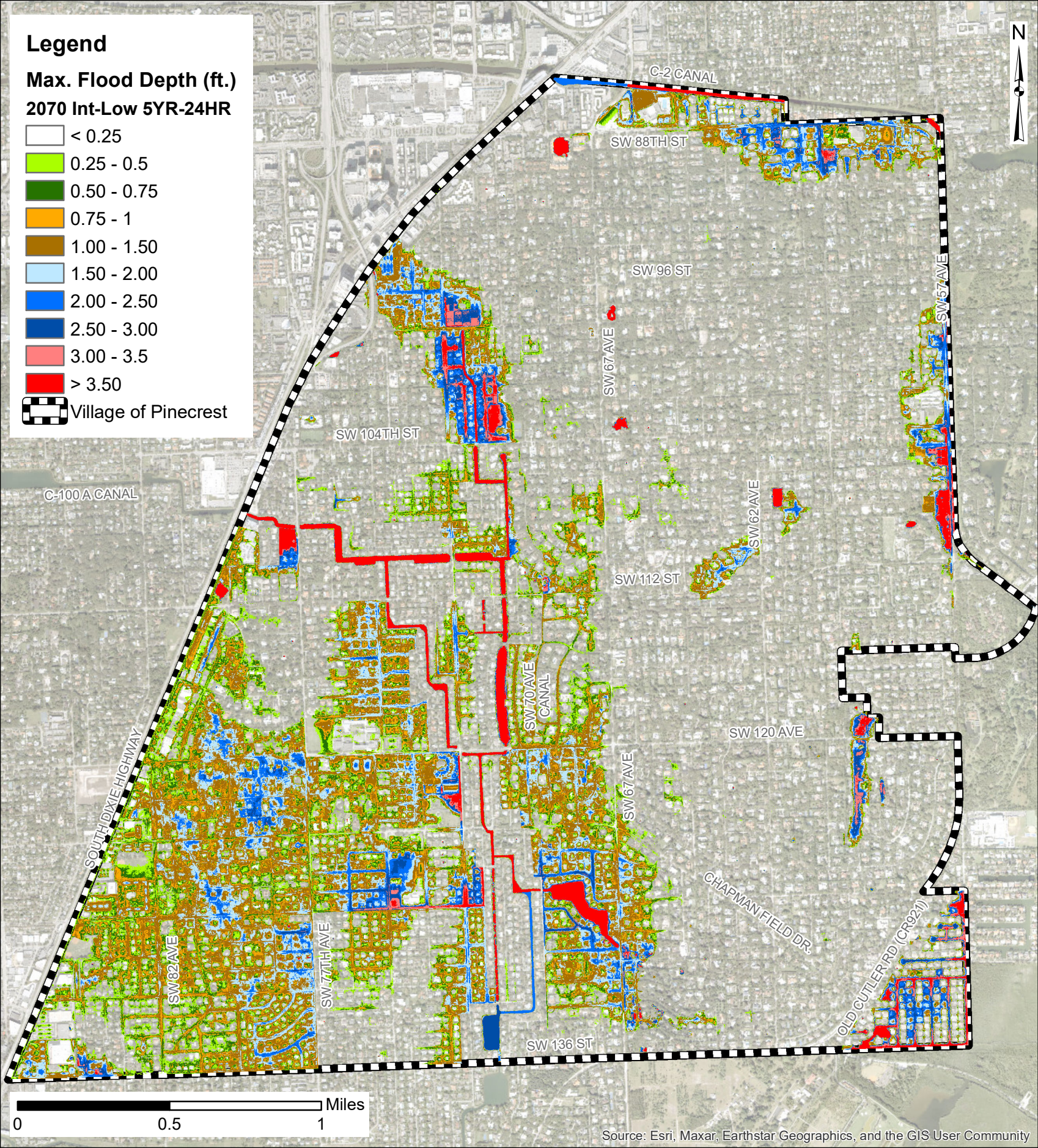

Legend
Max. Flood Depth (ft.)
2040 Int-High 50YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

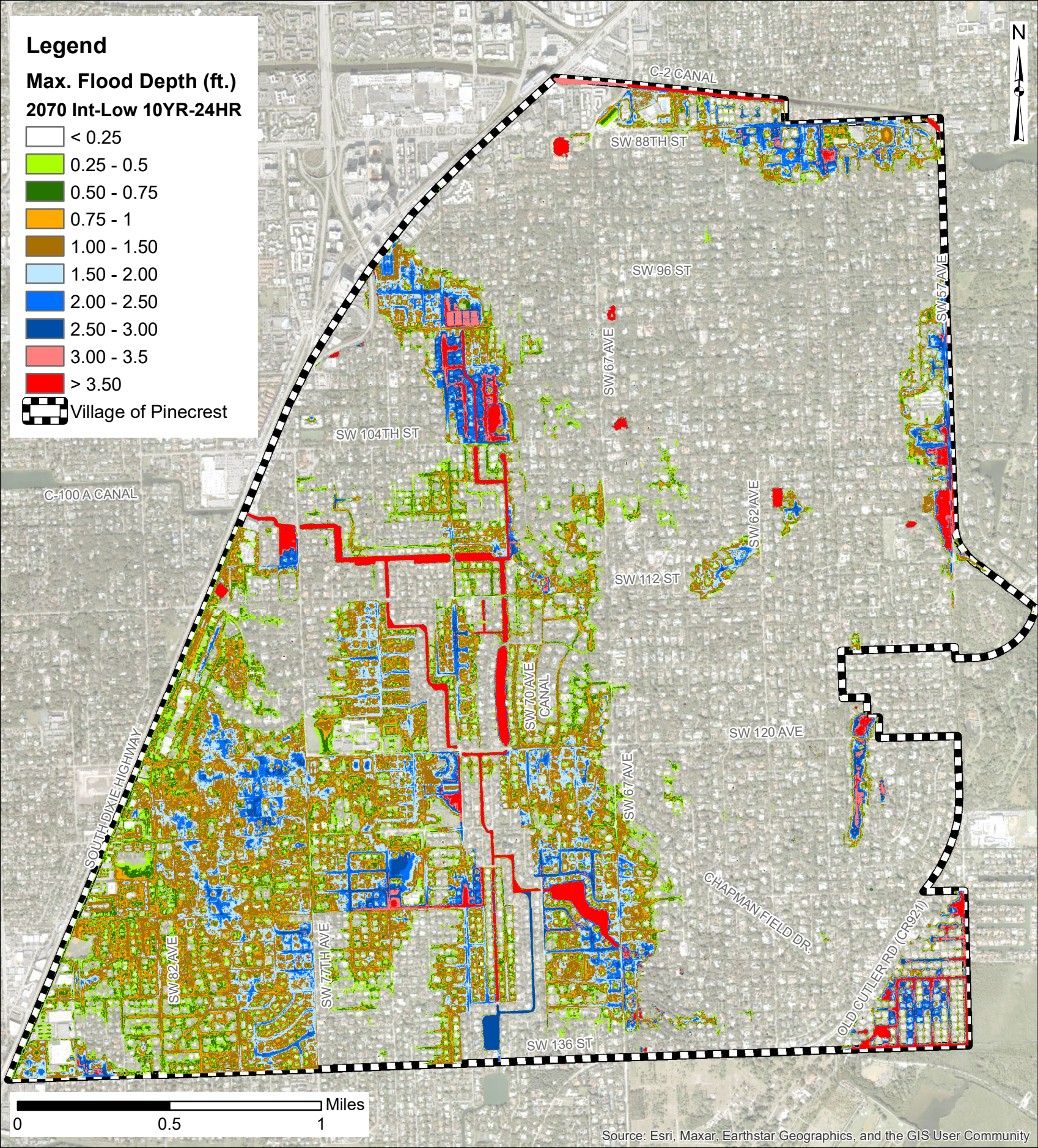

Legend
Max. Flood Depth (ft.)
2040 Int-High 100YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

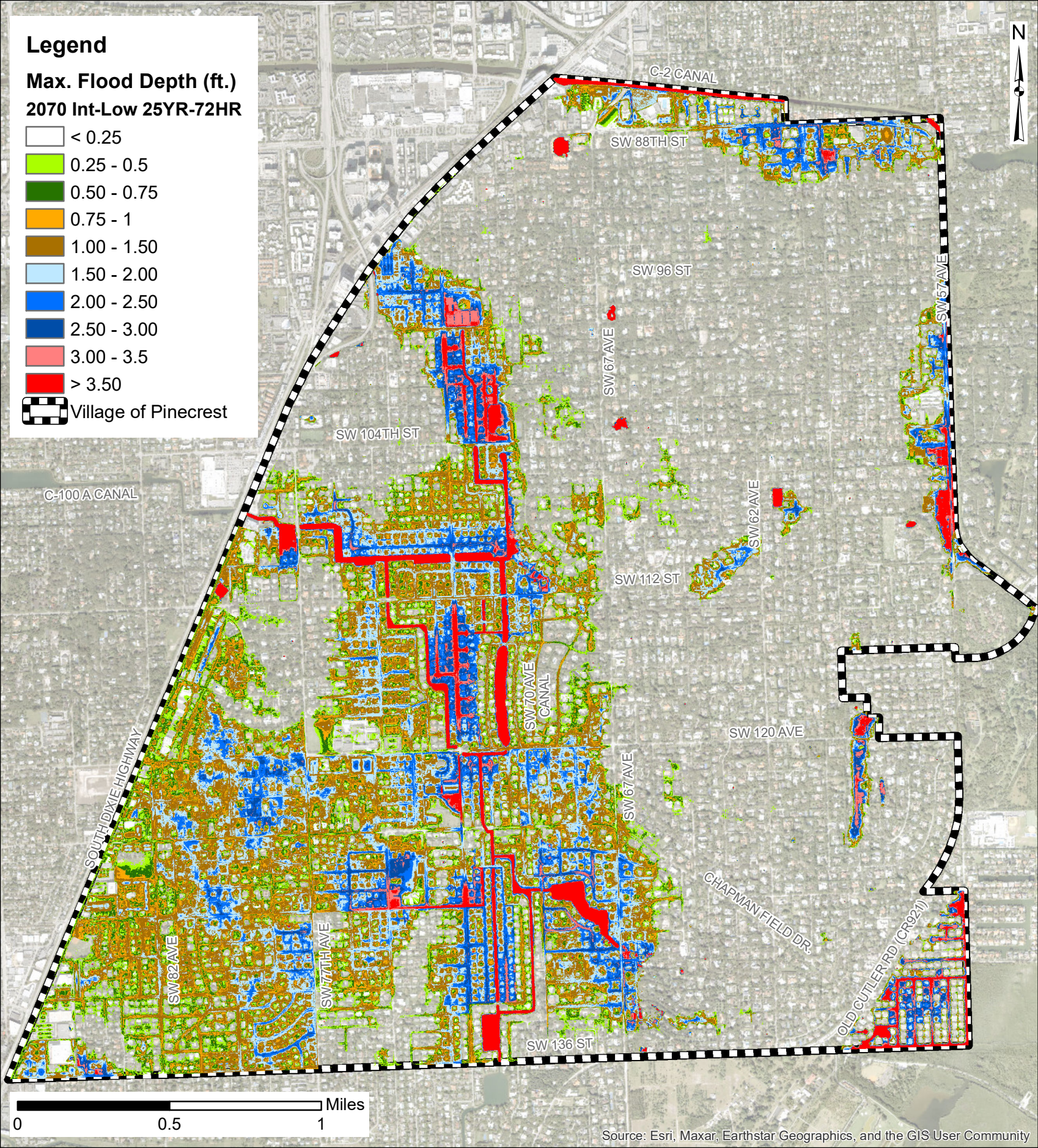

Legend
Max. Flood Depth (ft.)
2040 Int-High 500YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

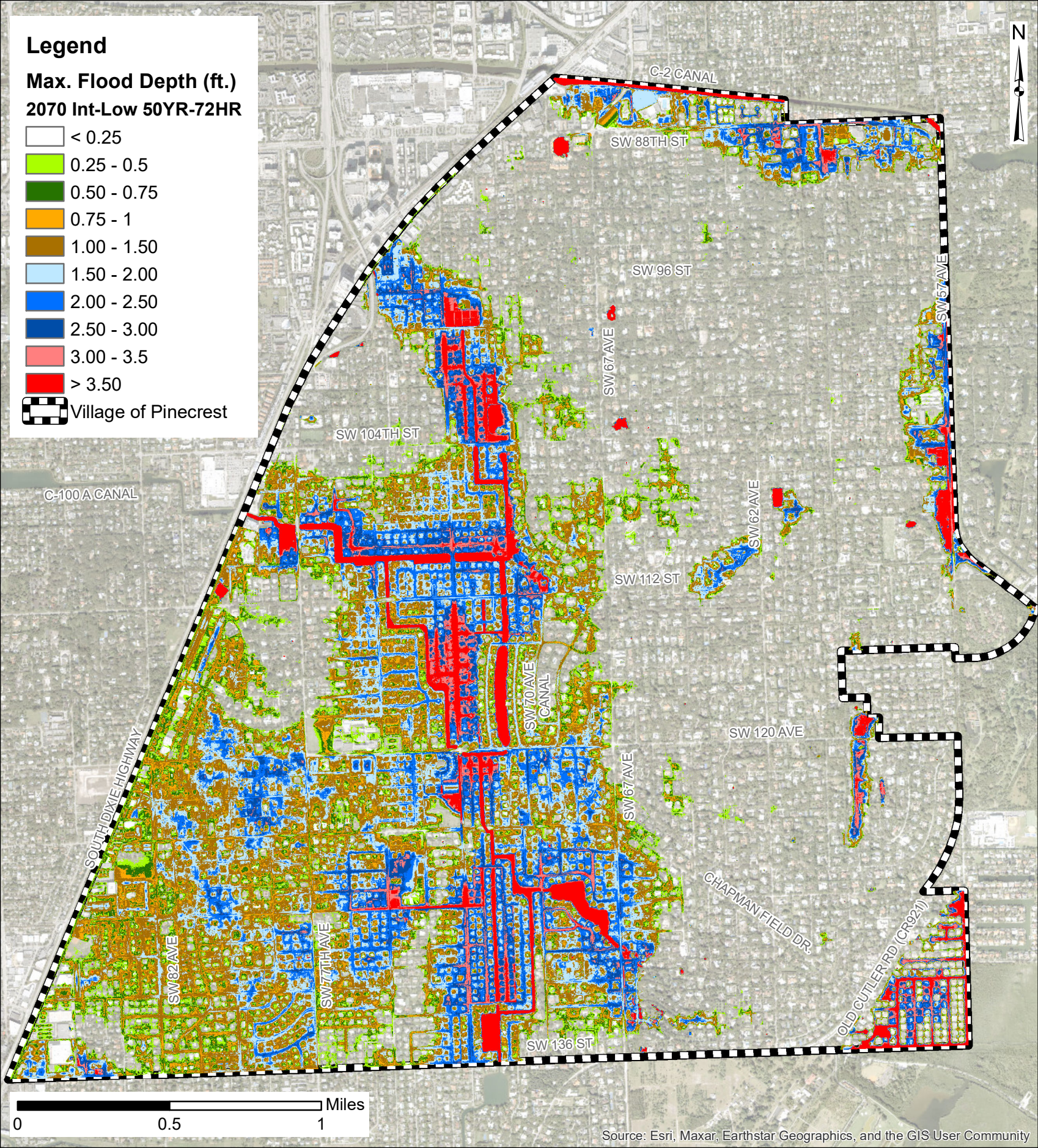
APPENDIX C-3

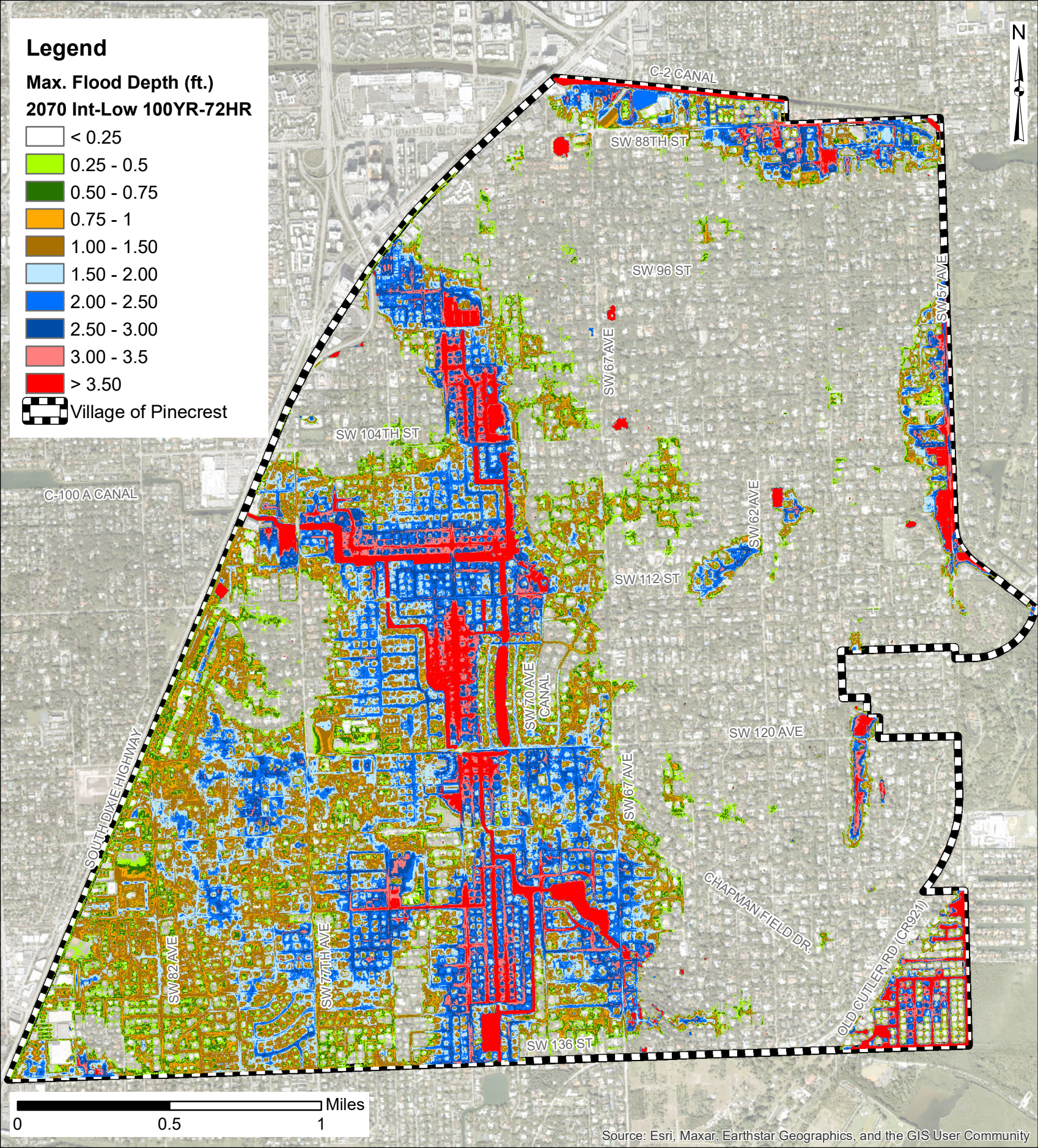
Scenario 3: 2070 Intermediate- Low SLR

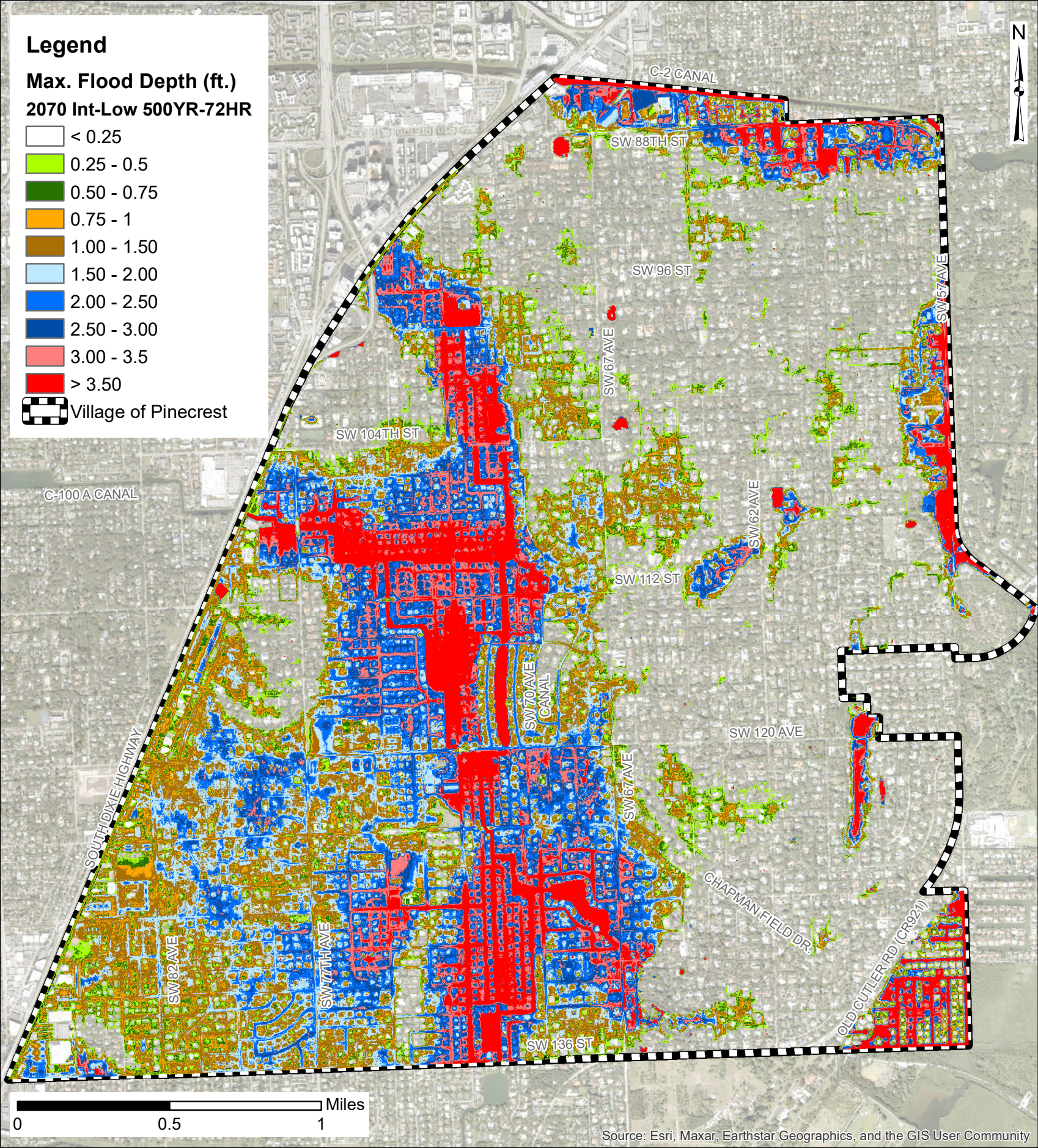

Legend
Max. Flood Depth (ft.)
2070 Int-Low 5YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-Low 10YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 67 AVE
CHAPMAN FIELD DR.
SW 82 AVE
SW 77TH AVE
OLD CUTLER RD (CR 92A)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-Low 25YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR.
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

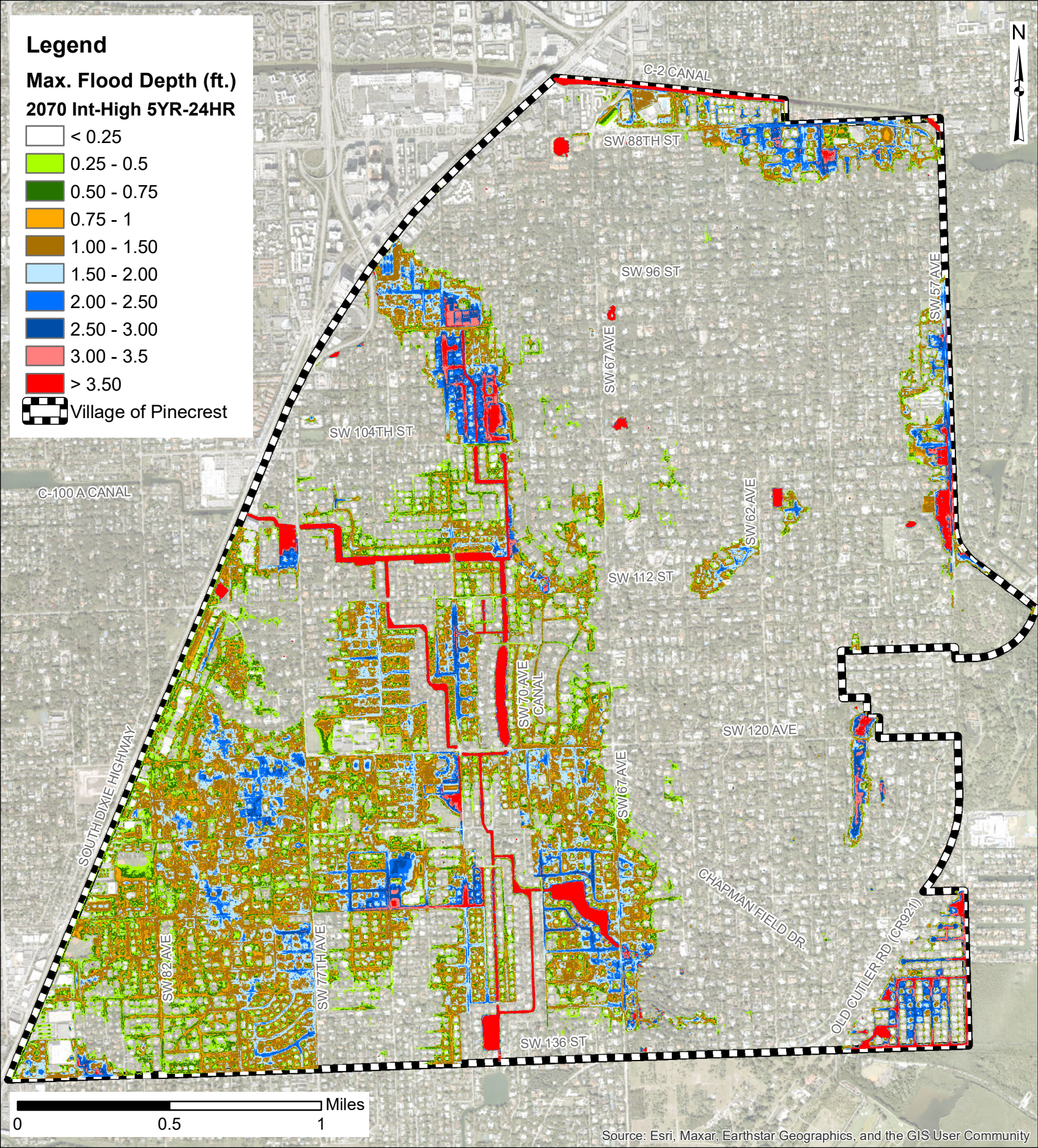

Legend
Max. Flood Depth (ft.)
2070 Int-Low 50YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 67 AVE
CHAPMAN FIELD DR.
SW 82 AVE
SW 77TH AVE
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

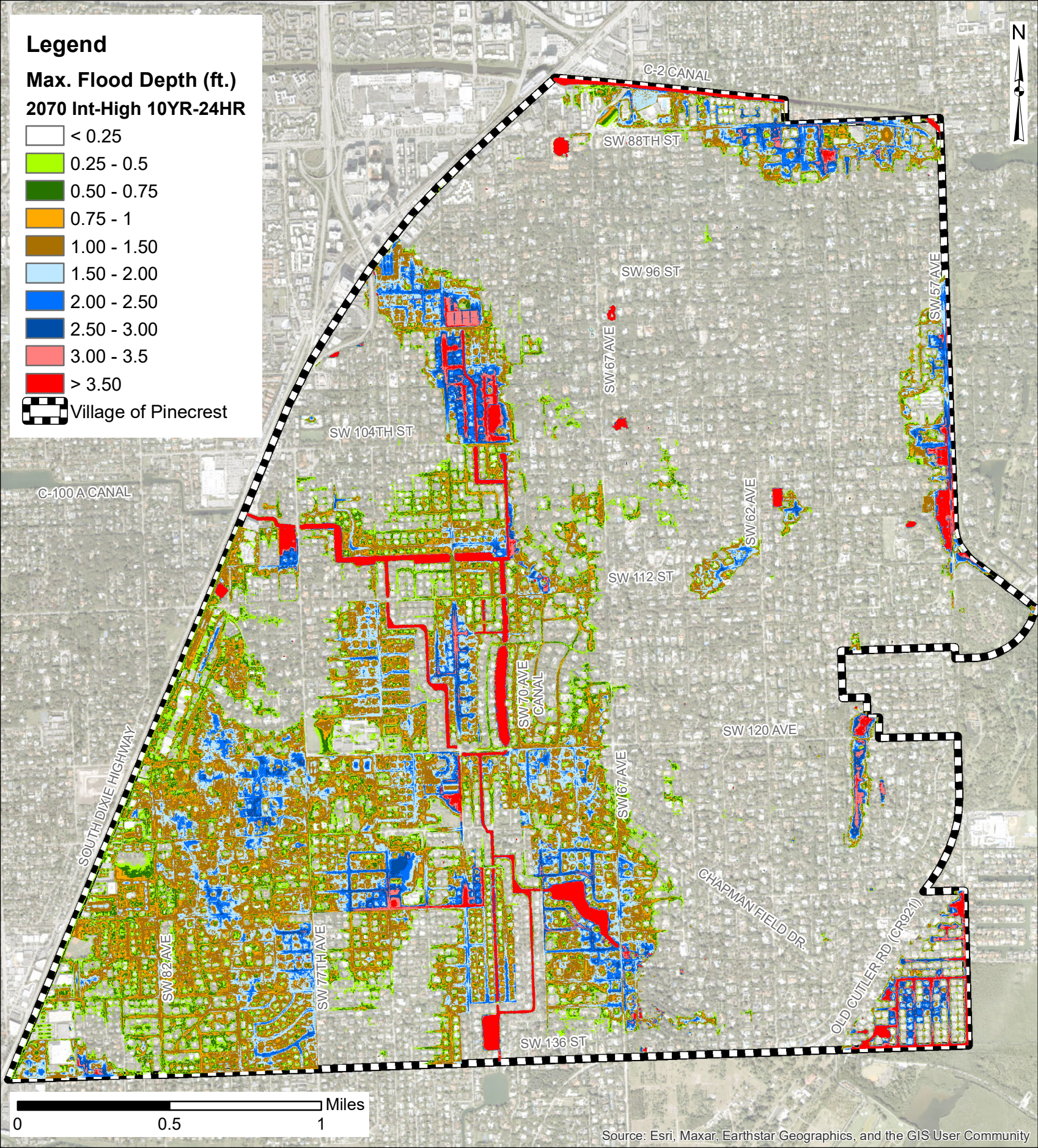

Legend
Max. Flood Depth (ft.)
2070 Int-Low 100YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 67 AVE
CHAPMAN FIELD DR.
SW 82 AVE
SW 77TH AVE
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

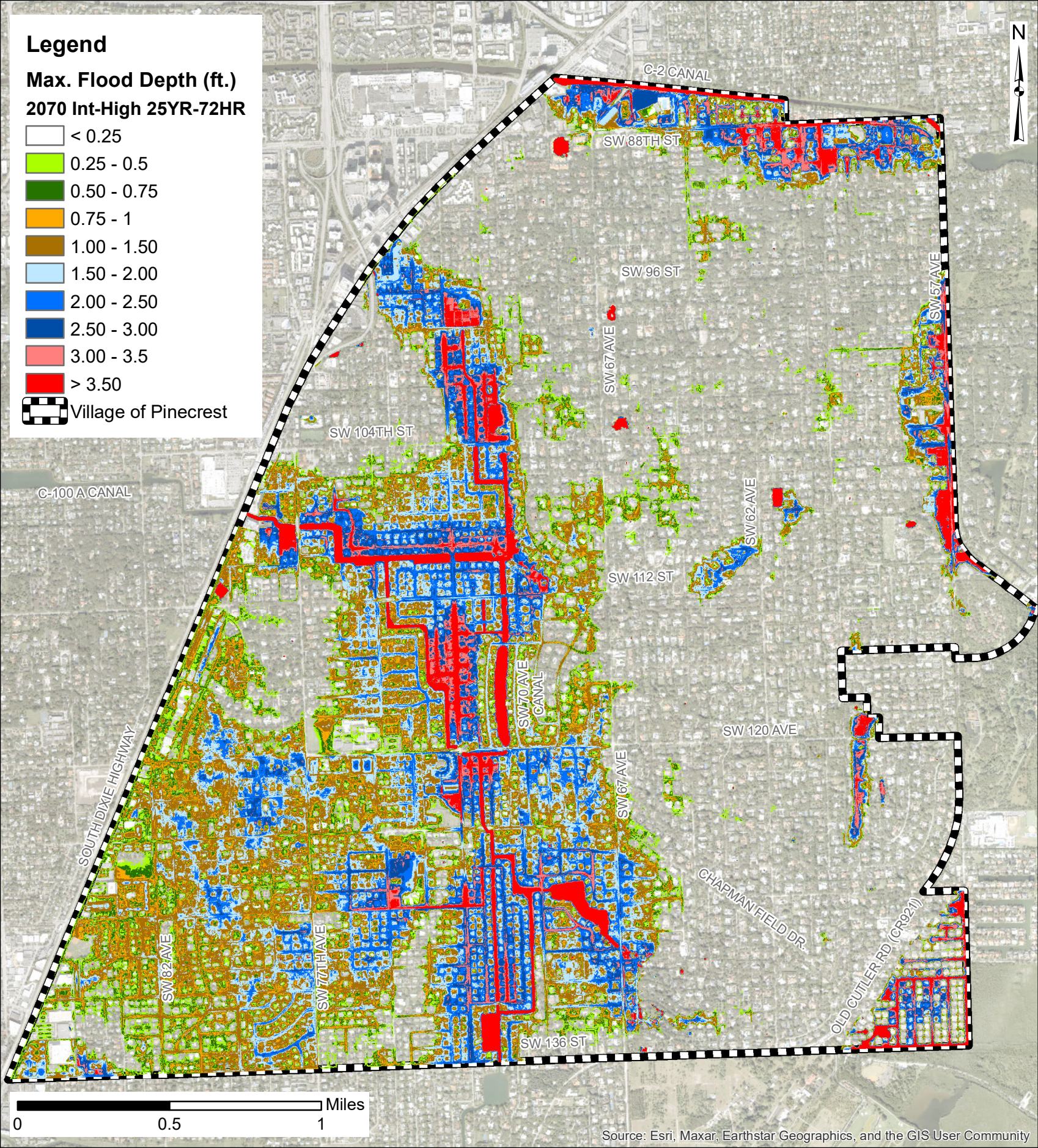

Legend
Max. Flood Depth (ft.)
2070 Int-Low 500YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 67 AVE
CHAPMAN FIELD DR.
SW 82 AVE
SW 77TH AVE
OLD CUTLER RD (CR 92A)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

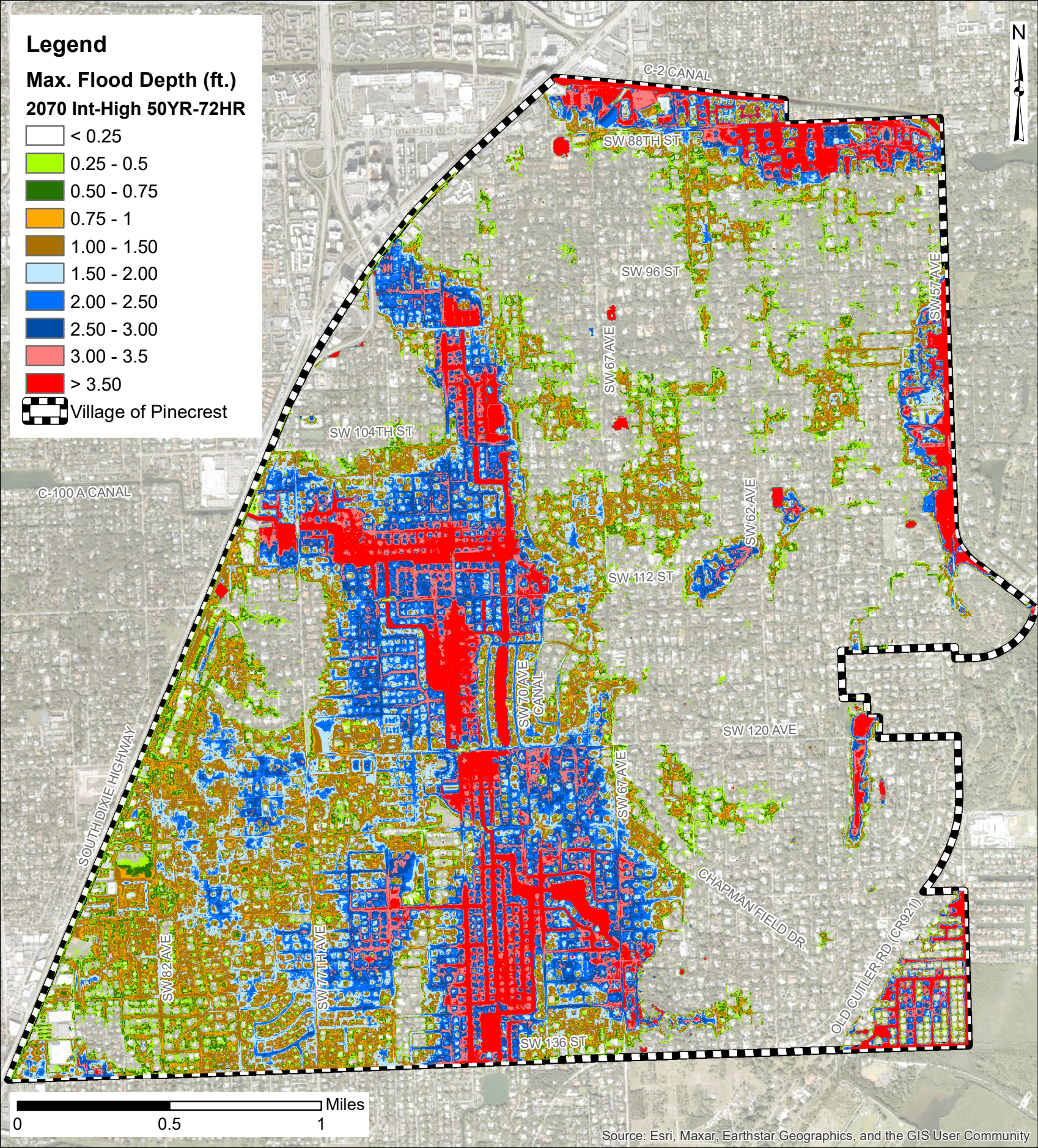
APPENDIX C-4

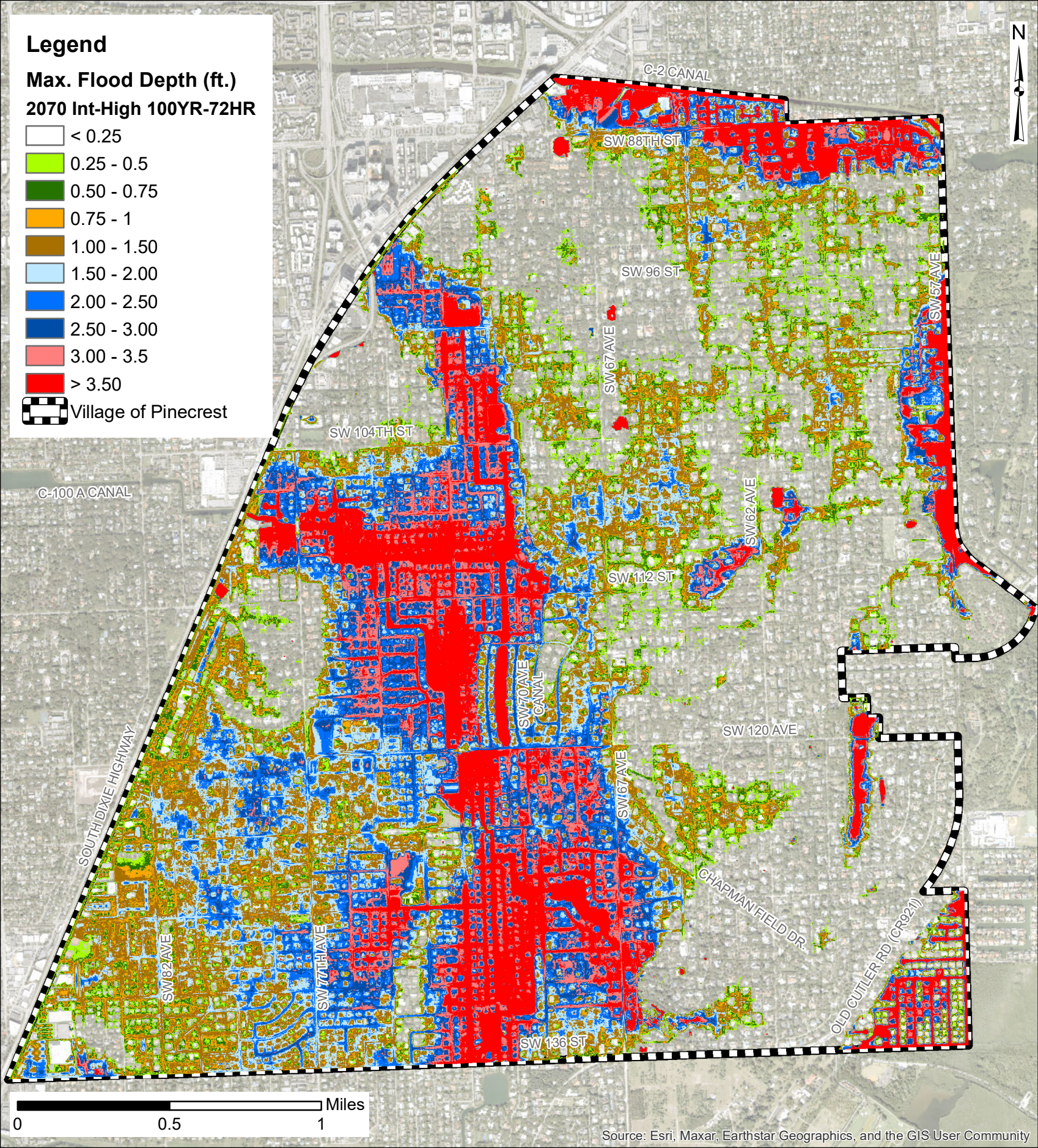
Scenario 4: 2070 Intermediate- High SLR

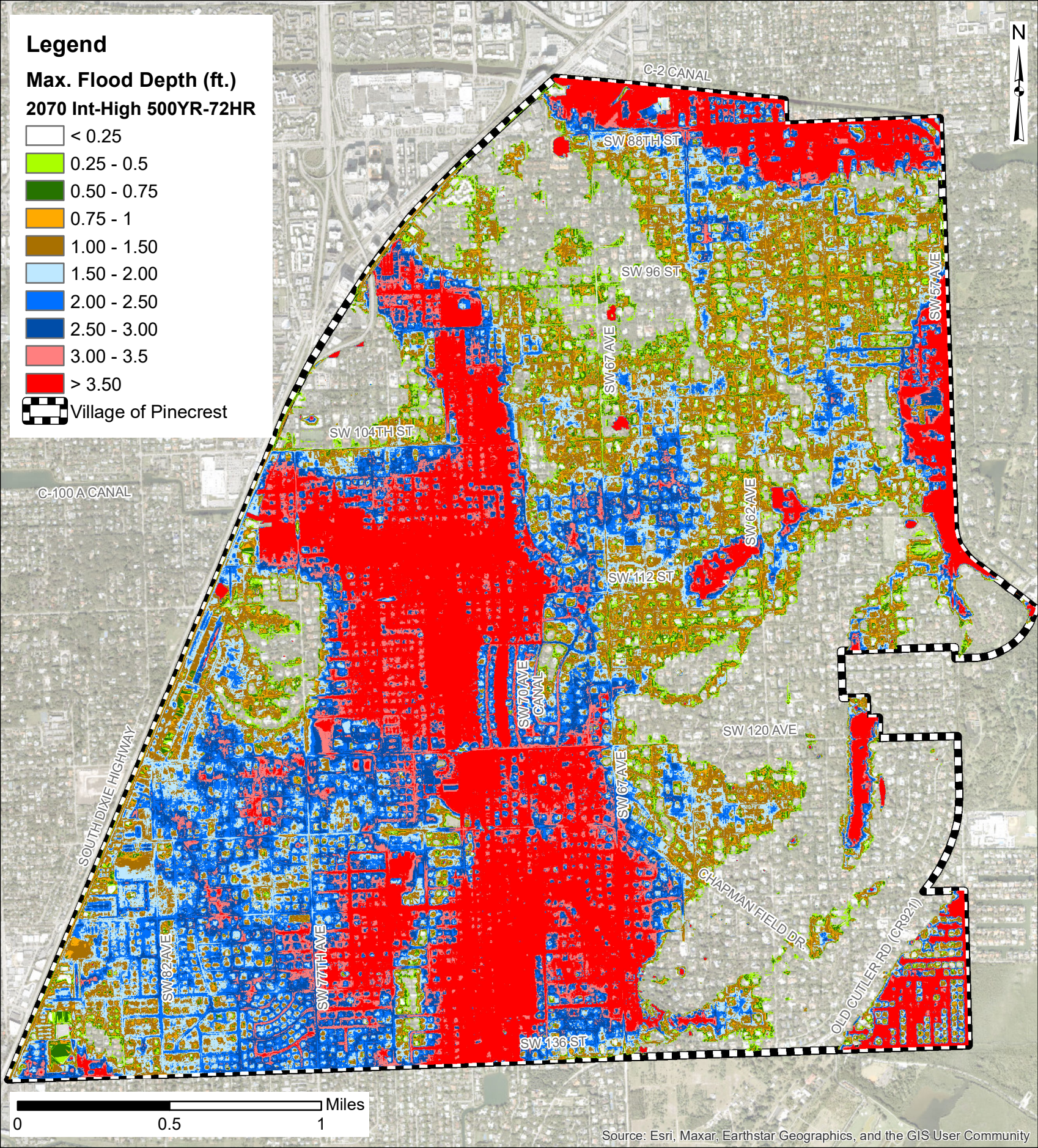

Legend
Max. Flood Depth (ft.)
2070 Int-High 5YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-High 10YR-24HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-High 25YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

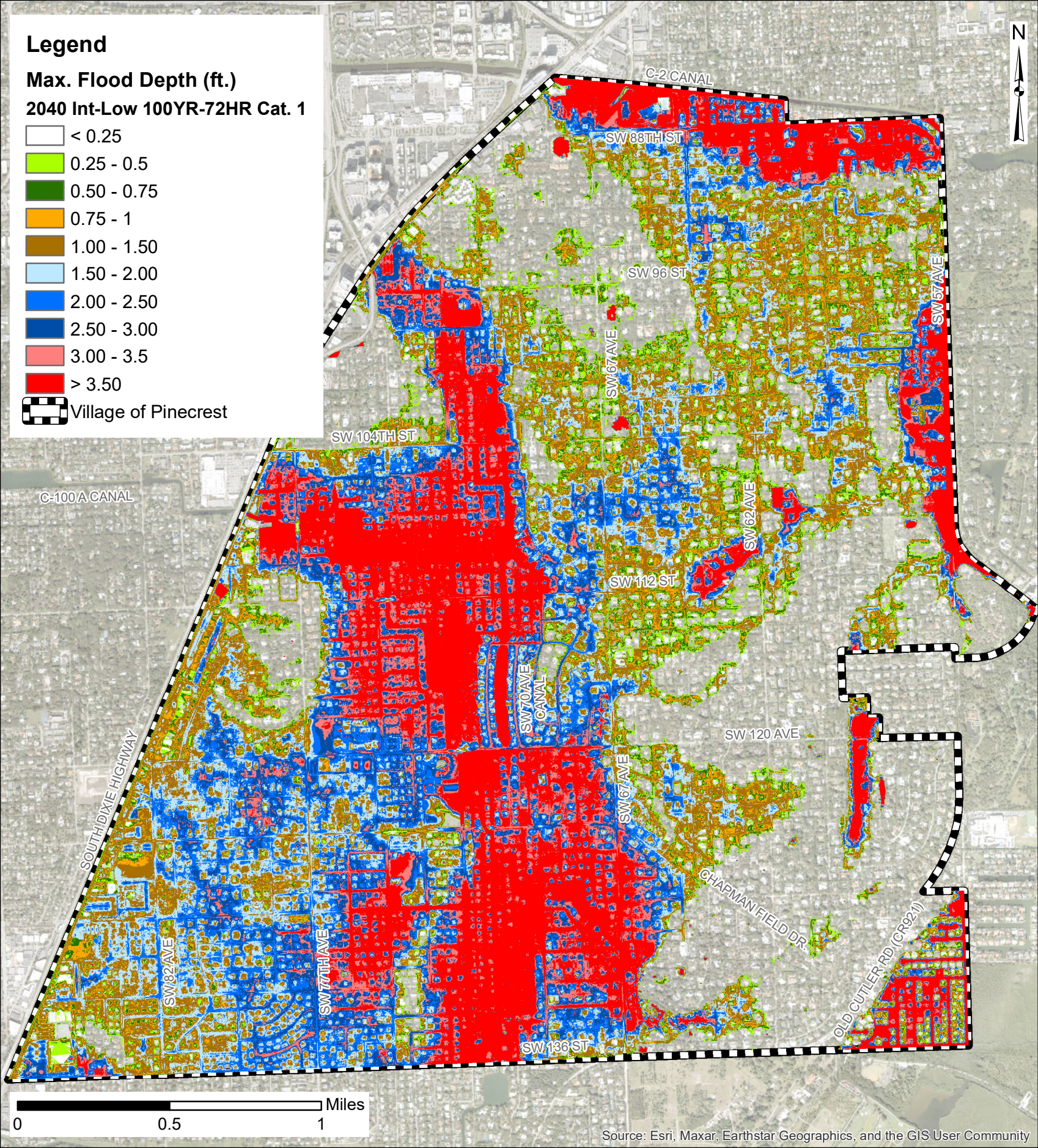

Legend
Max. Flood Depth (ft.)
2070 Int-High 50YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

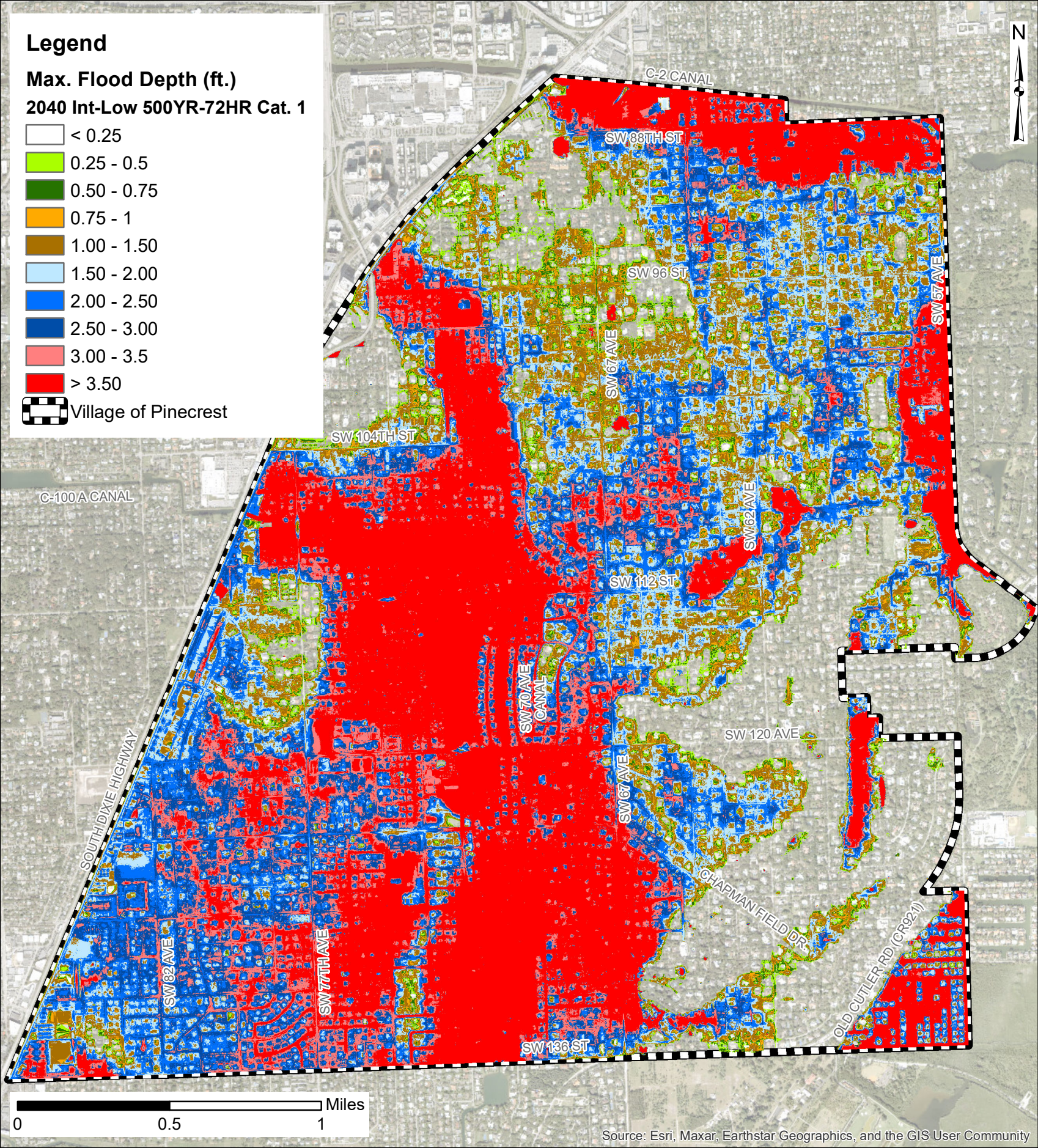

Legend
Max. Flood Depth (ft.)
2070 Int-High 100YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

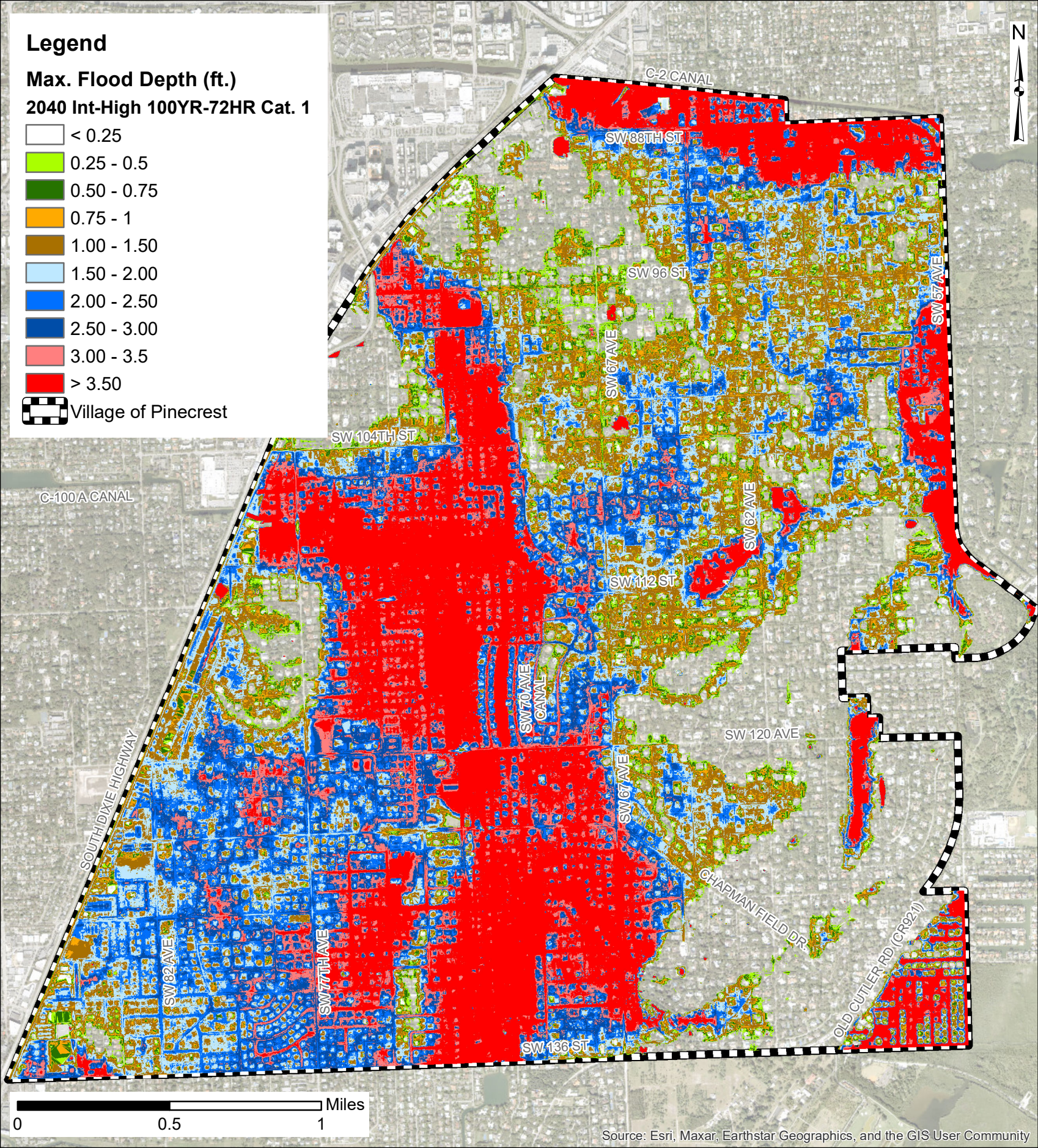

Legend
Max. Flood Depth (ft.)
2070 Int-High 500YR-72HR
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 67 AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

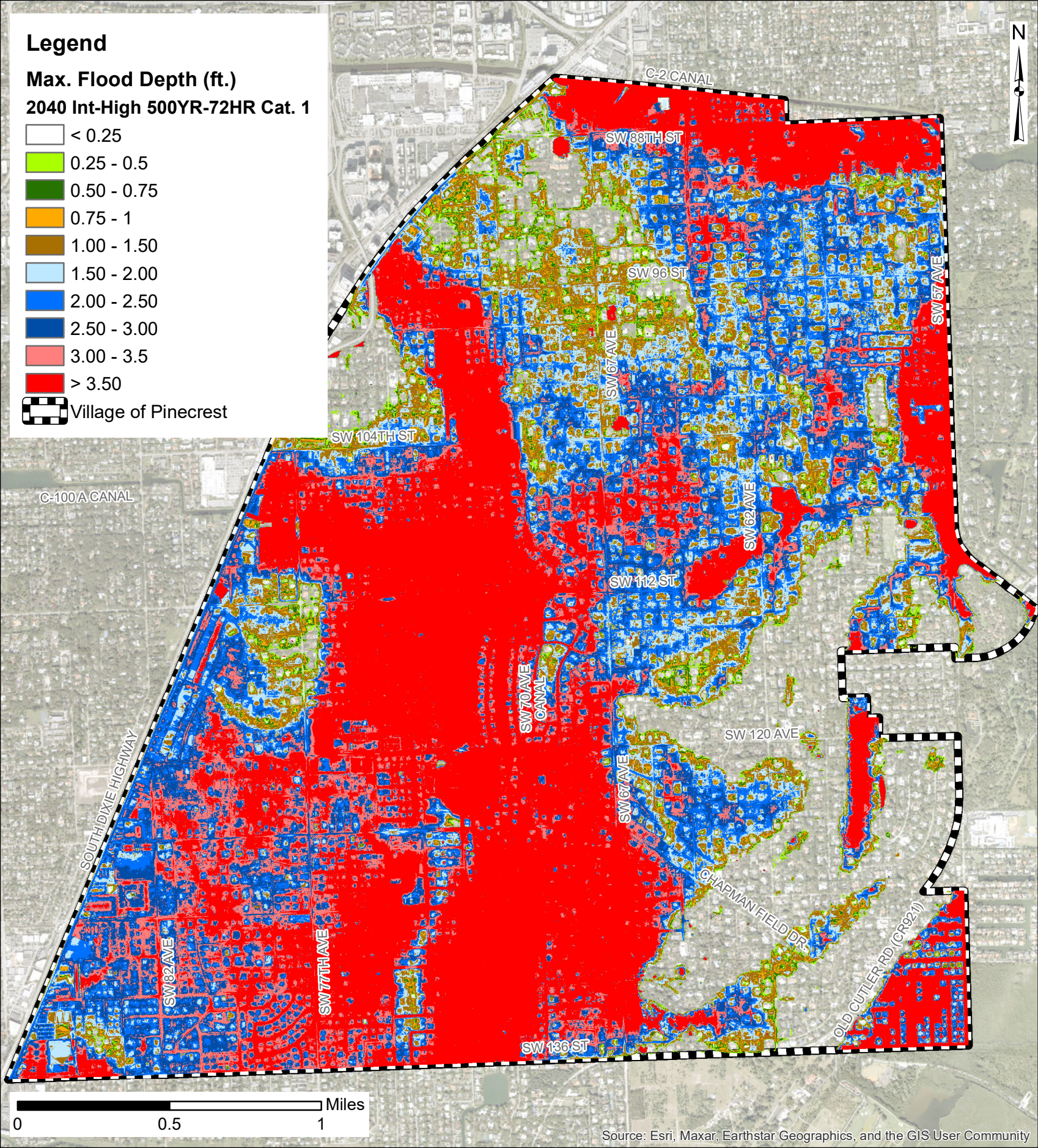
APPENDIX C-5

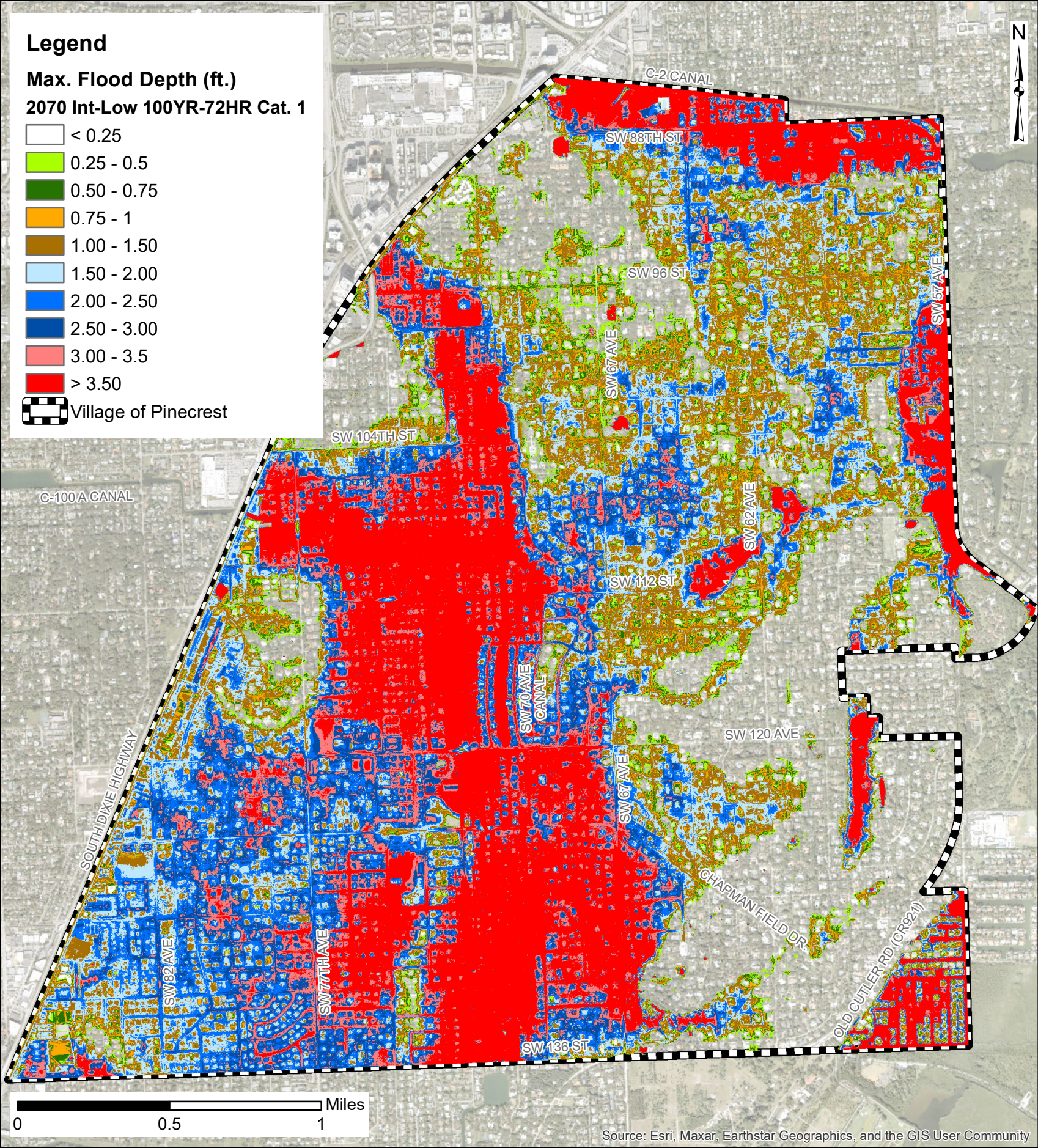
Scenario 5: Category 1 Storm Surge

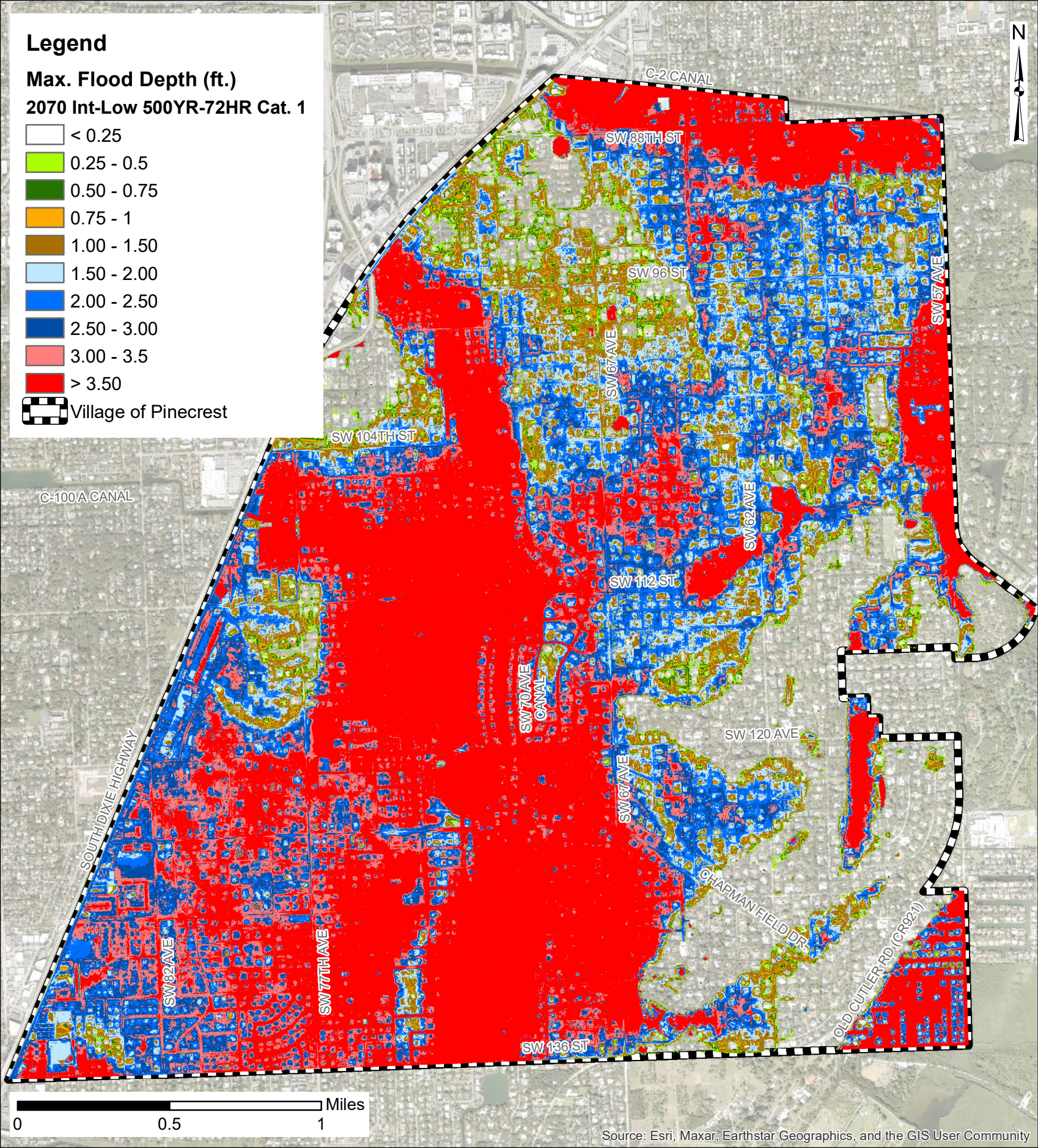

Legend
Max. Flood Depth (ft.)
2040 Int-Low 100YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE
CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 136 ST
CHAPMAN FIELD DR
OLD CUTLER Rd (CR 921)
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

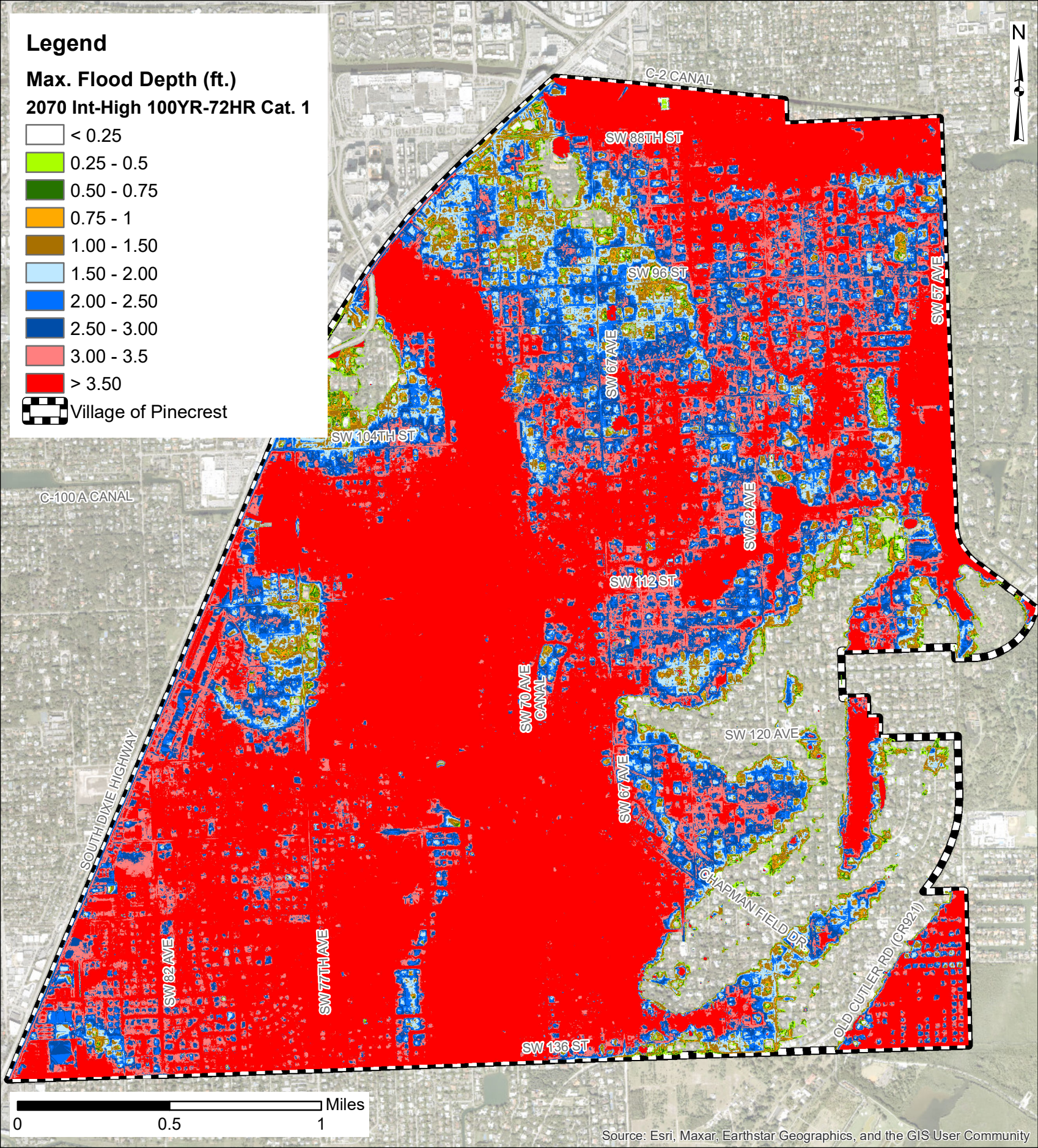

Legend
Max. Flood Depth (ft.)
2040 Int-Low 500YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

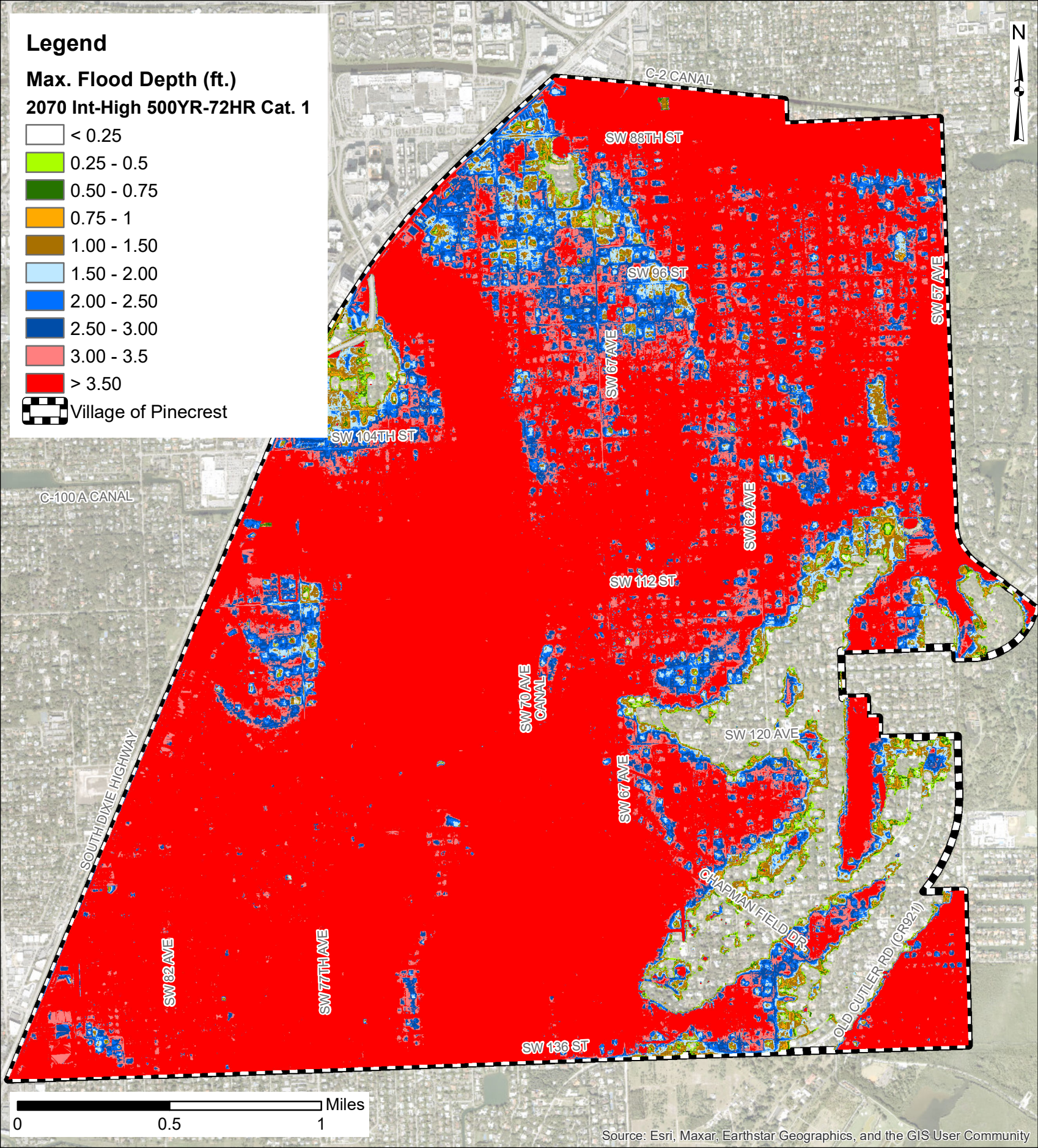

Legend
Max. Flood Depth (ft.)
2040 Int-High 100YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER Rd (CR921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2040 Int-High 500YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-Low 100YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
SW 136 ST
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

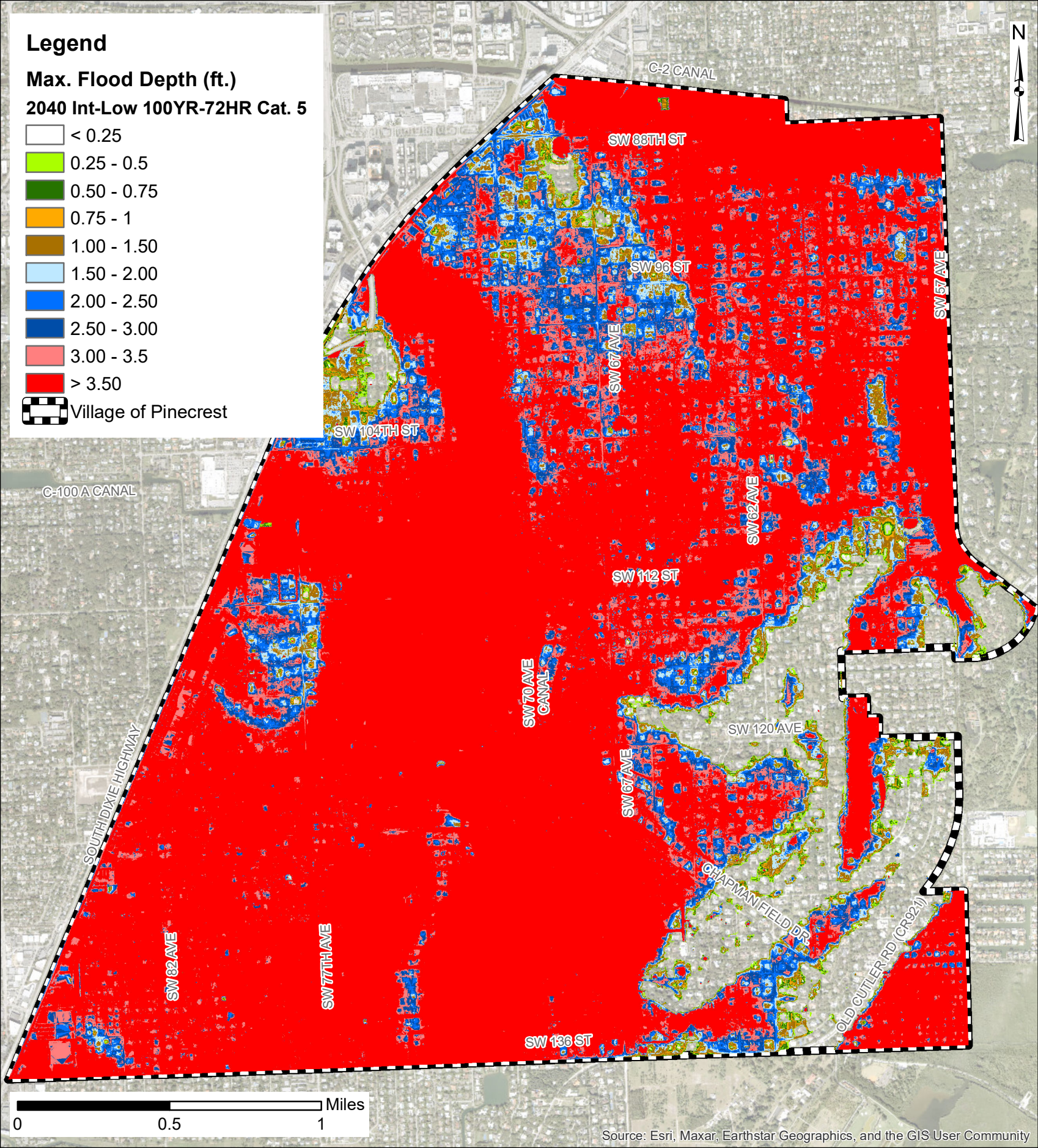

Legend
Max. Flood Depth (ft.)
2070 Int-Low 500YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER Rd (CR 921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

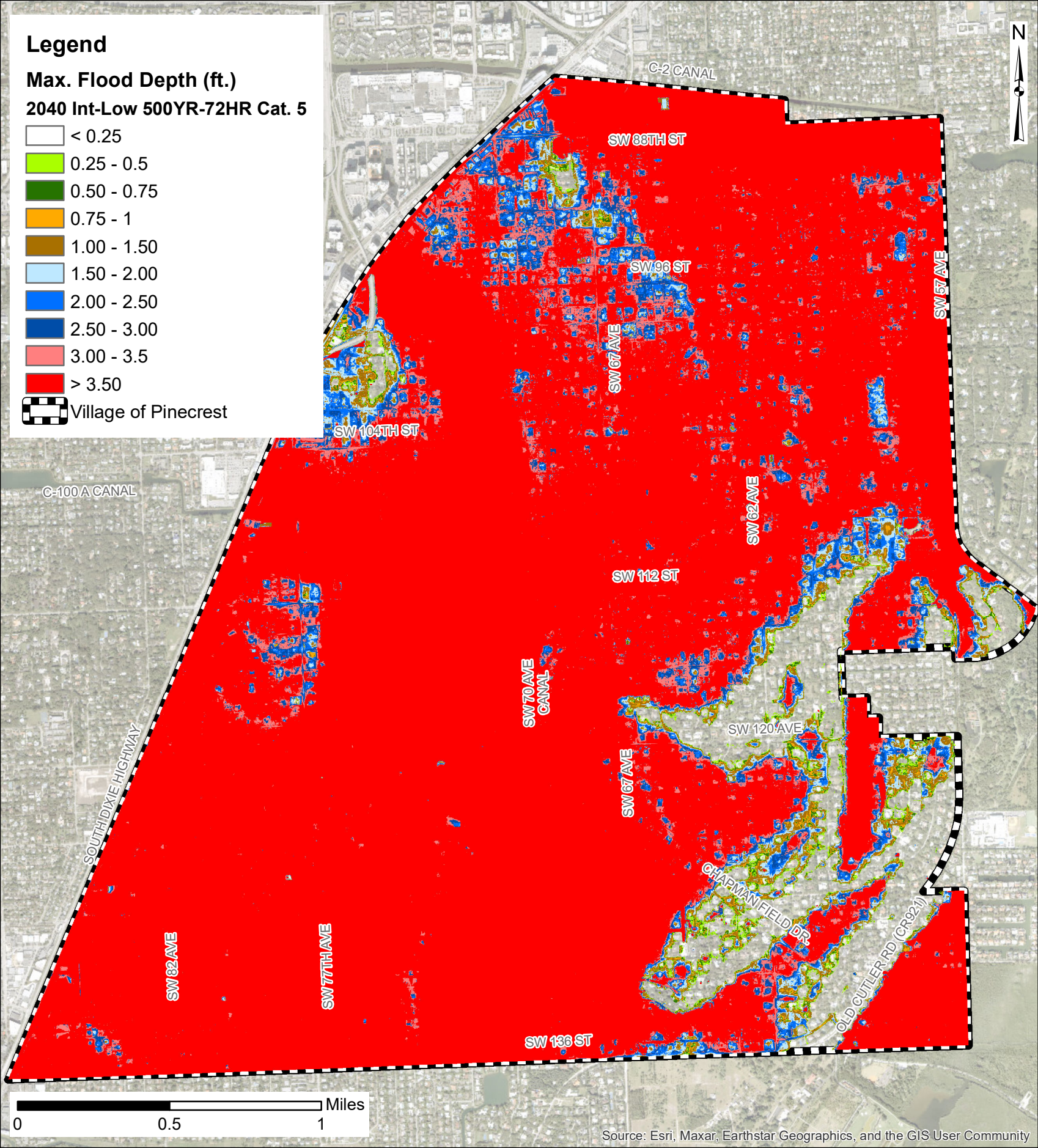

Legend
Max. Flood Depth (ft.)
2070 Int-High 100YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR921)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

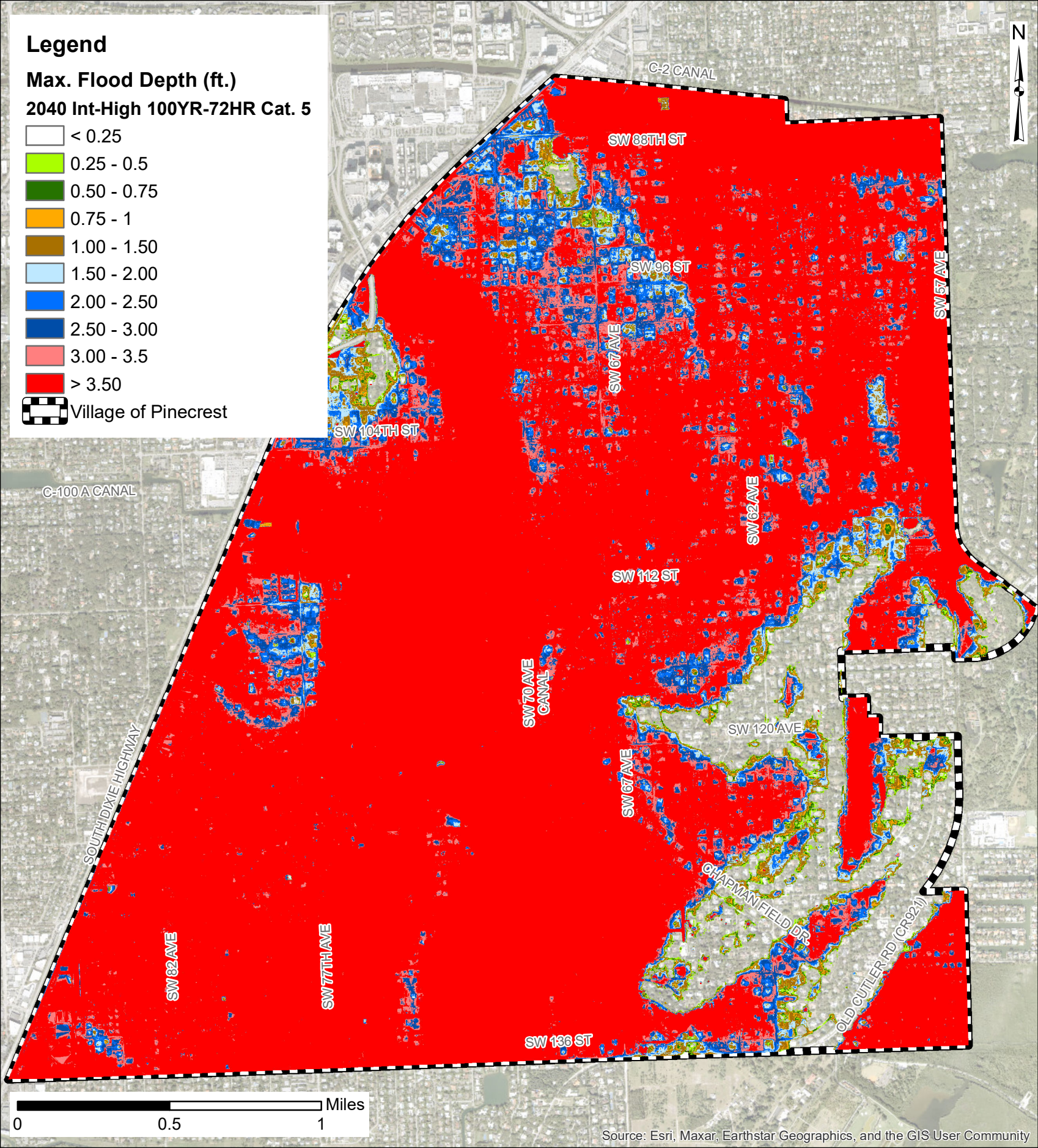

Legend
Max. Flood Depth (ft.)
2070 Int-High 500YR-72HR Cat. 1
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 921)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

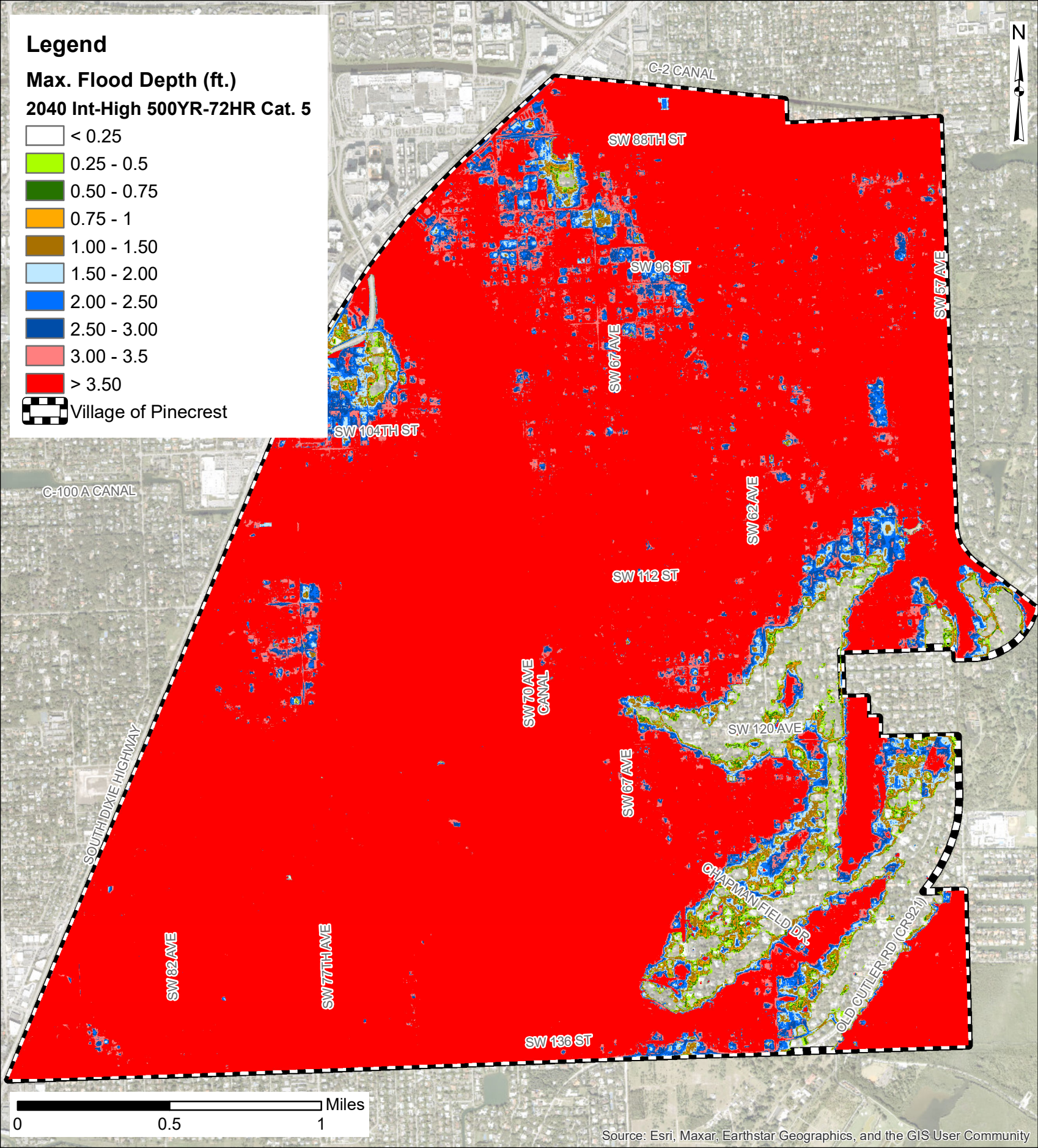
APPENDIX C-6

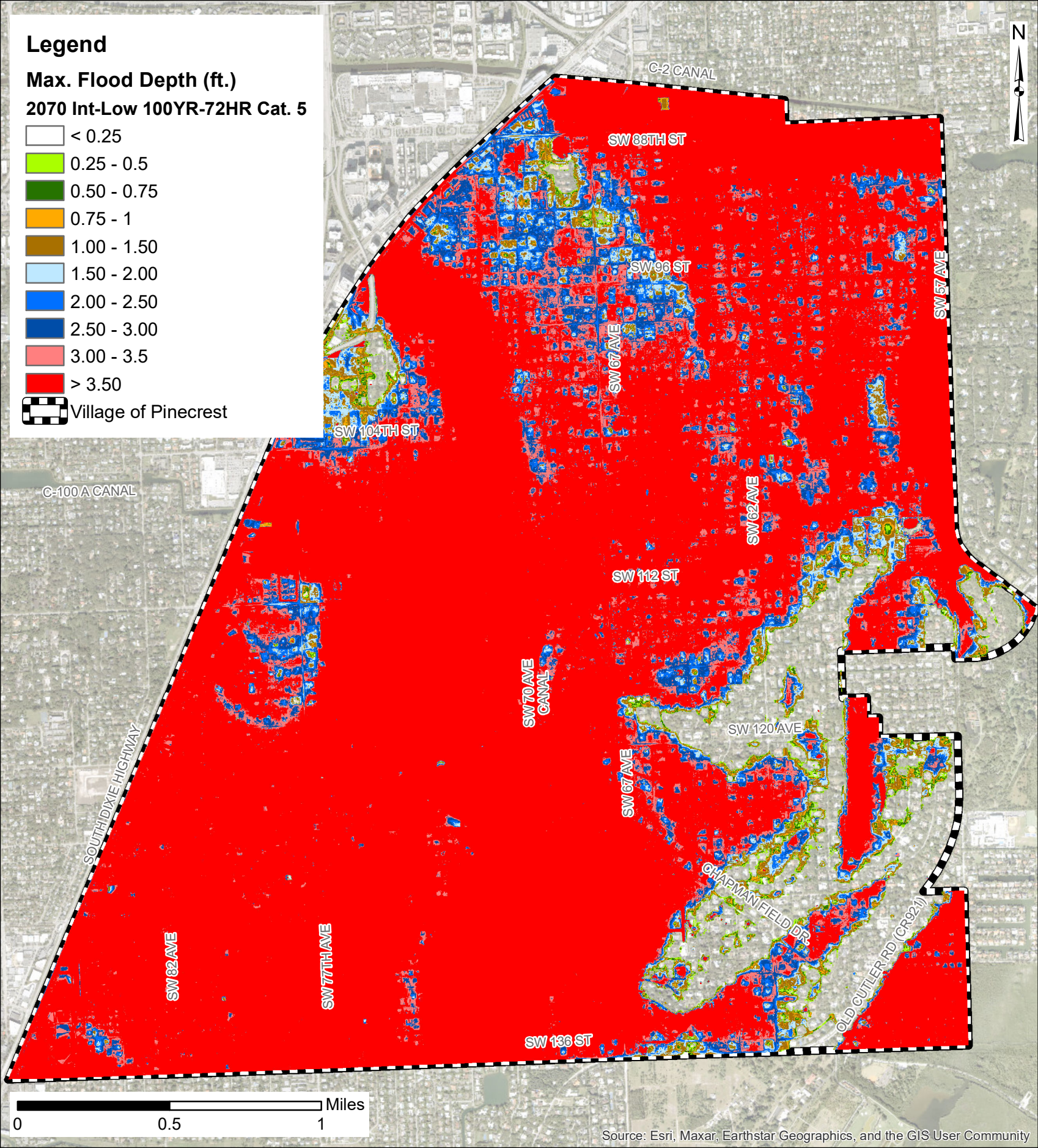
Scenario 6: Category 5 Storm Surge

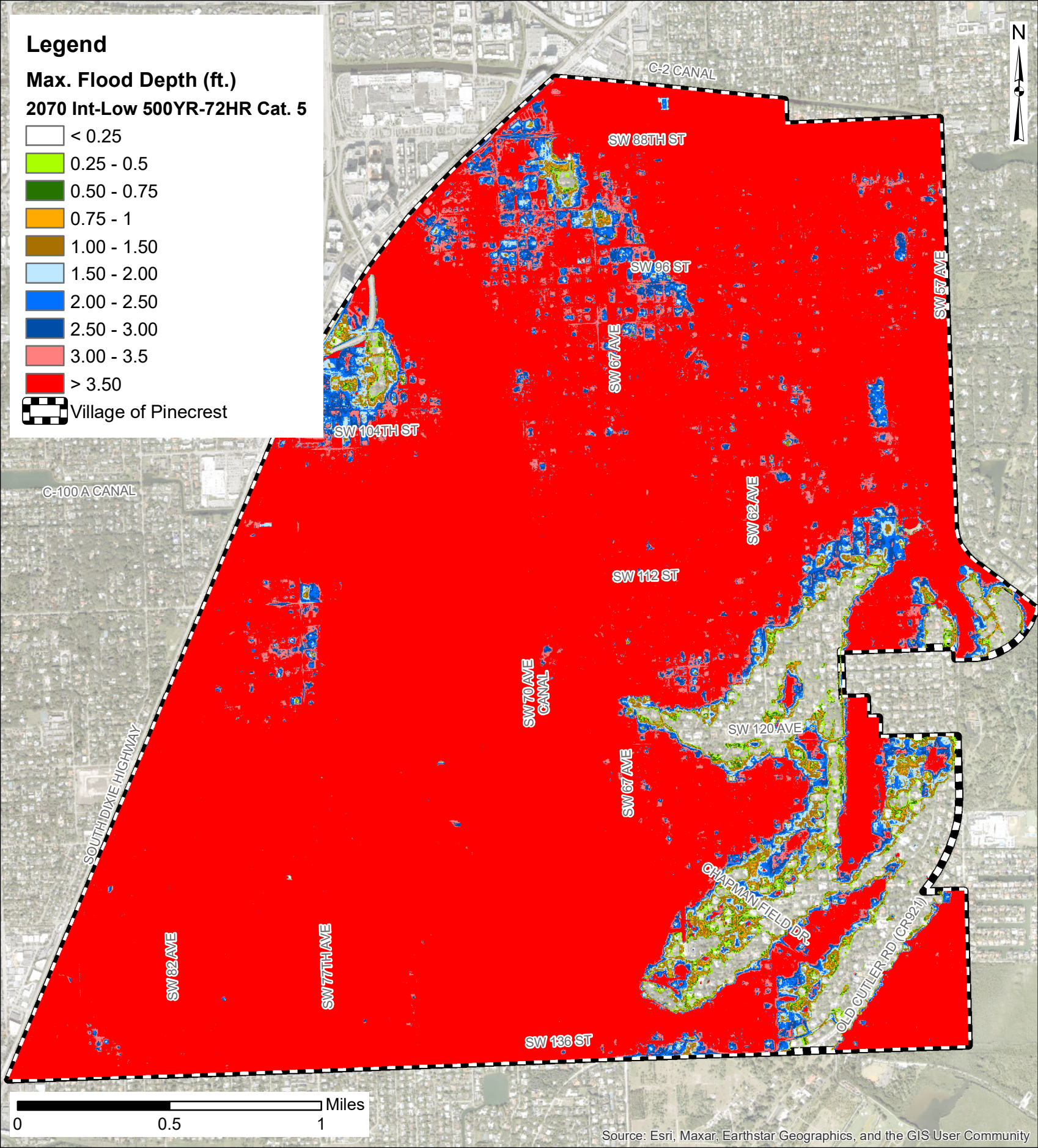

Legend
Max. Flood Depth (ft.)
2040 Int-Low 100YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

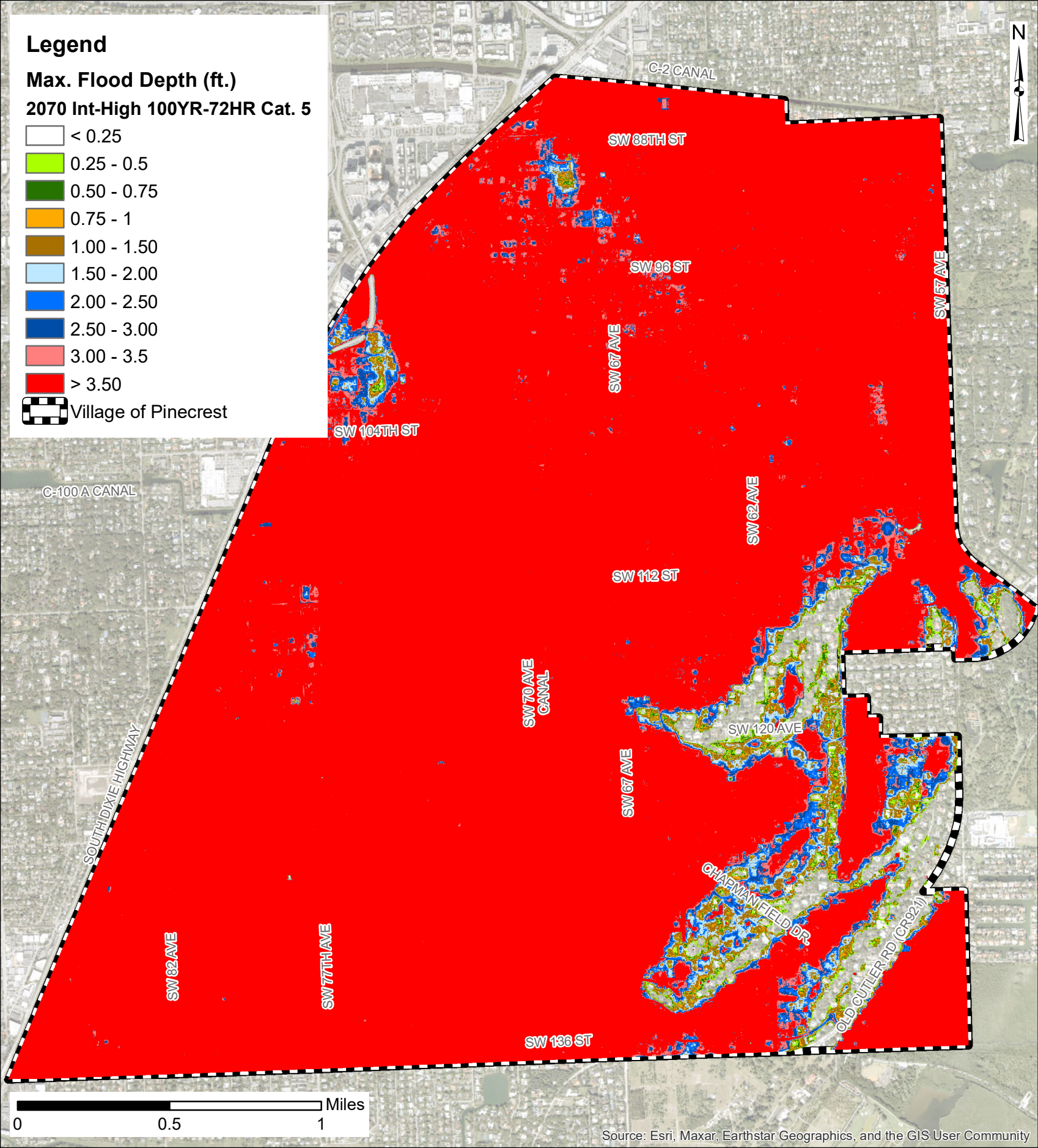

Legend
Max. Flood Depth (ft.)
2040 Int-Low 500YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 67 AVE
SW 57 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

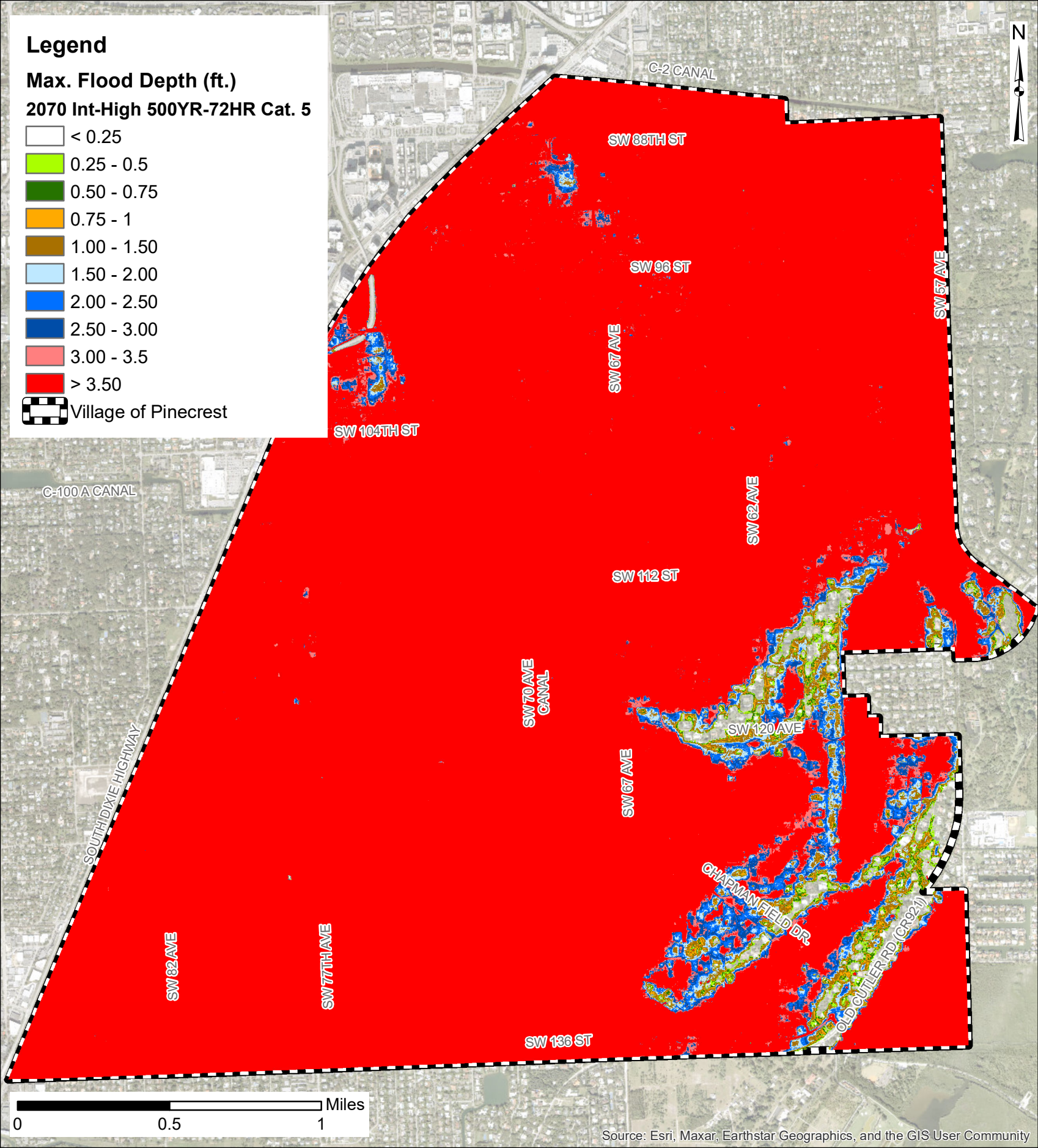

Legend
Max. Flood Depth (ft.)
2040 Int-High 100YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
SW 82 AVE
SW 77TH AVE
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2040 Int-High 500YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-Low 100YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-Low 500YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 9211)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Legend
Max. Flood Depth (ft.)
2070 Int-High 100YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 924)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

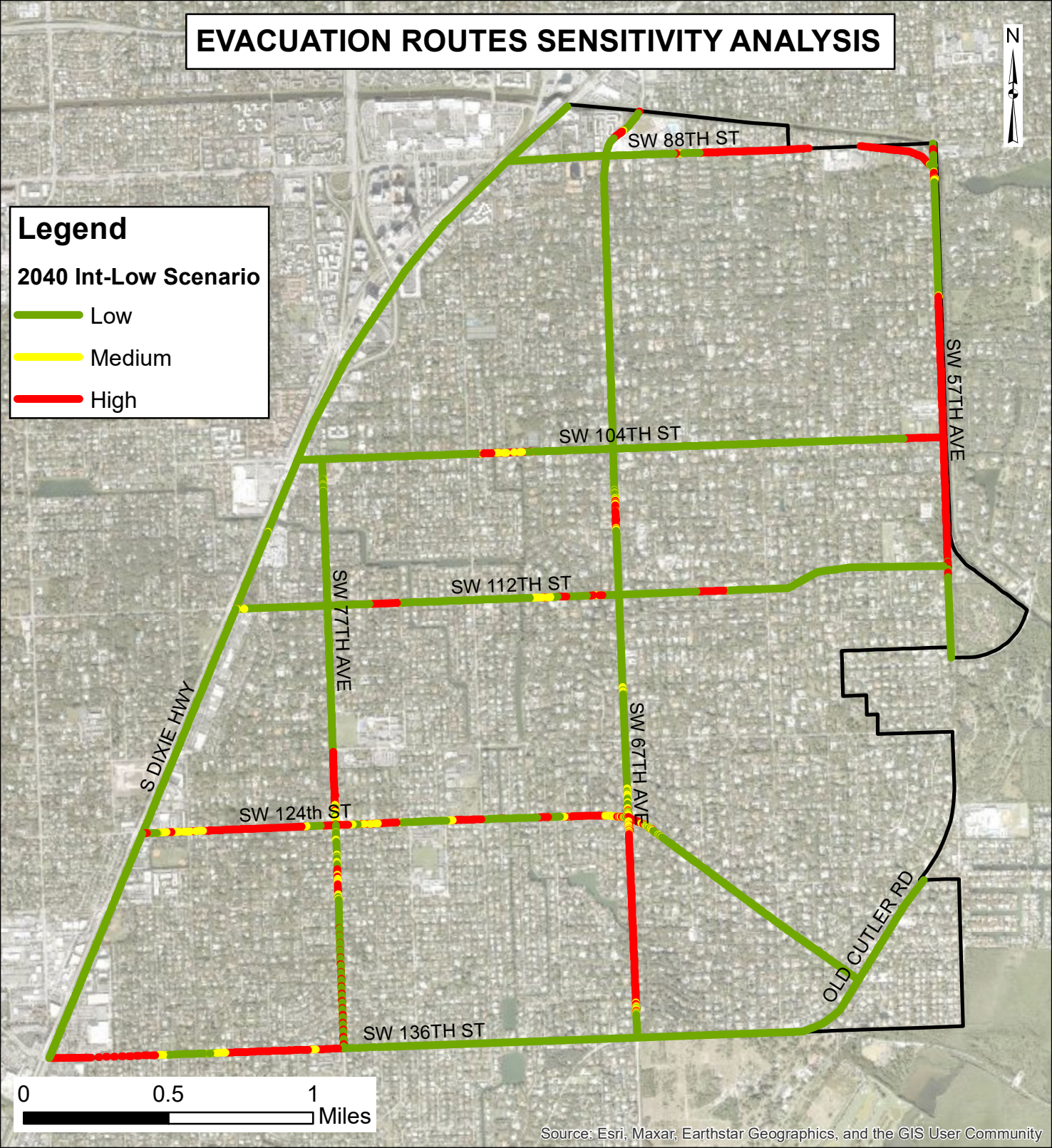

Legend
Max. Flood Depth (ft.)
2070 Int-High 500YR-72HR Cat. 5
< 0.25
0.25 - 0.5
0.50 - 0.75
0.75 - 1
1.00 - 1.50
1.50 - 2.00
2.00 - 2.50
2.50 - 3.00
3.00 - 3.5
> 3.50
Village of Pinecrest
N
C-2 CANAL
SW 88TH ST
SW 96 ST
SW 57 AVE
SW 67 AVE
SW 104TH ST
C-100 A CANAL
SW 62 AVE
SW 112 ST
SW 70 AVE CANAL
SW 120 AVE
SW 67 AVE
SOUTH DIXIE HIGHWAY
CHAPMAN FIELD DR
OLD CUTLER RD (CR 924)
SW 82 AVE
SW 77TH AVE
SW 136 ST
Miles
0
0.5
1
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

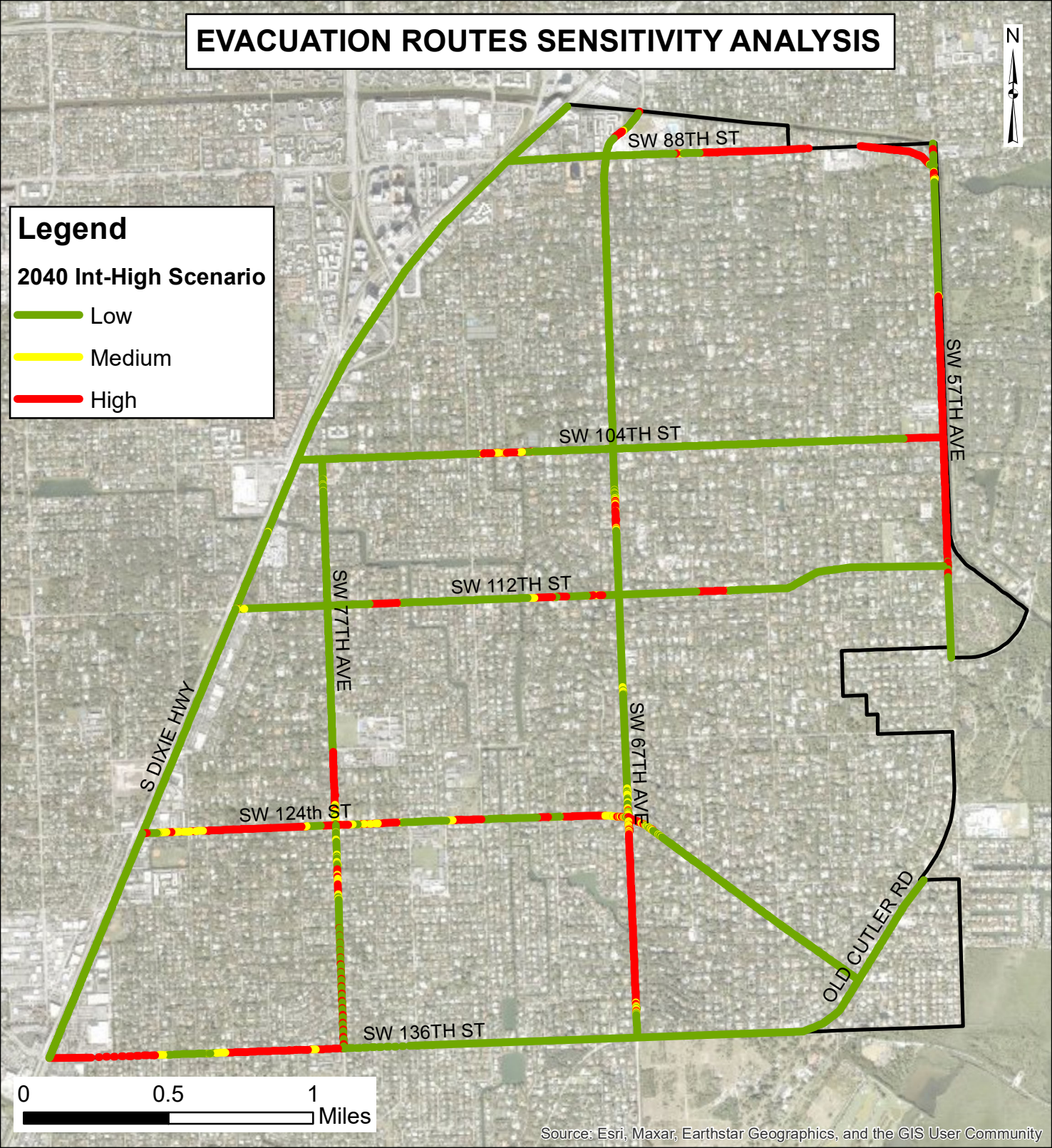
APPENDIX D-1

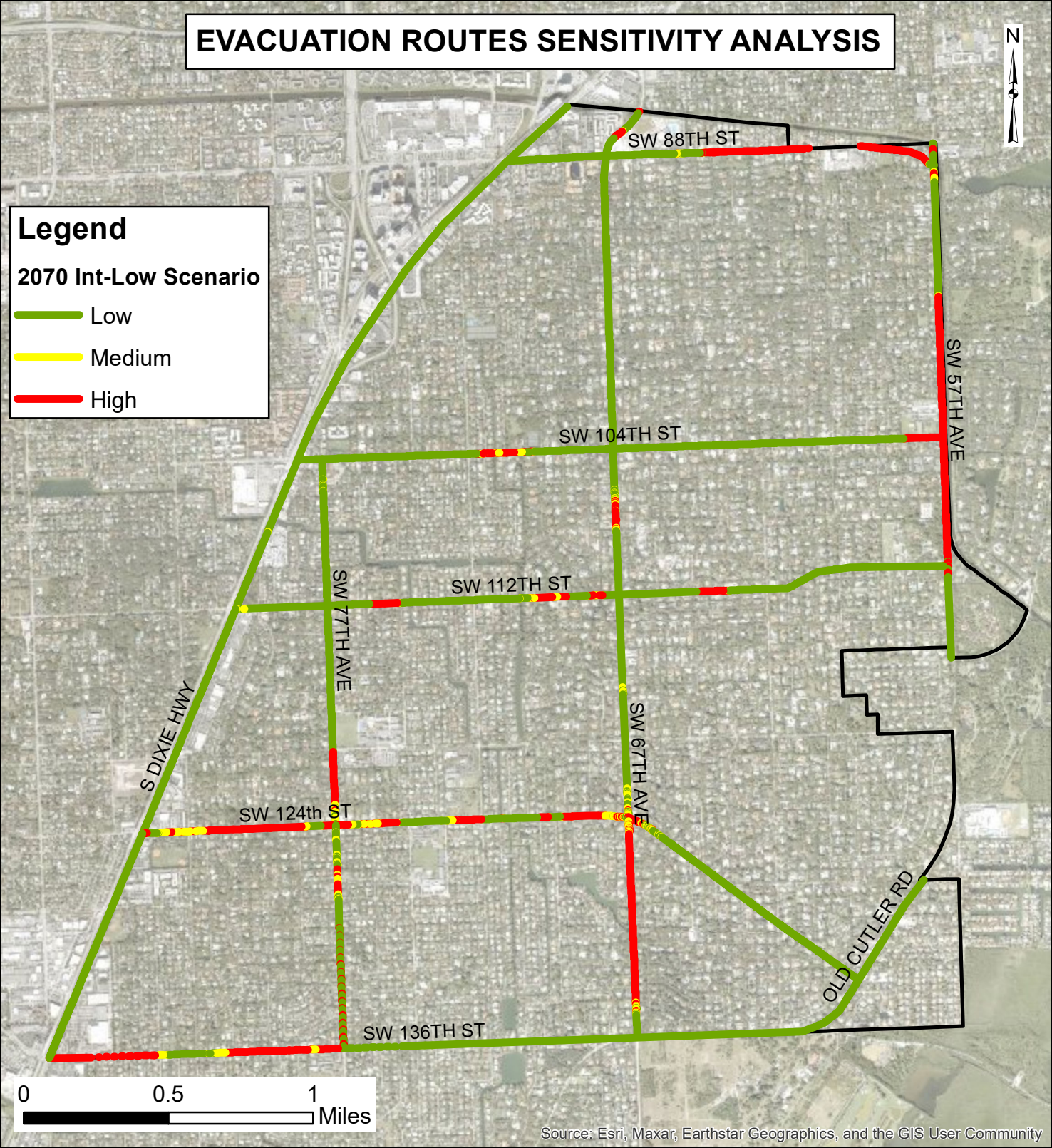
Evacuation Routes Sensitivity Analysis Maps

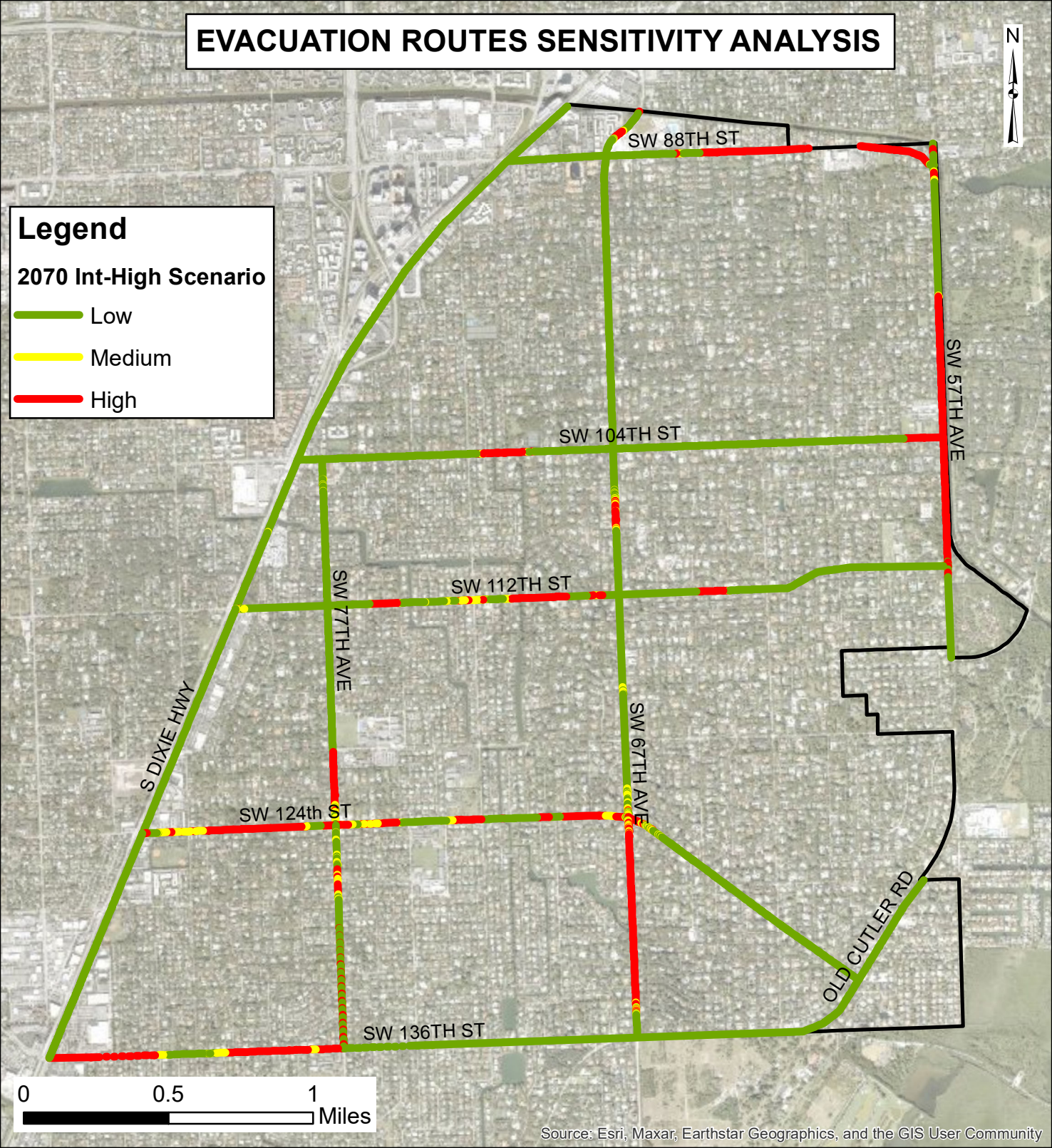
SEA-LEVEL RISE SCENARIOS

EVACUATION ROUTES SENSITIVITY ANALYSIS

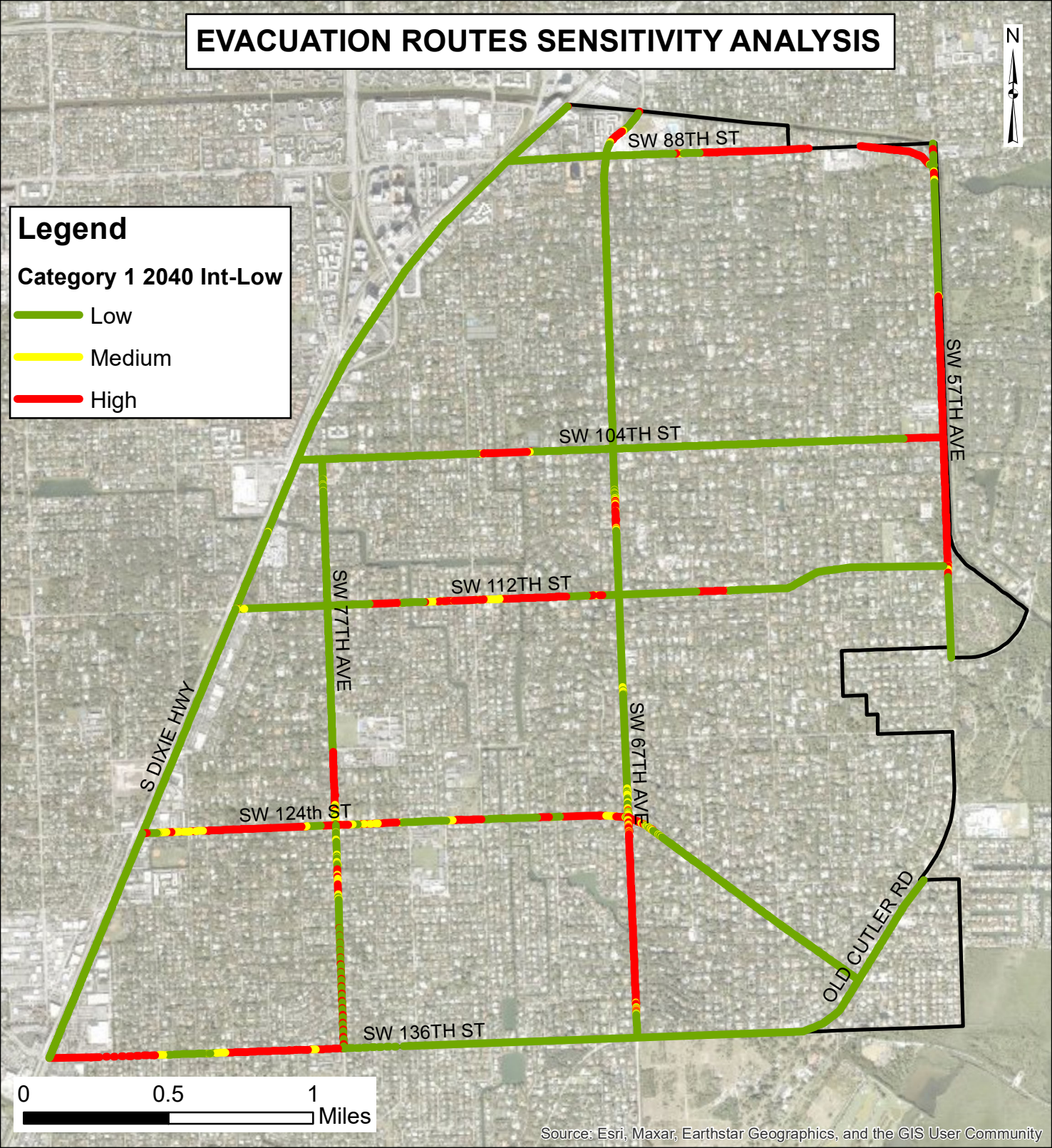


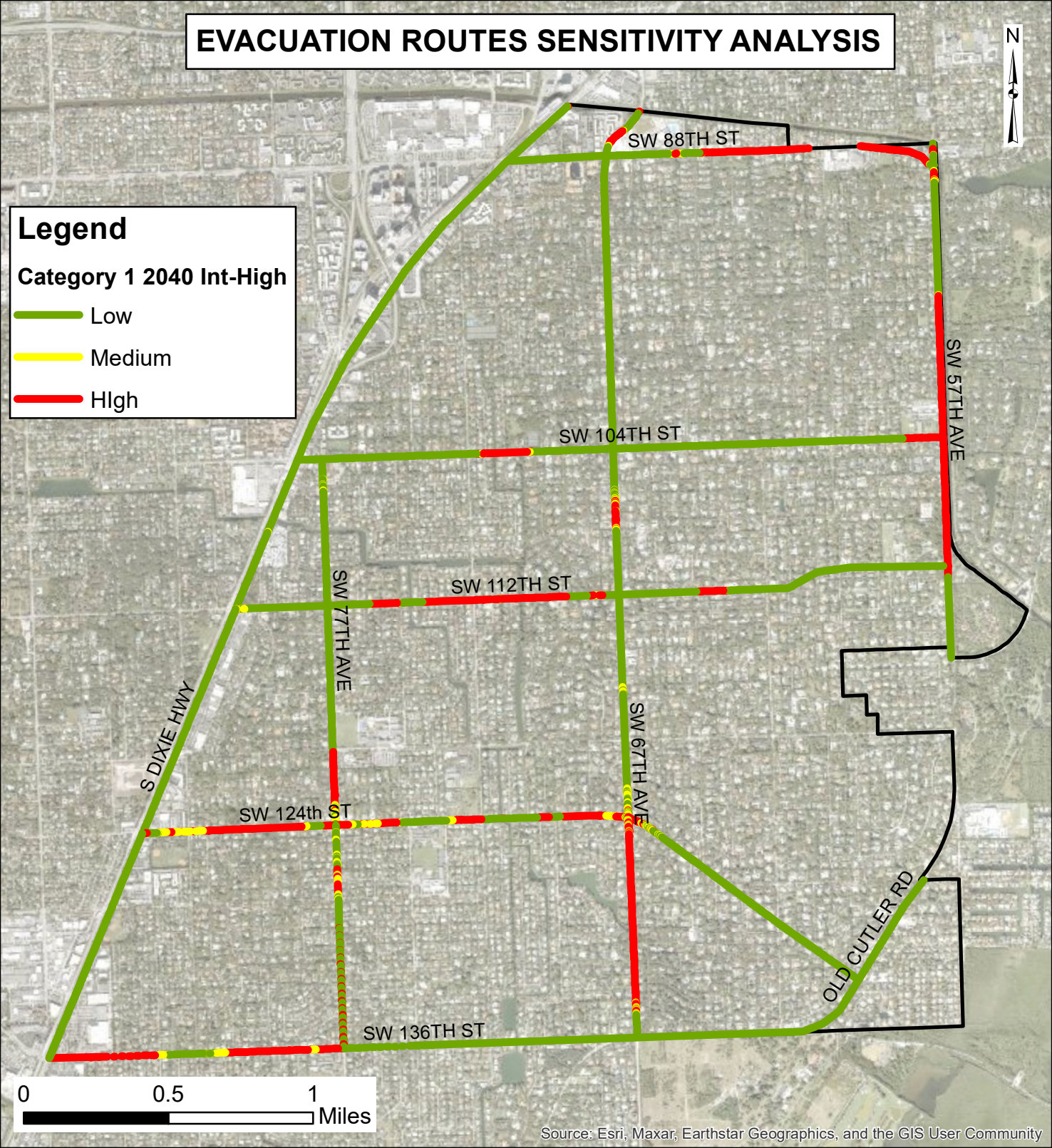

EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
2040 Int-High Scenario
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

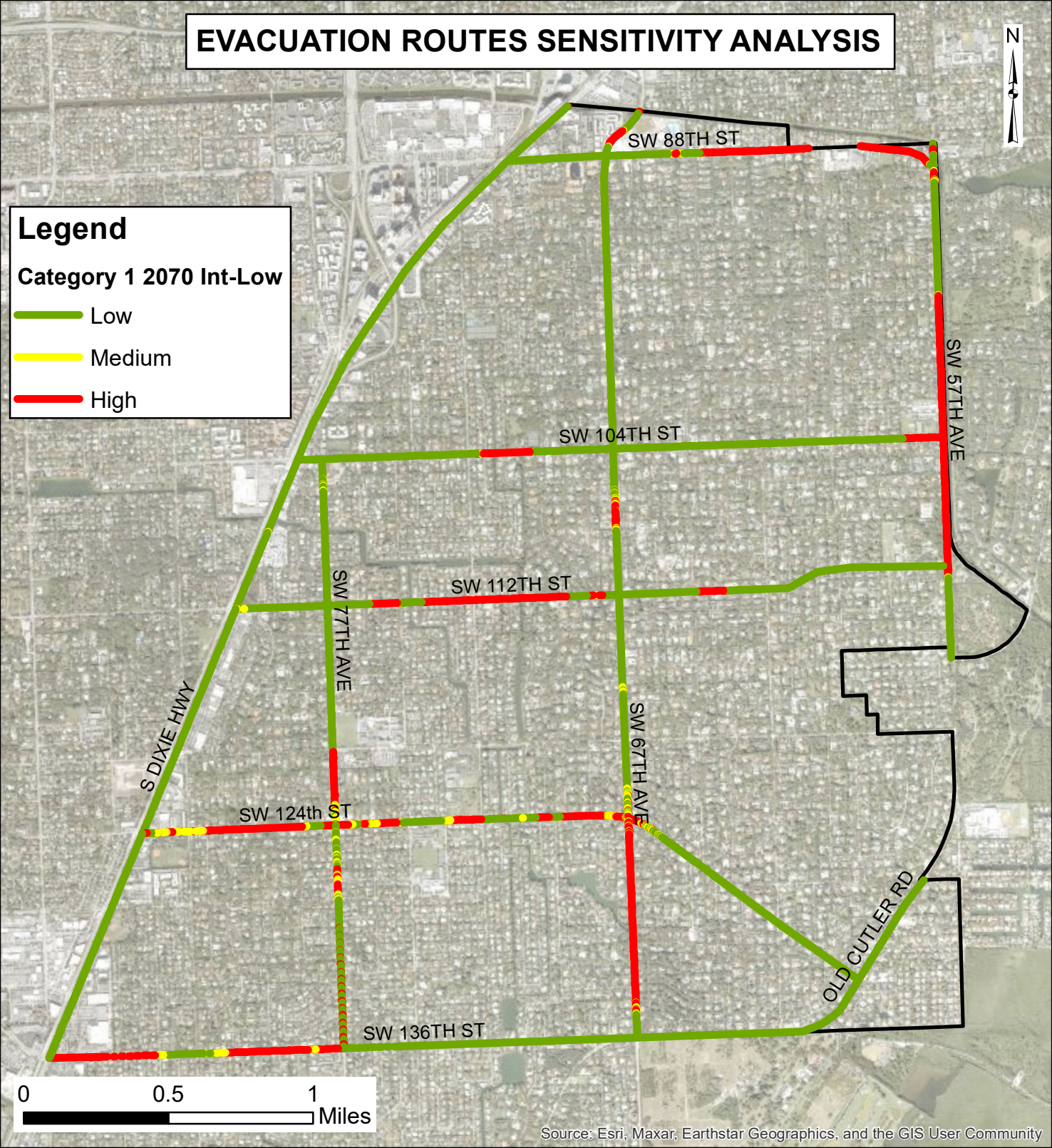

EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
2070 Int-Low Scenario
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
2070 Int-High Scenario
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

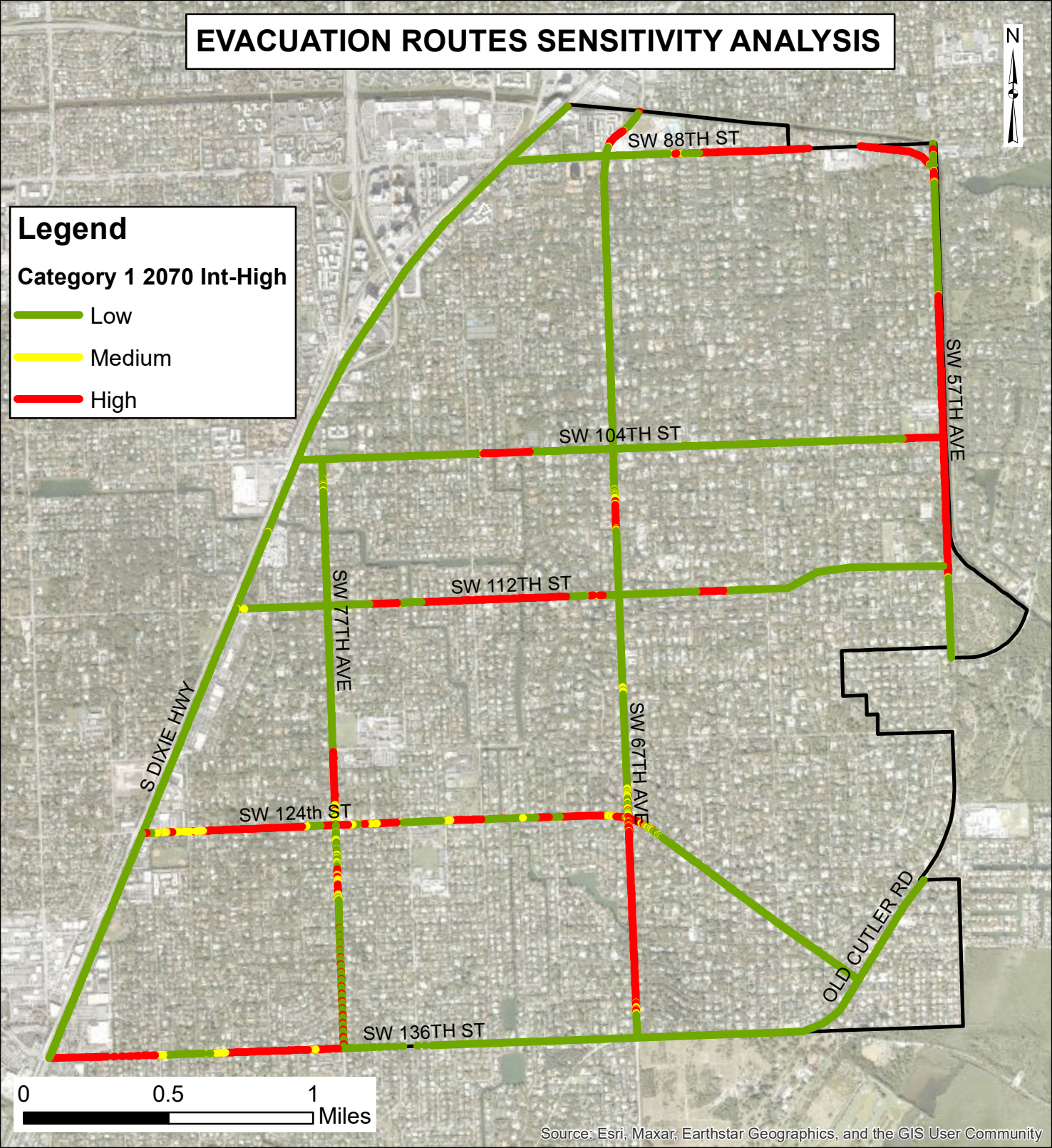
CATEGORY 1 STORM SURGE SCENARIOS


EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
Category 1 2040 Int-Low
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
Category 1 2040 Int-High
Low
Medium
HIgh
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

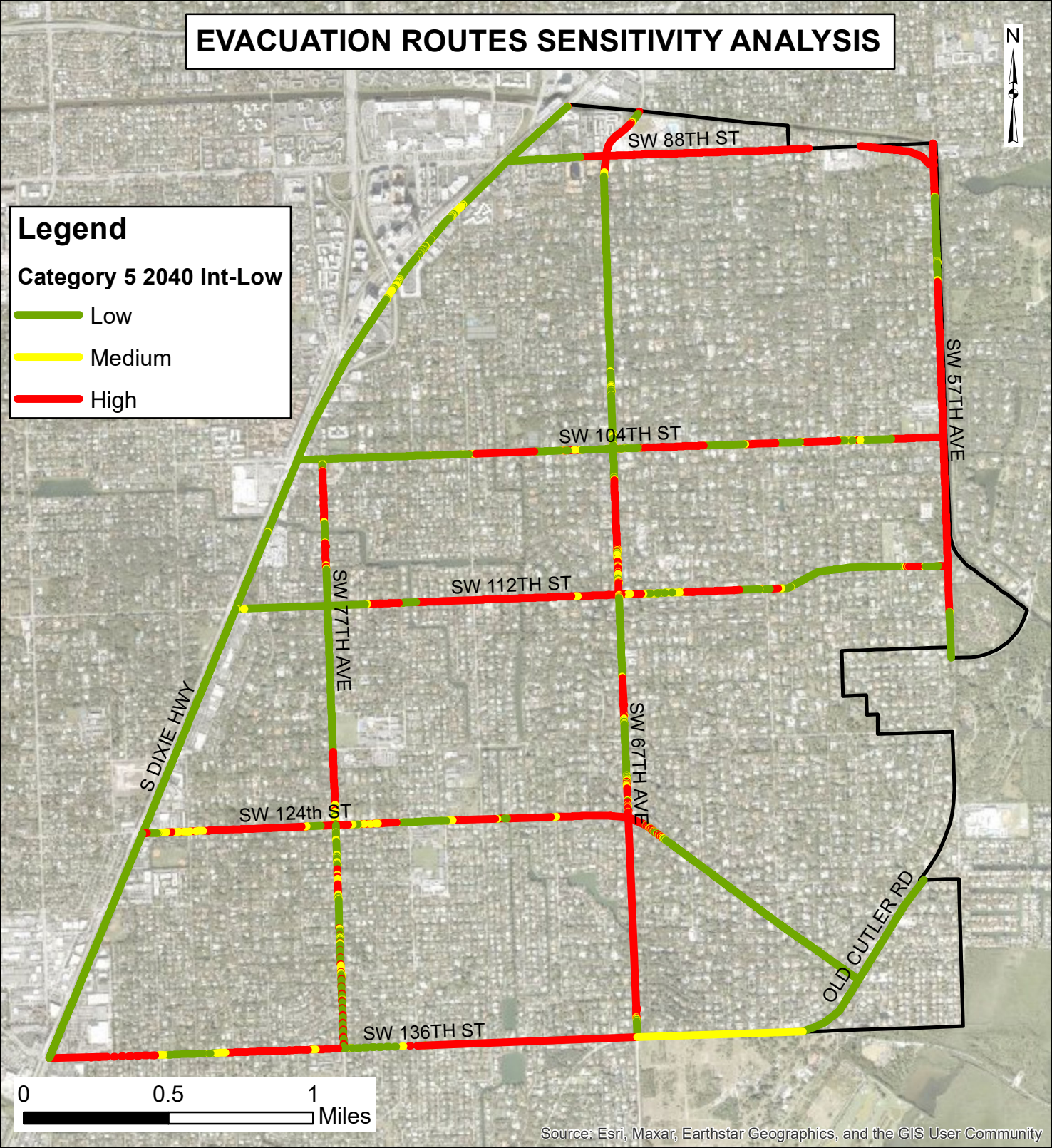

EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
Category 1 2070 Int-Low
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

EVACUATION ROUTES SENSITIVITY ANALYSIS

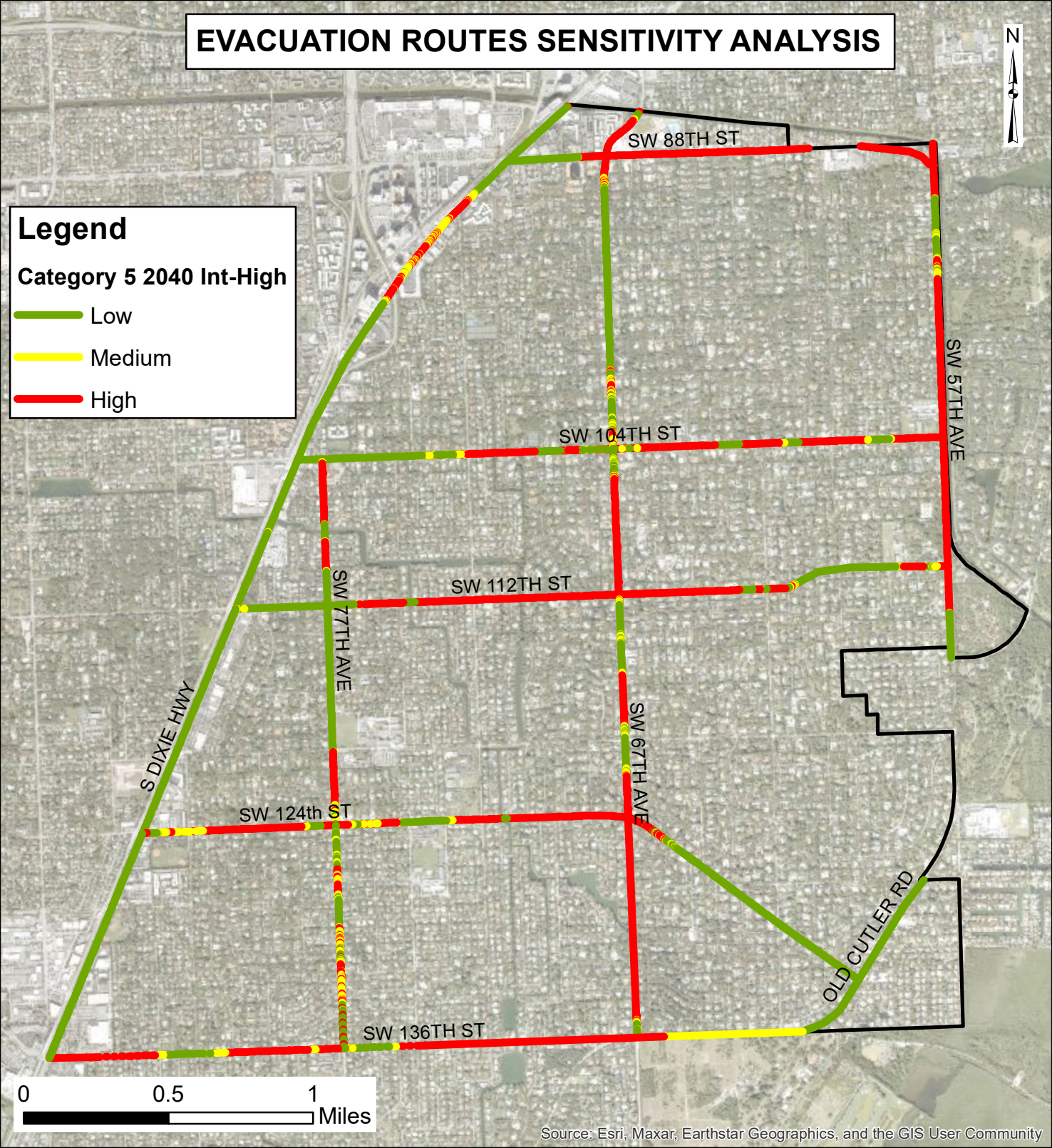


CATEGORY 5 STORM SURGE SCENARIOS

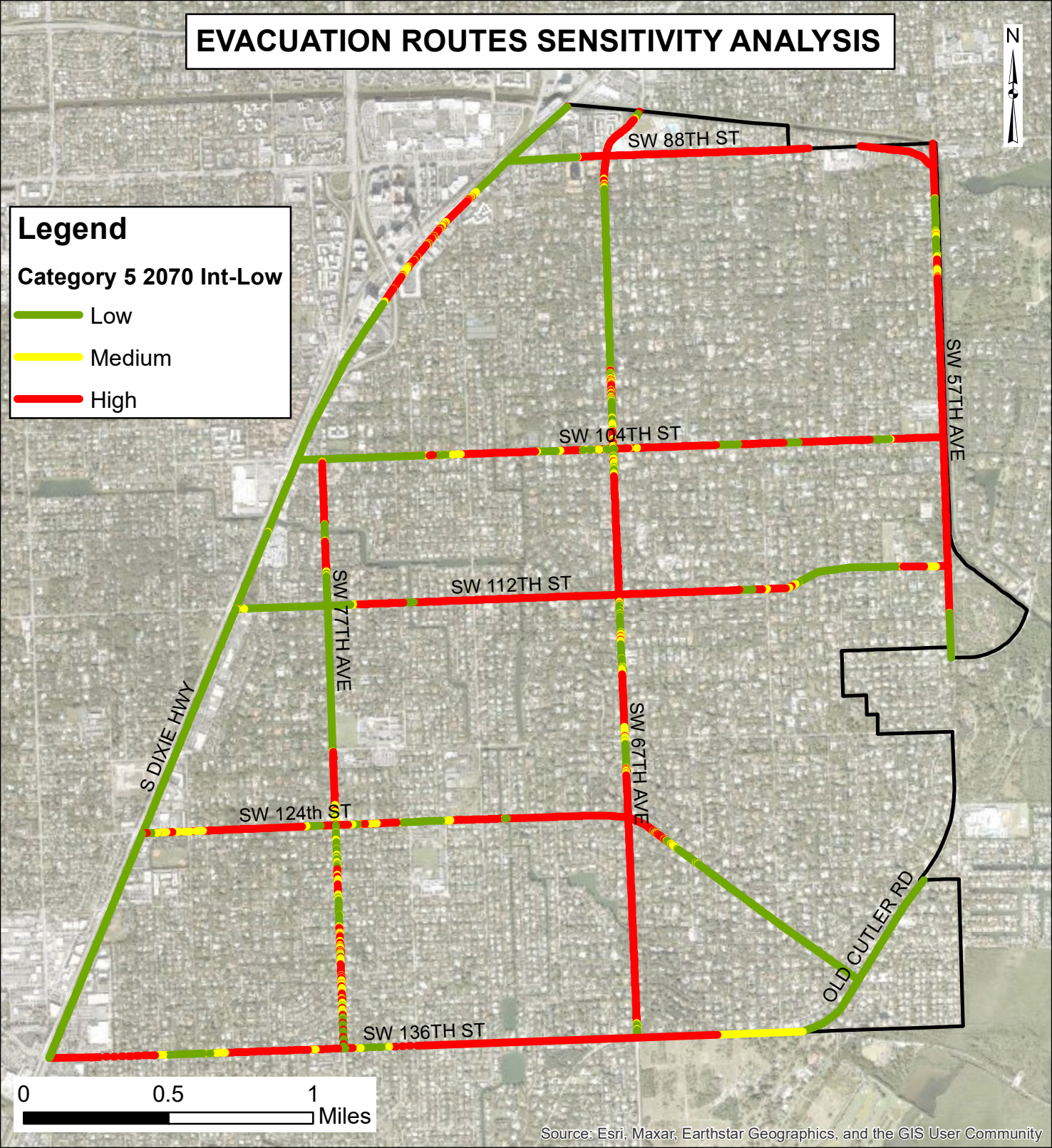
EVACUATION ROUTES SENSITIVITY ANALYSIS



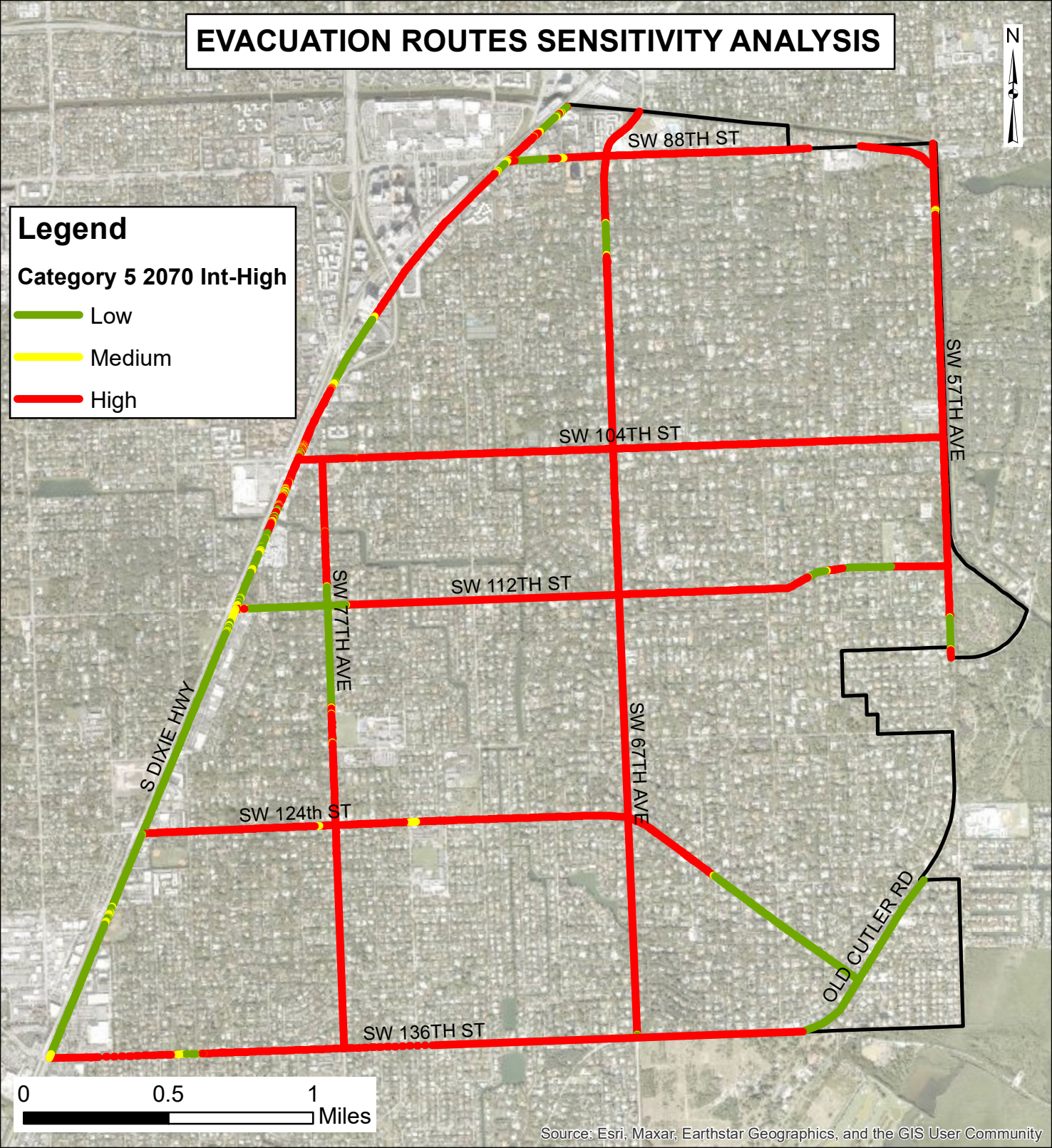
EVACUATION ROUTES SENSITIVITY ANALYSIS



EVACUATION ROUTES SENSITIVITY ANALYSIS



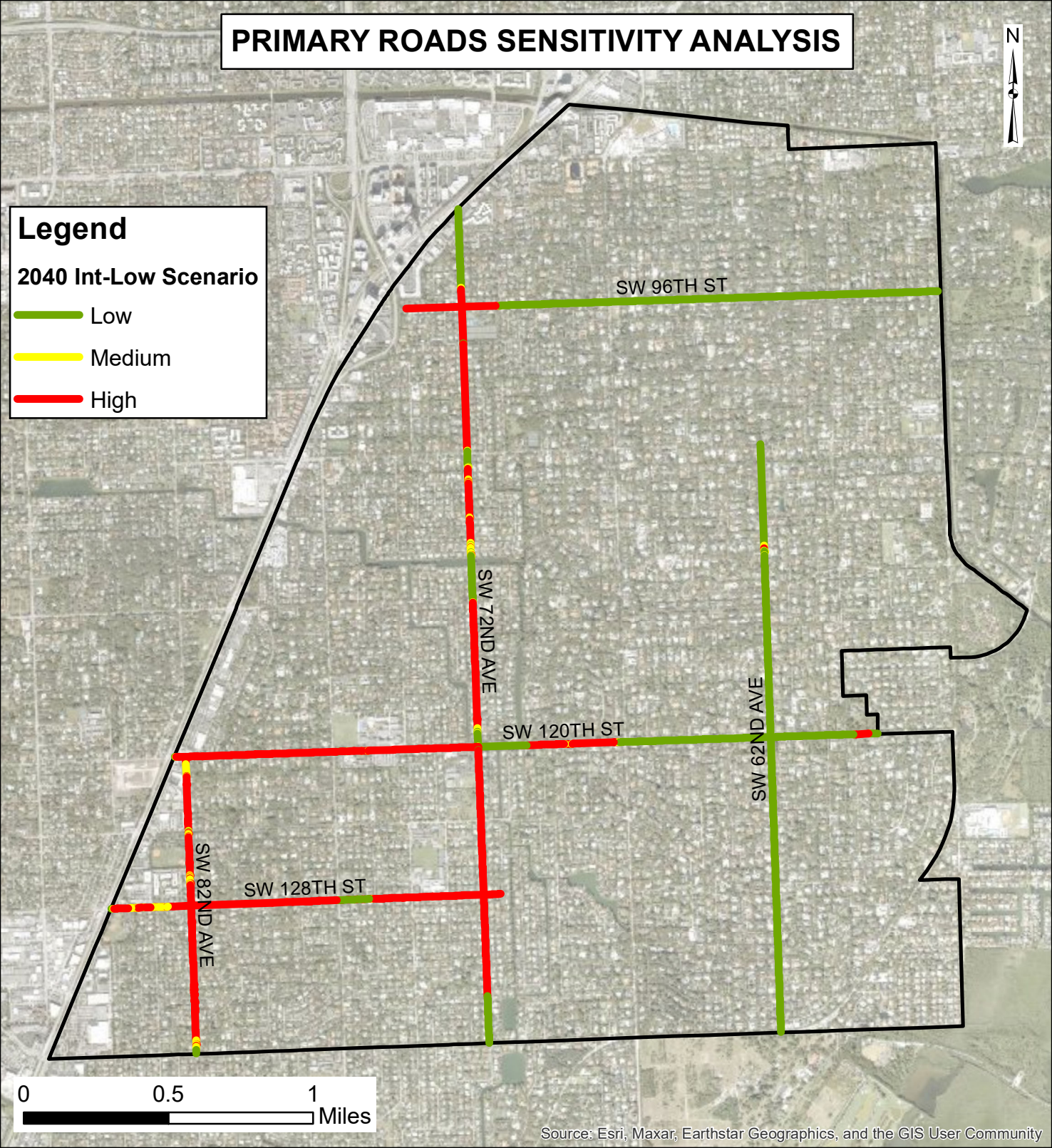
EVACUATION ROUTES SENSITIVITY ANALYSIS

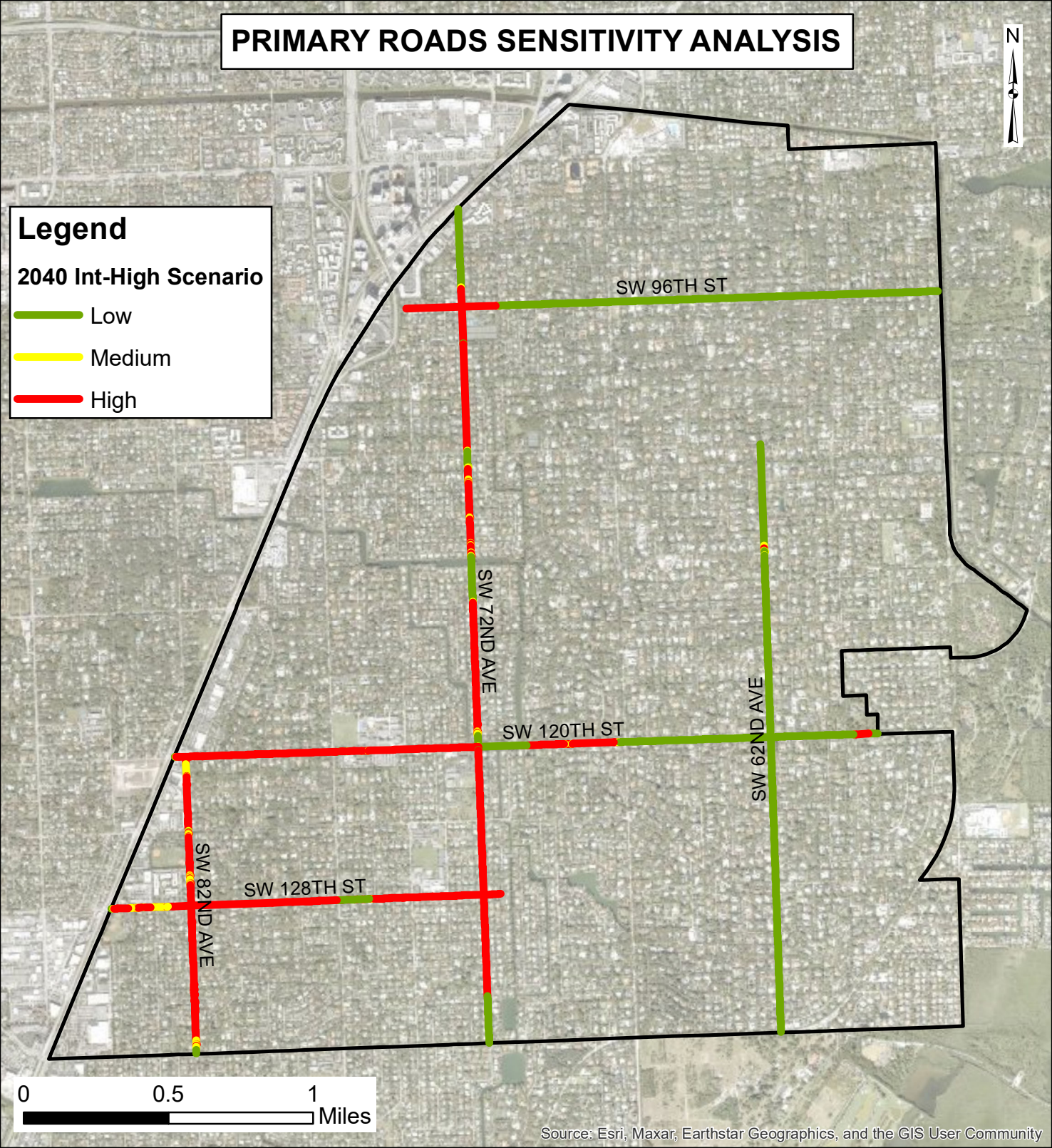


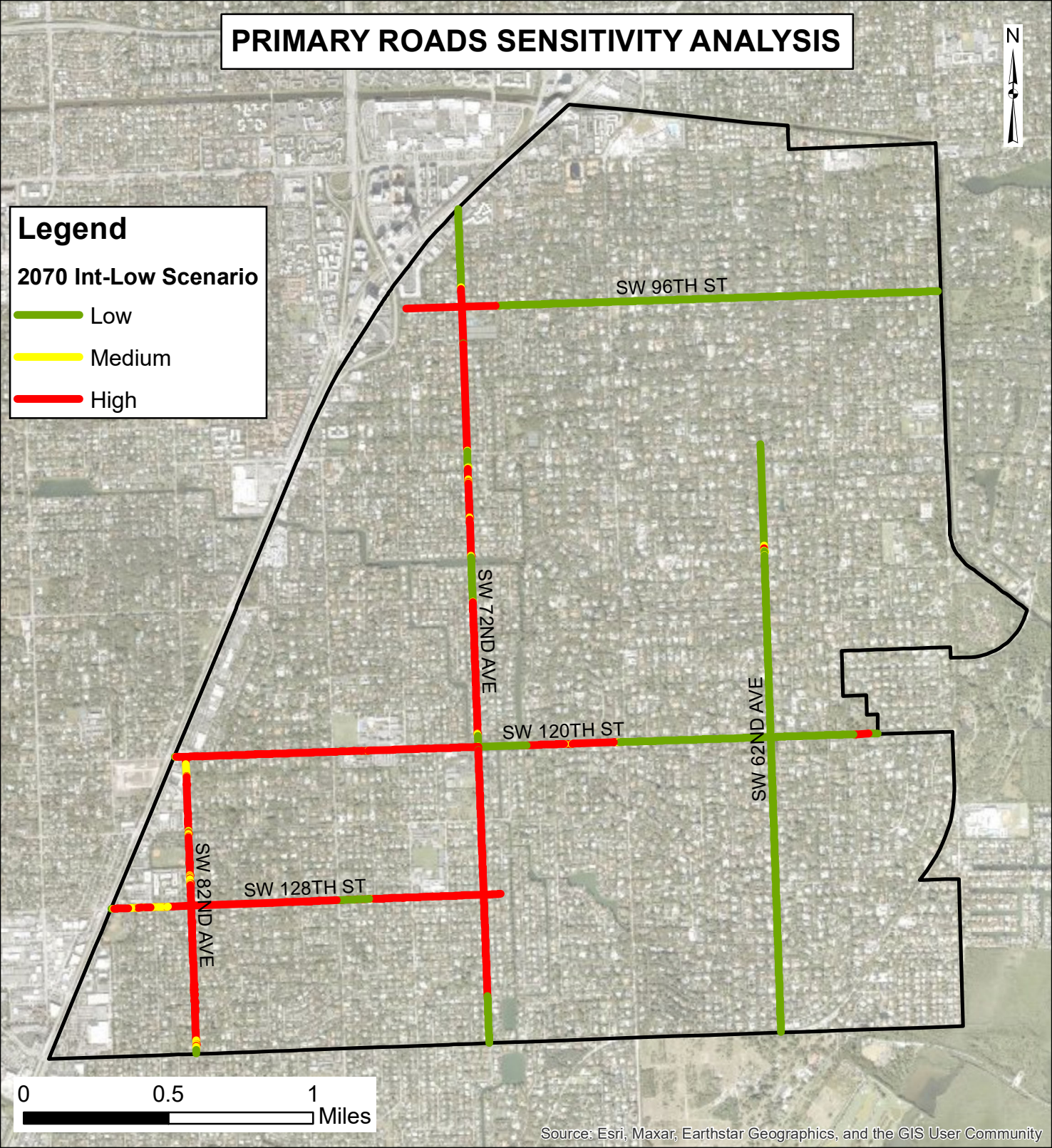
APPENDIX D-2

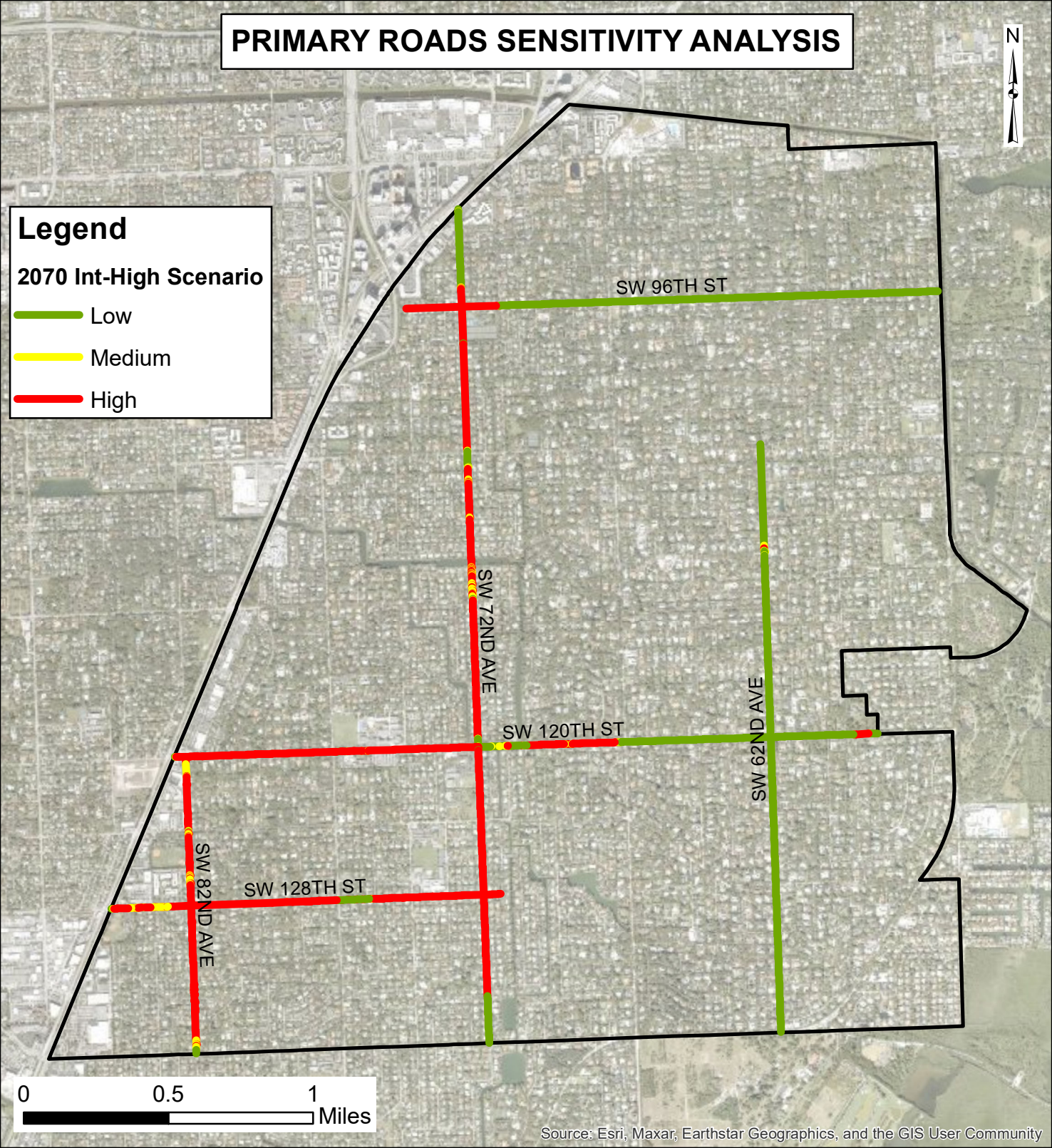
Primary Roads Sensitivity Analysis Maps

SEA-LEVEL RISE SCENARIOS

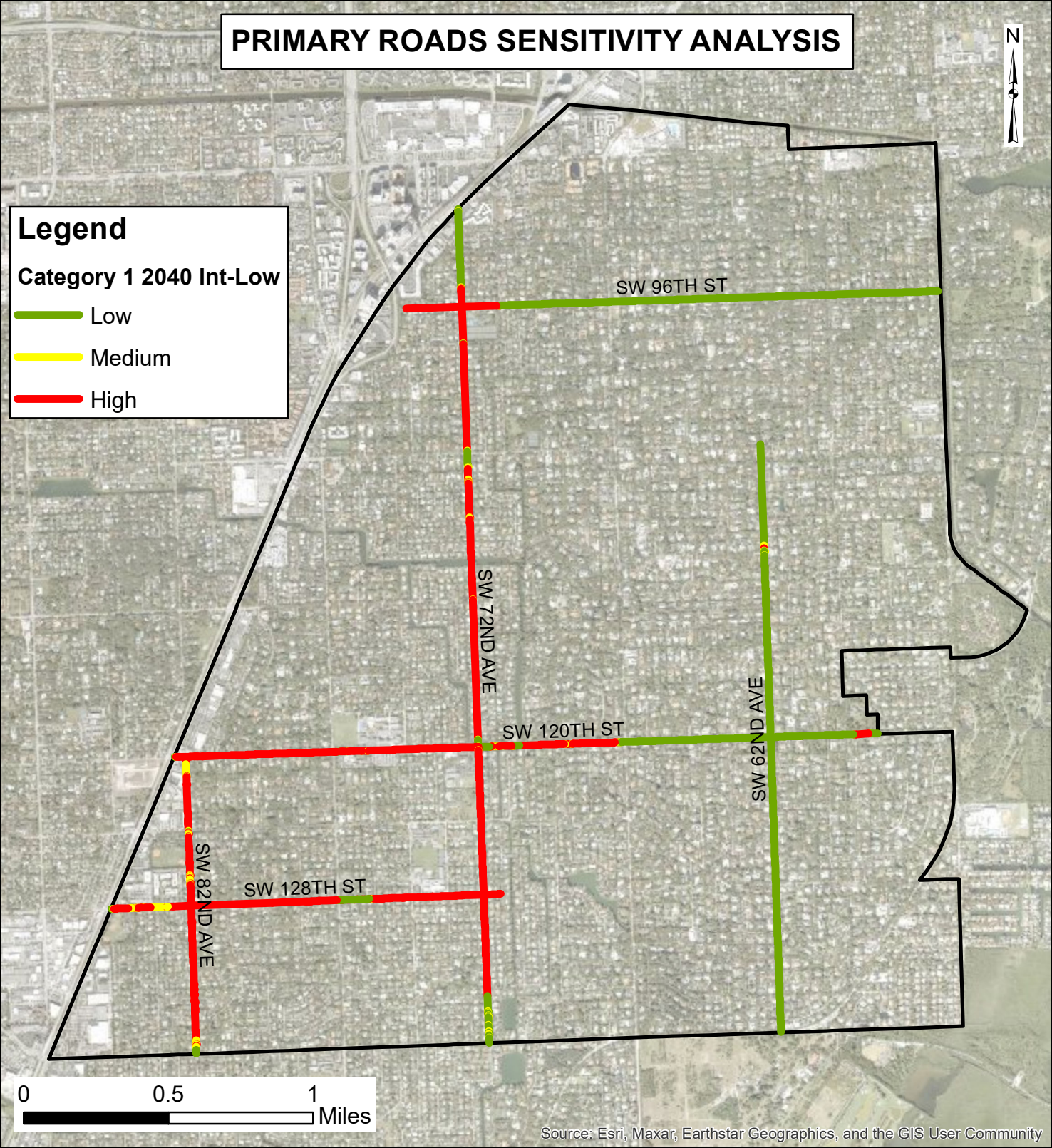

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
2040 Int-Low Scenario
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
2040 Int-High Scenario
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

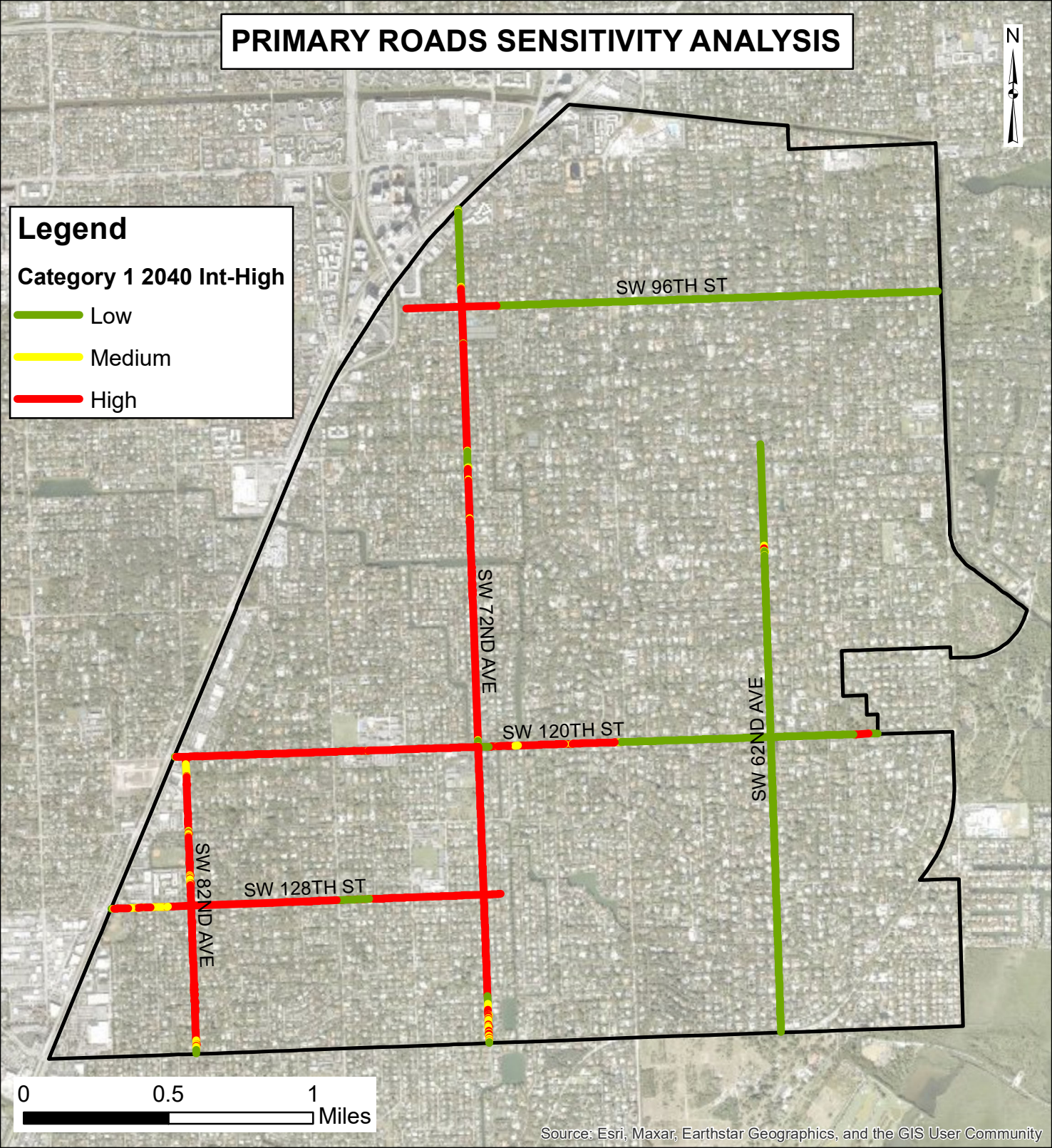

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
2070 Int-Low Scenario
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

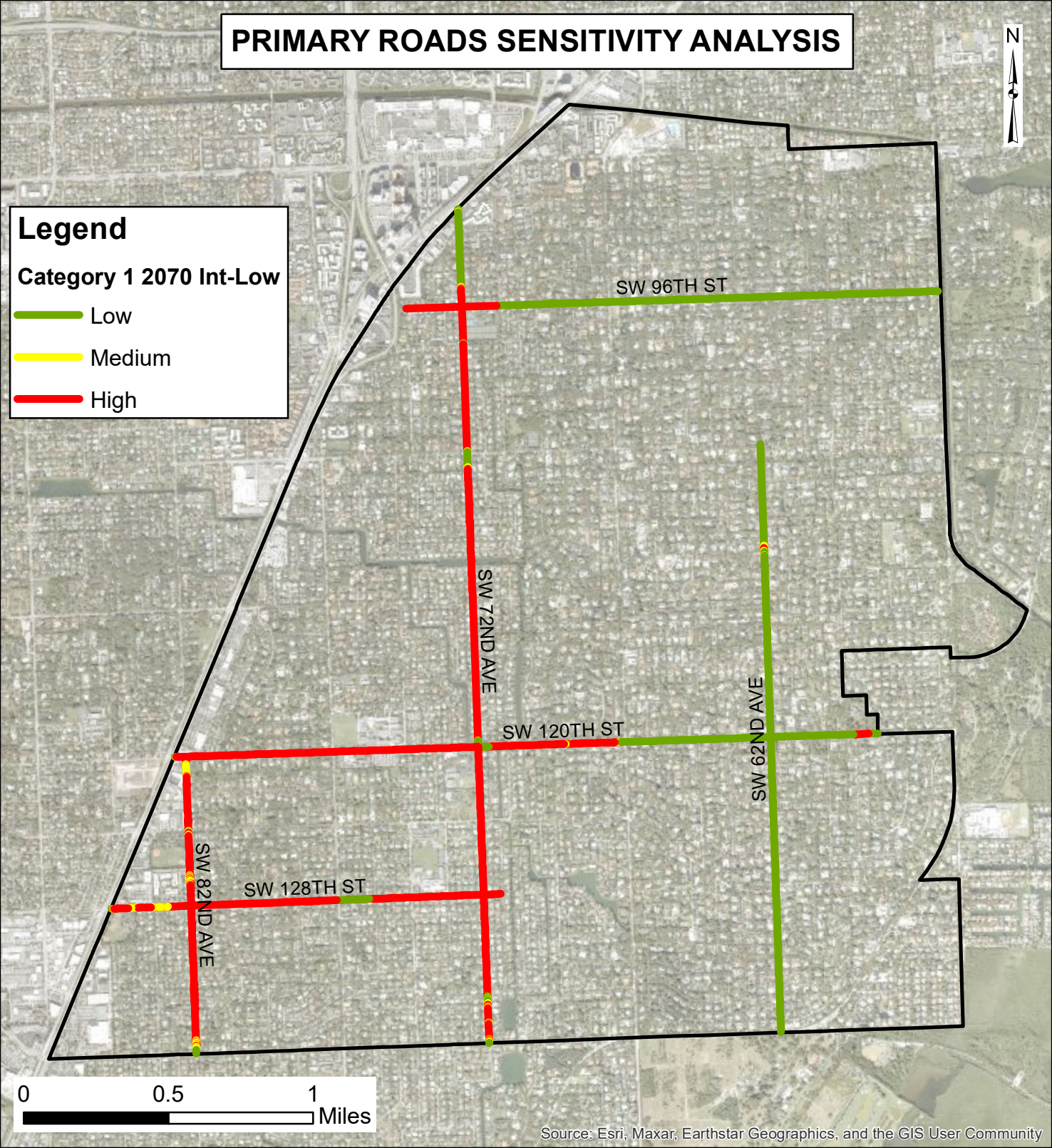

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
2070 Int-High Scenario
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

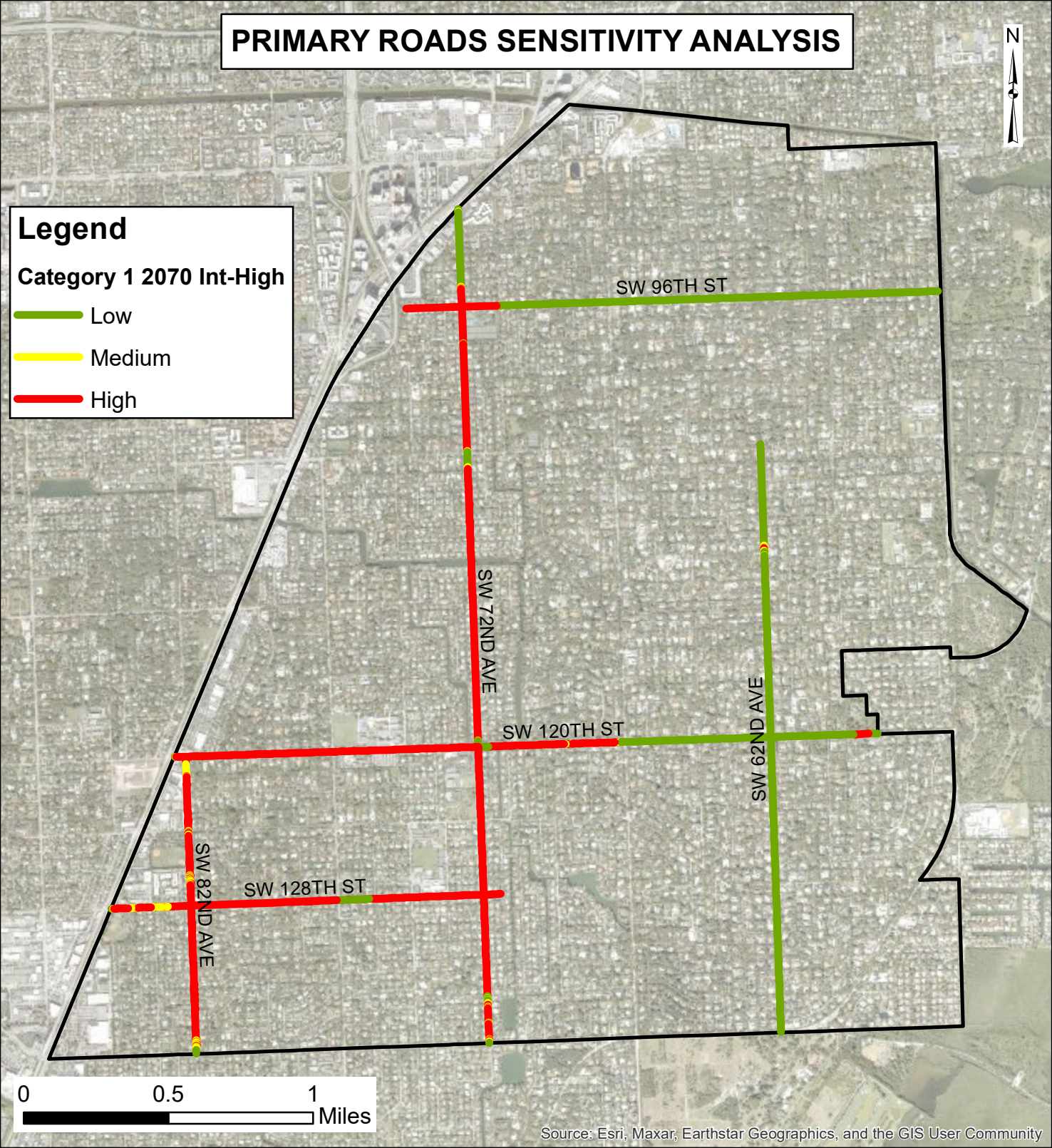
CATEGORY 1 STORM SURGE SCENARIOS


PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 1 2040 Int-Low
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

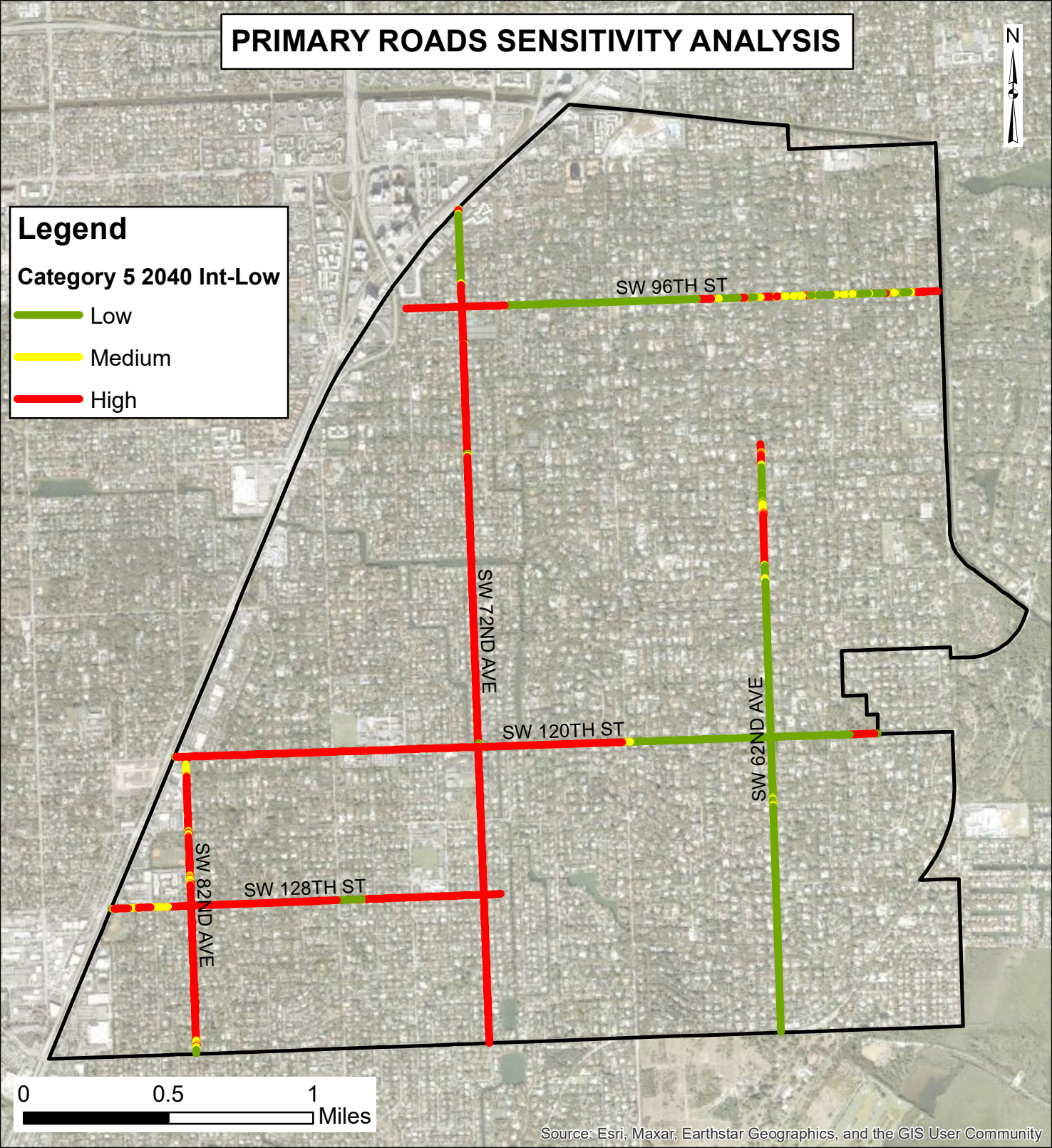
PRIMARY ROADS SENSITIVITY ANALYSIS

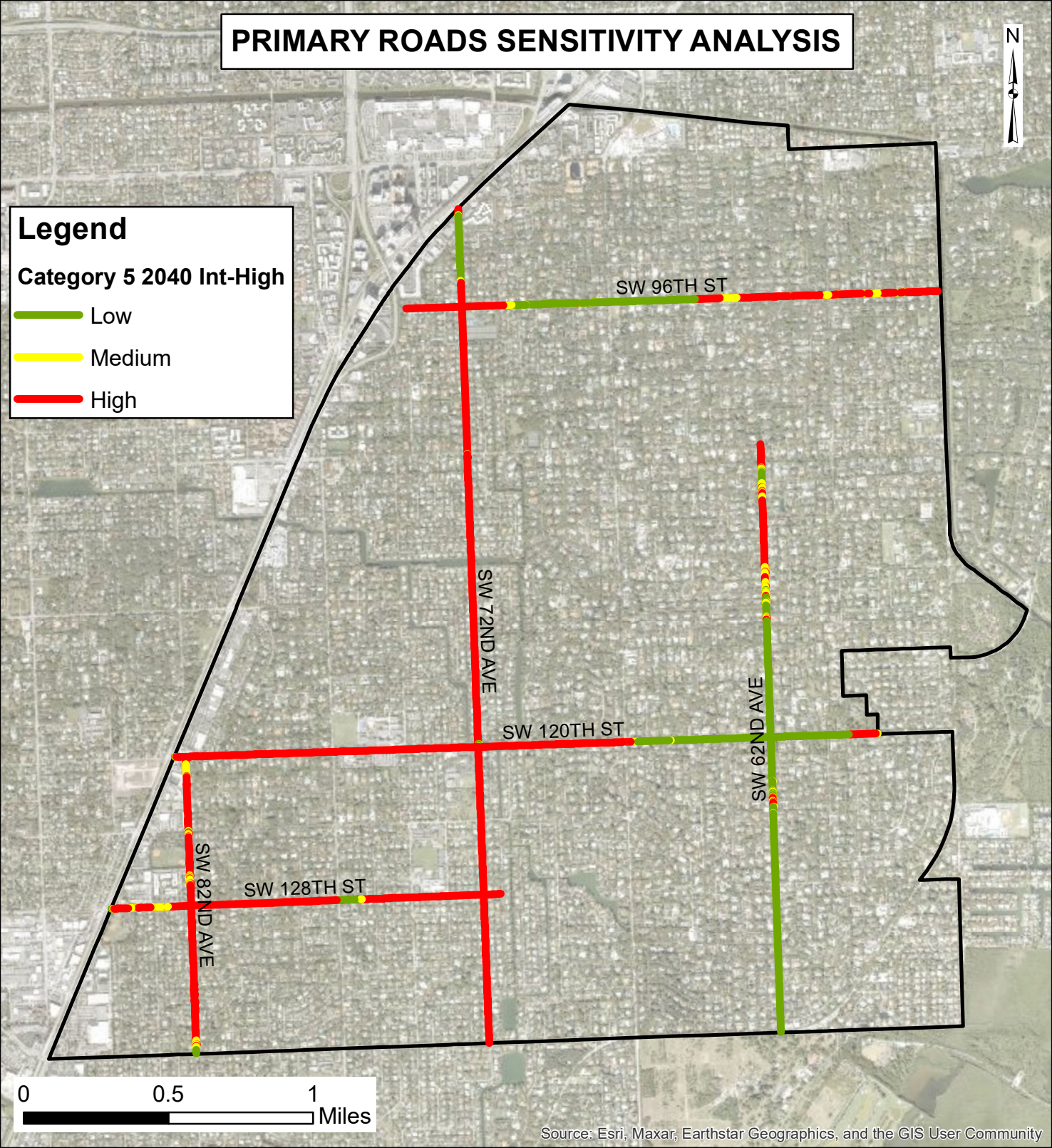


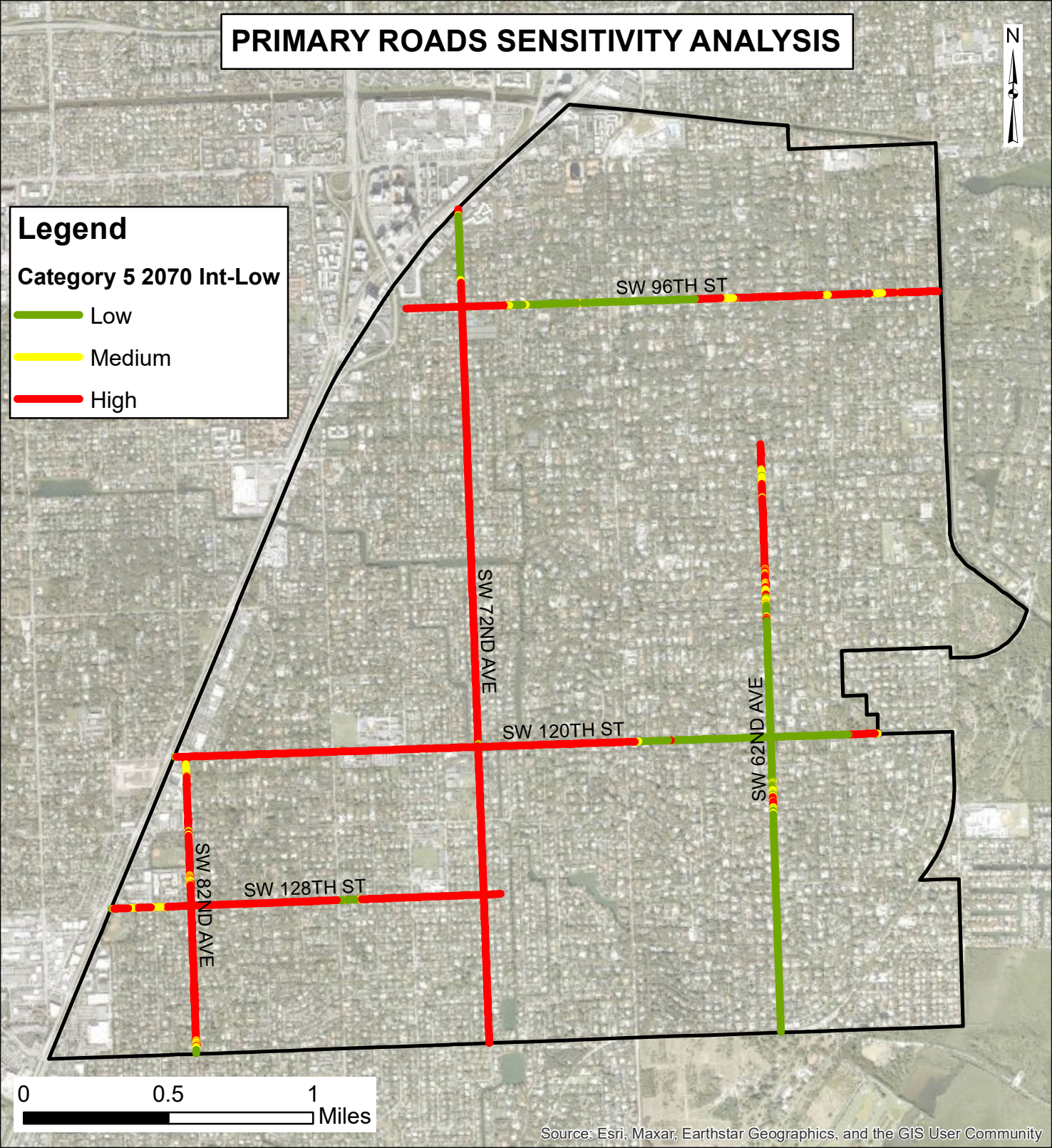

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 1 2070 Int-Low
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

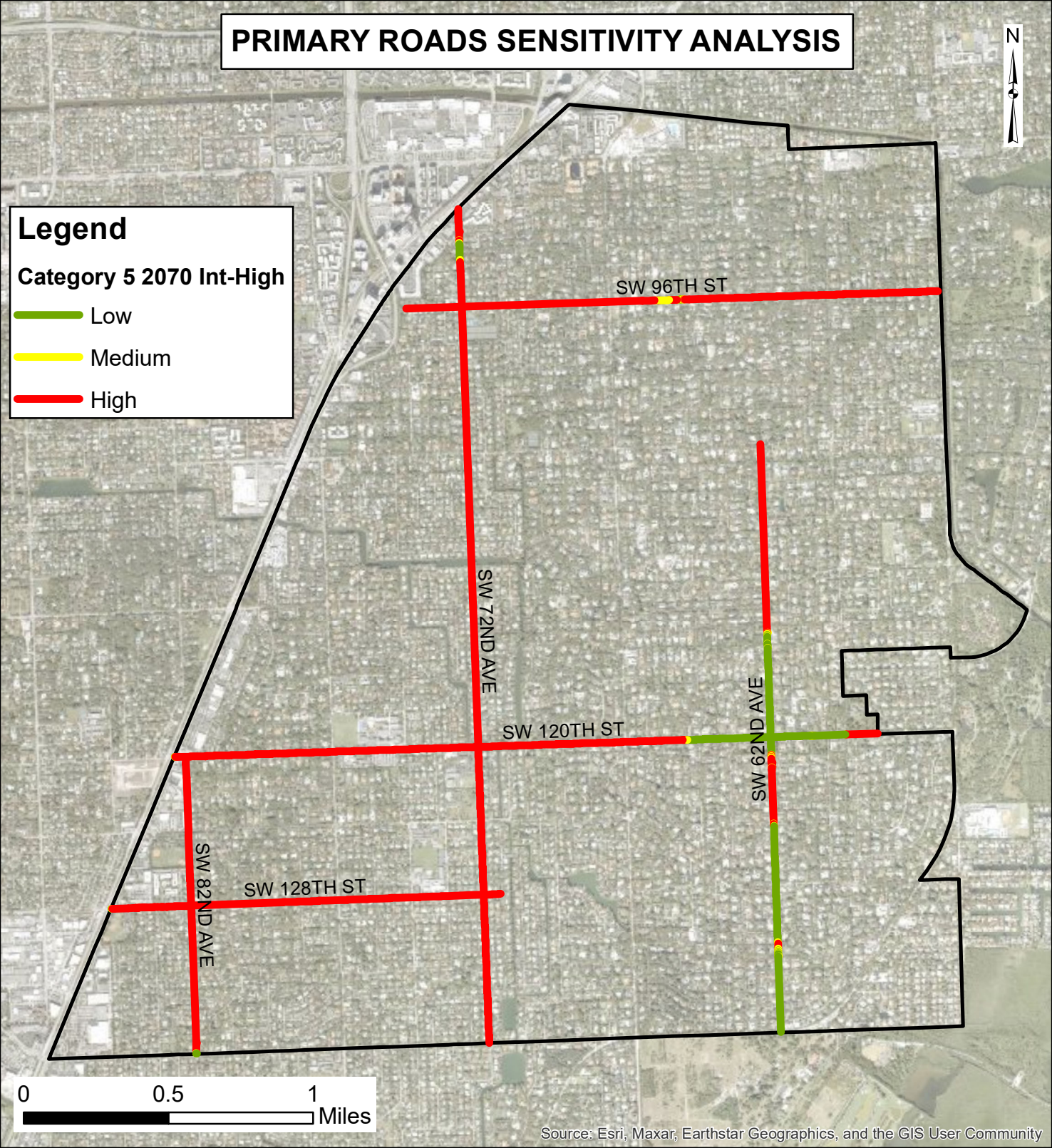

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 1 2070 Int-High
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

CATEGORY 5 STORM SURGE SCENARIOS


PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 5 2040 Int-Low
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

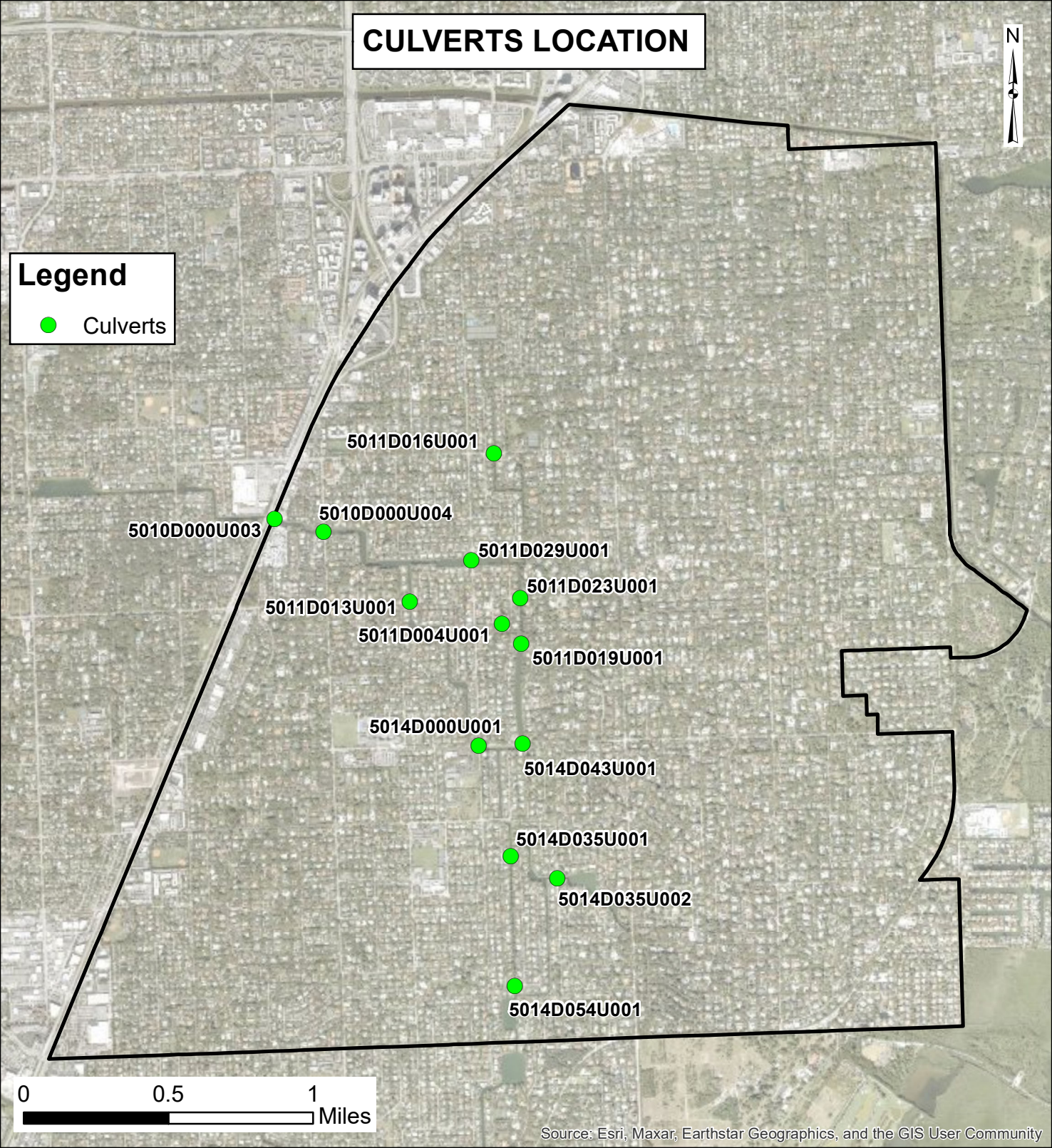

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 5 2040 Int-High
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 5 2070 Int-Low
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
Category 5 2070 Int-High
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

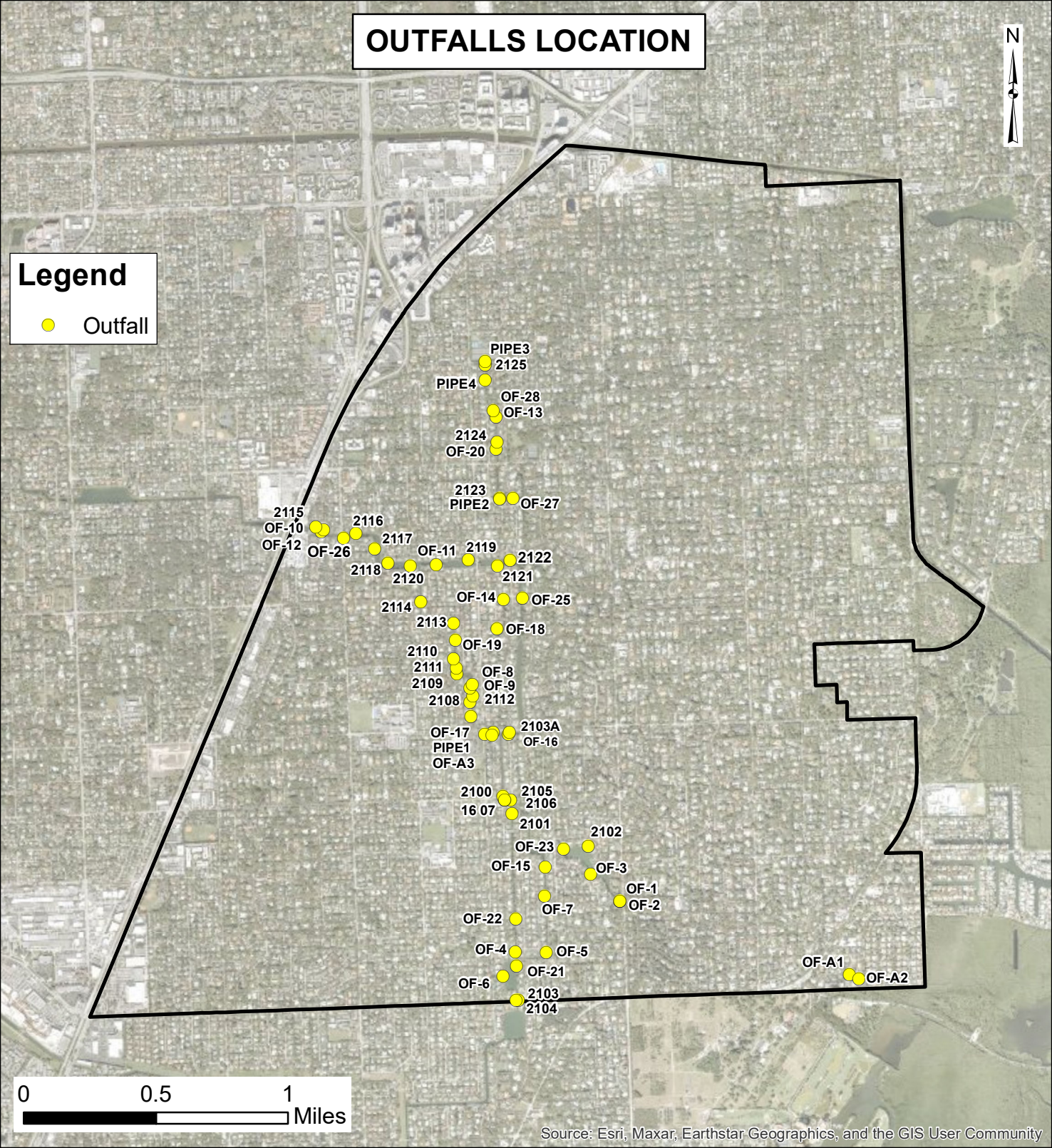
APPENDIX D-3

Culverts Location Map


CULVERTS LOCATION
N
Legend
Culverts
5011D016U001
5010D000U004
5010D000U003
5011D029U001
5011D023U001
5011D013U001
5011D004U001
5011D019U001
5014D000U001
5014D043U001
5014D035U001
5014D035U002
5014D054U001
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

APPENDIX D-4

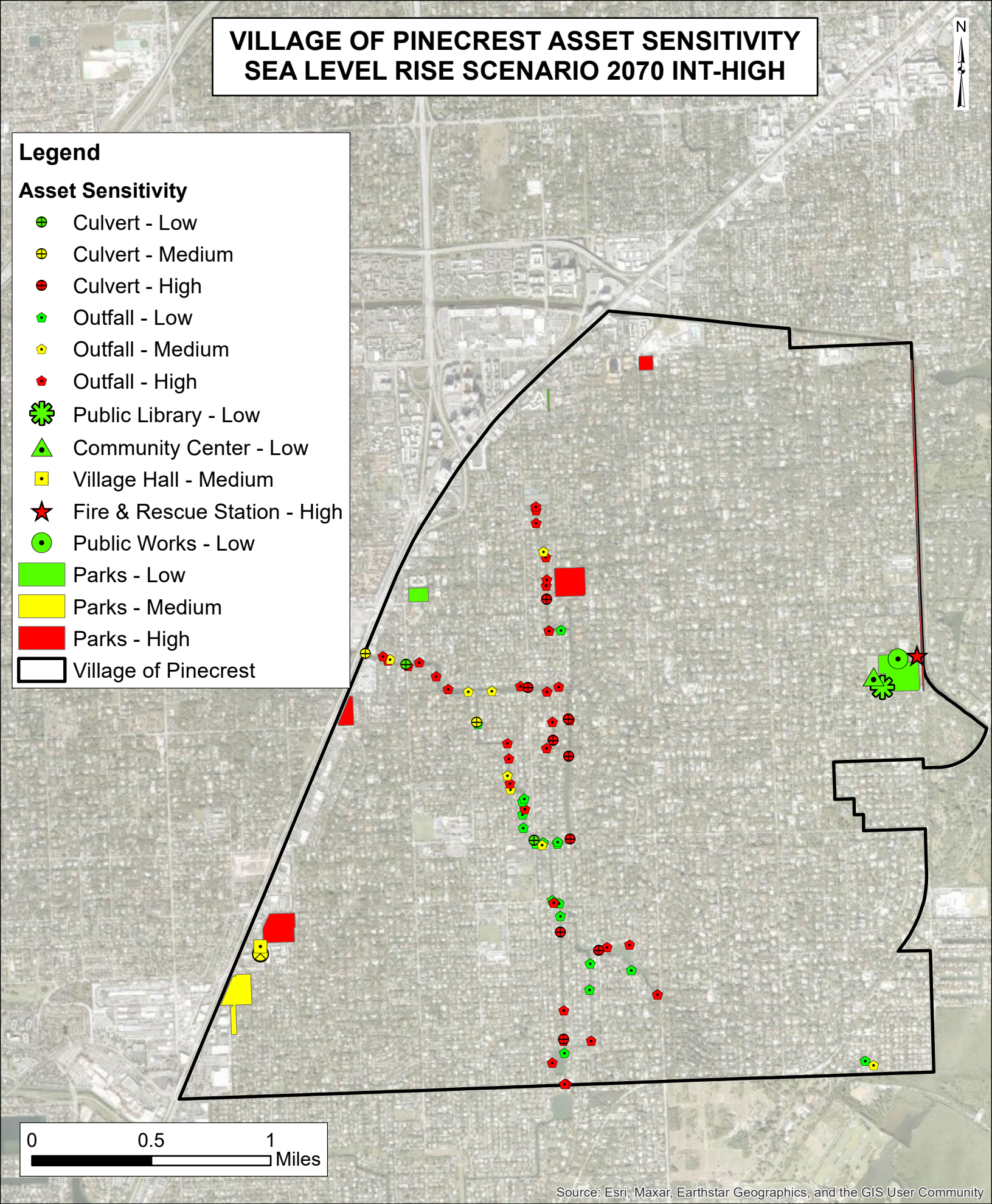
Outfalls Location Map


OUTFALLS LOCATION
N
Legend
Outfall
PIPE3
2125
PIPE4
OF-28
OF-13
2124
OF-20
2123
PIPE2
OF-27
2115
OF-10
OF-12
2116
OF-26
2117
OF-11
2119
2122
2118
2120
2121
OF-14
OF-25
2114
2113
OF-18
OF-19
2110
2111
OF-8
2109
OF-9
2108
2112
OF-17
2103A
OF-16
PIPE1
OF-A3
2100
2105
2106
16 07
2101
2102
OF-23
OF-15
OF-3
OF-1
OF-2
OF-7
OF-22
OF-4
OF-5
OF-21
OF-6
2103
2104
OF-A1
OF-A2
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

APPENDIX E-1

Sensitivity Maps of the Critical Assets for the 2070 Intermediate-High Modeling Scenario

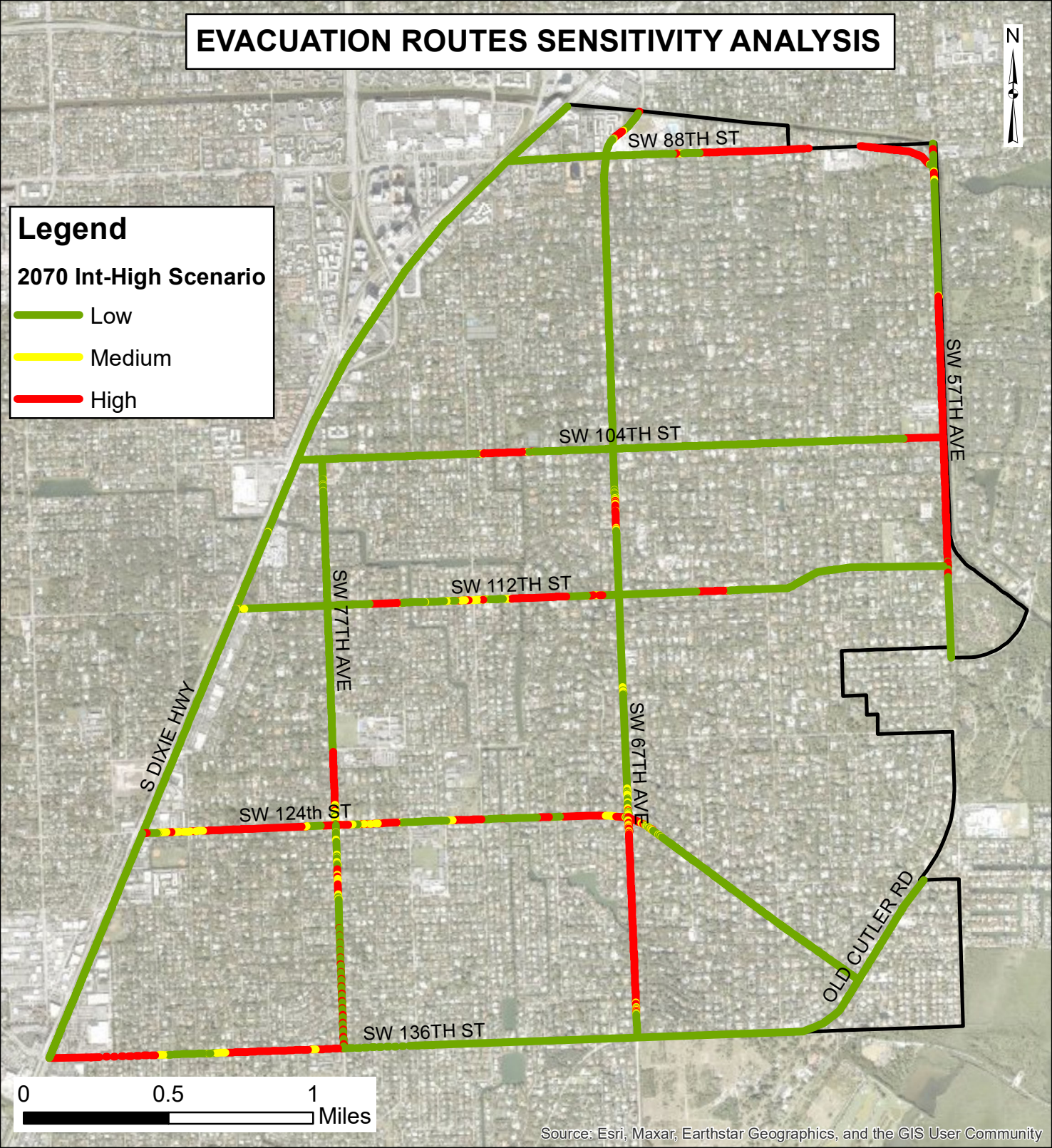
VILLAGE OF PINECREST ASSET SENSITIVITY
SEA LEVEL RISE SCENARIO 2070 INT-HIGH

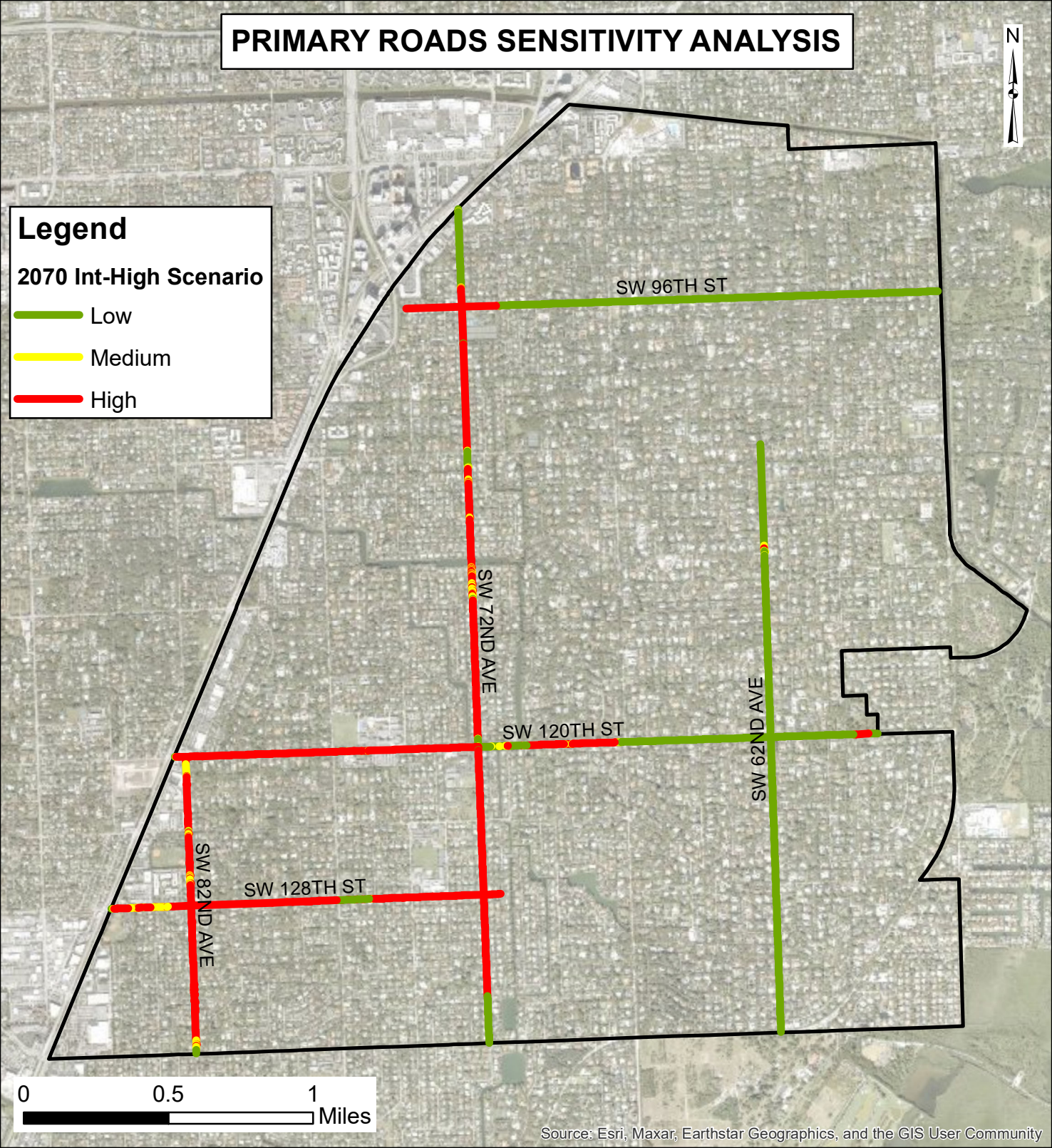


Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

APPENDIX E-2

Sensitivity Maps of the Evacuation Routes and Primary Roads for the 2070 Intermediate-High Modeling Scenario

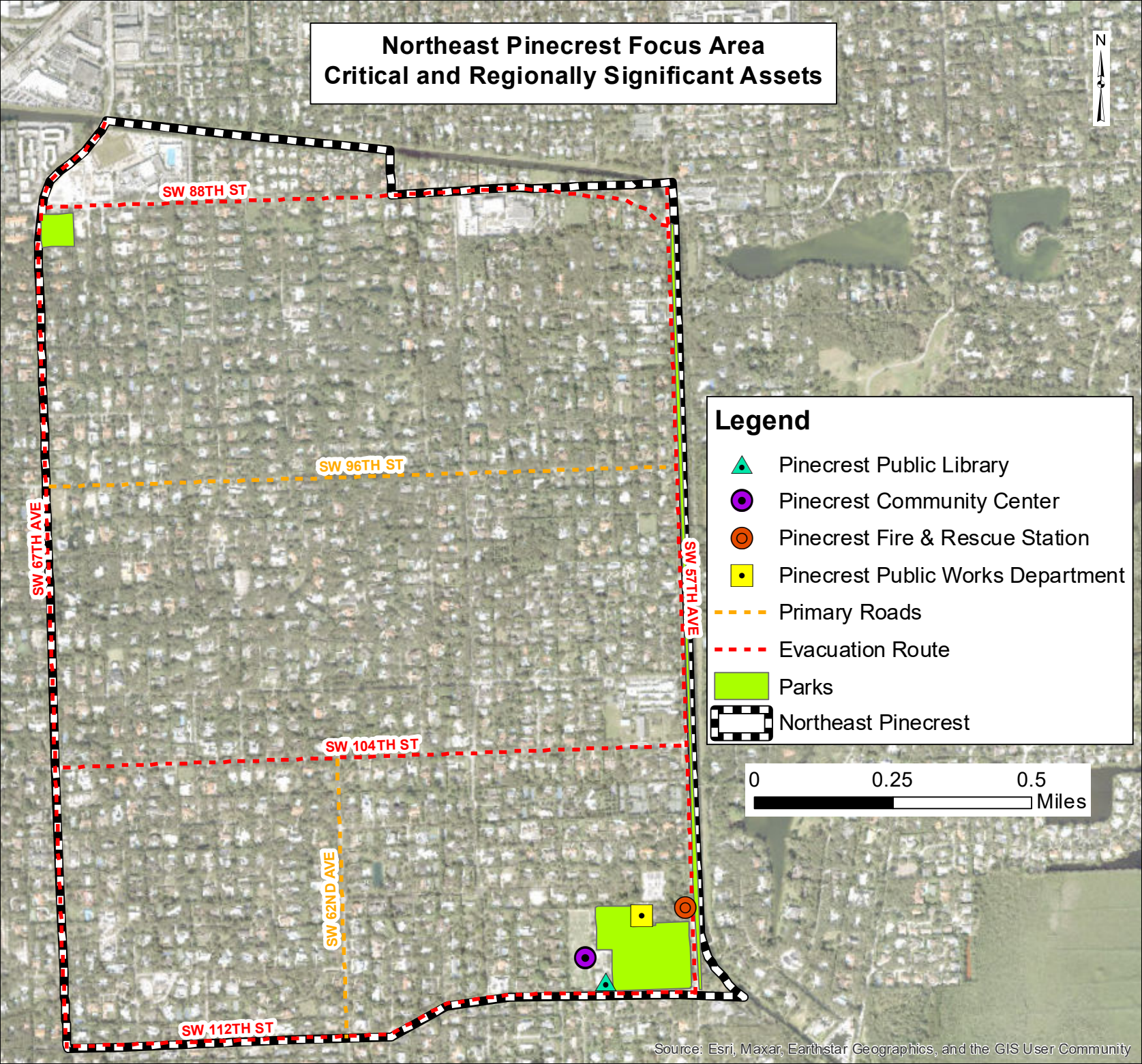

EVACUATION ROUTES SENSITIVITY ANALYSIS
N
Legend
2070 Int-High Scenario
Low
Medium
High
SW 88TH ST
SW 57TH AVE
SW 104TH ST
SW 112TH ST
SW 77TH AVE
S DIXIE HWY
SW 67TH AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

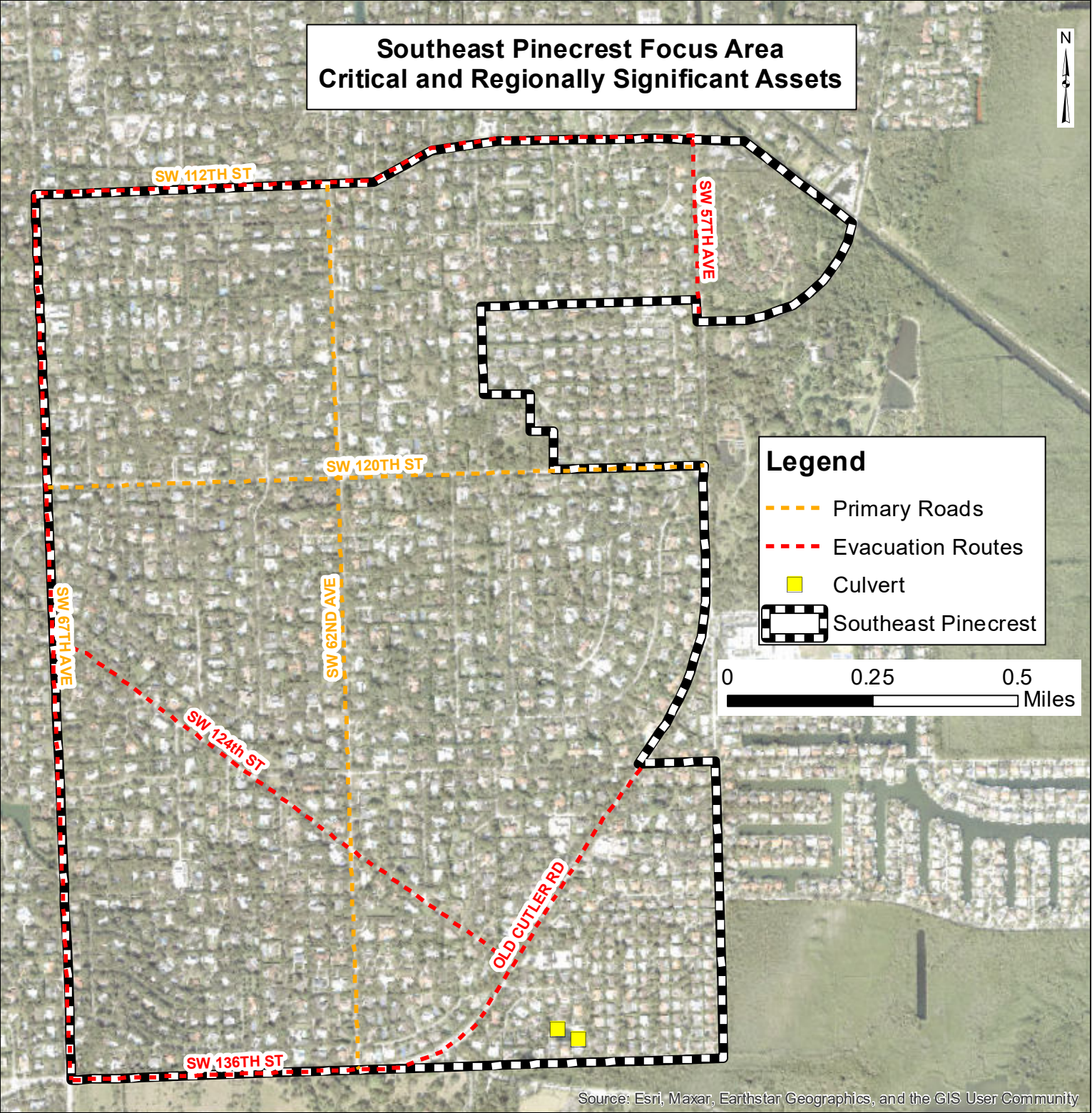

PRIMARY ROADS SENSITIVITY ANALYSIS
N
Legend
2070 Int-High Scenario
Low
Medium
High
SW 96TH ST
SW 72ND AVE
SW 120TH ST
SW 62ND AVE
SW 128TH ST
SW 82ND AVE
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

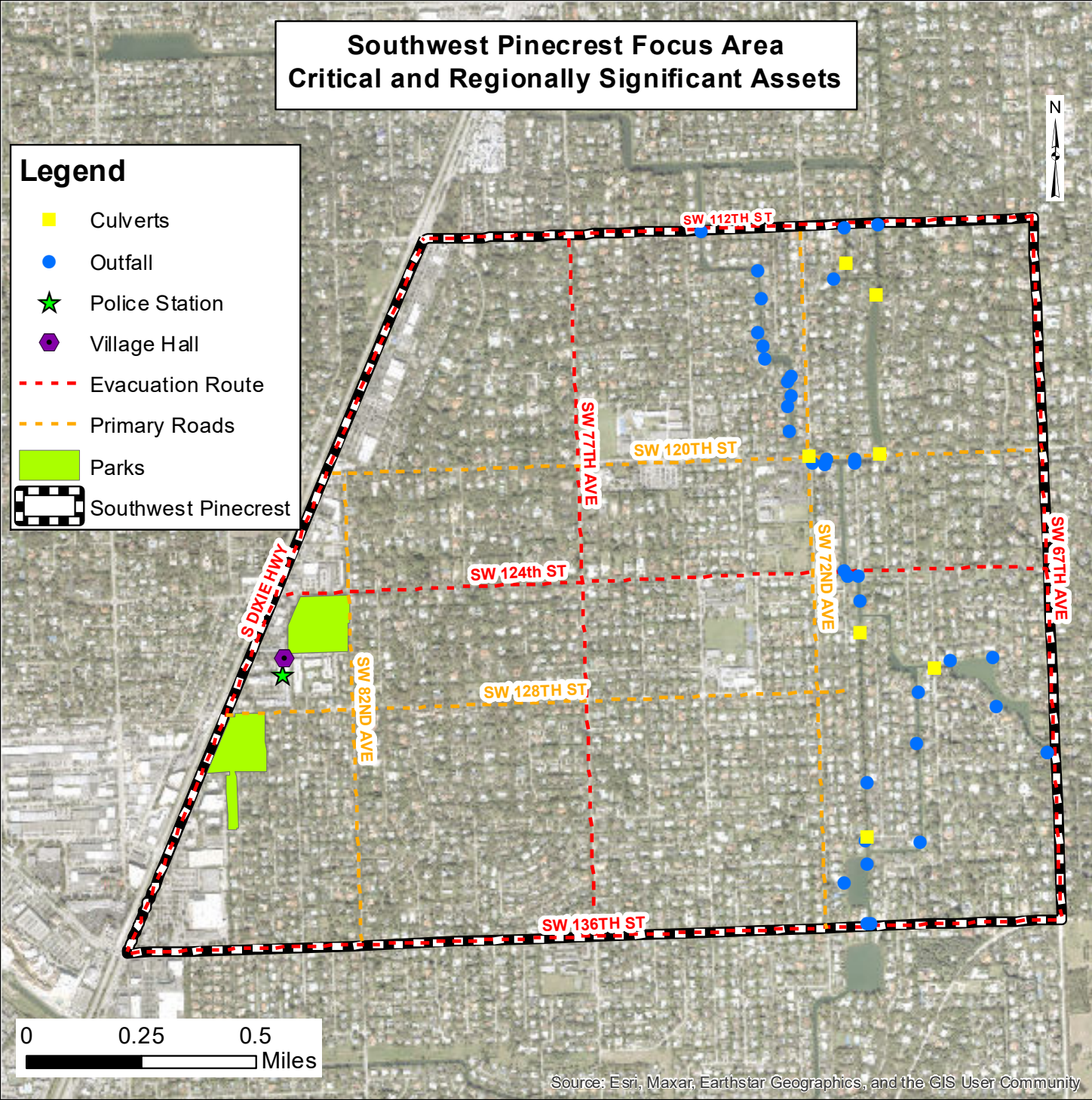
APPENDIX E-3

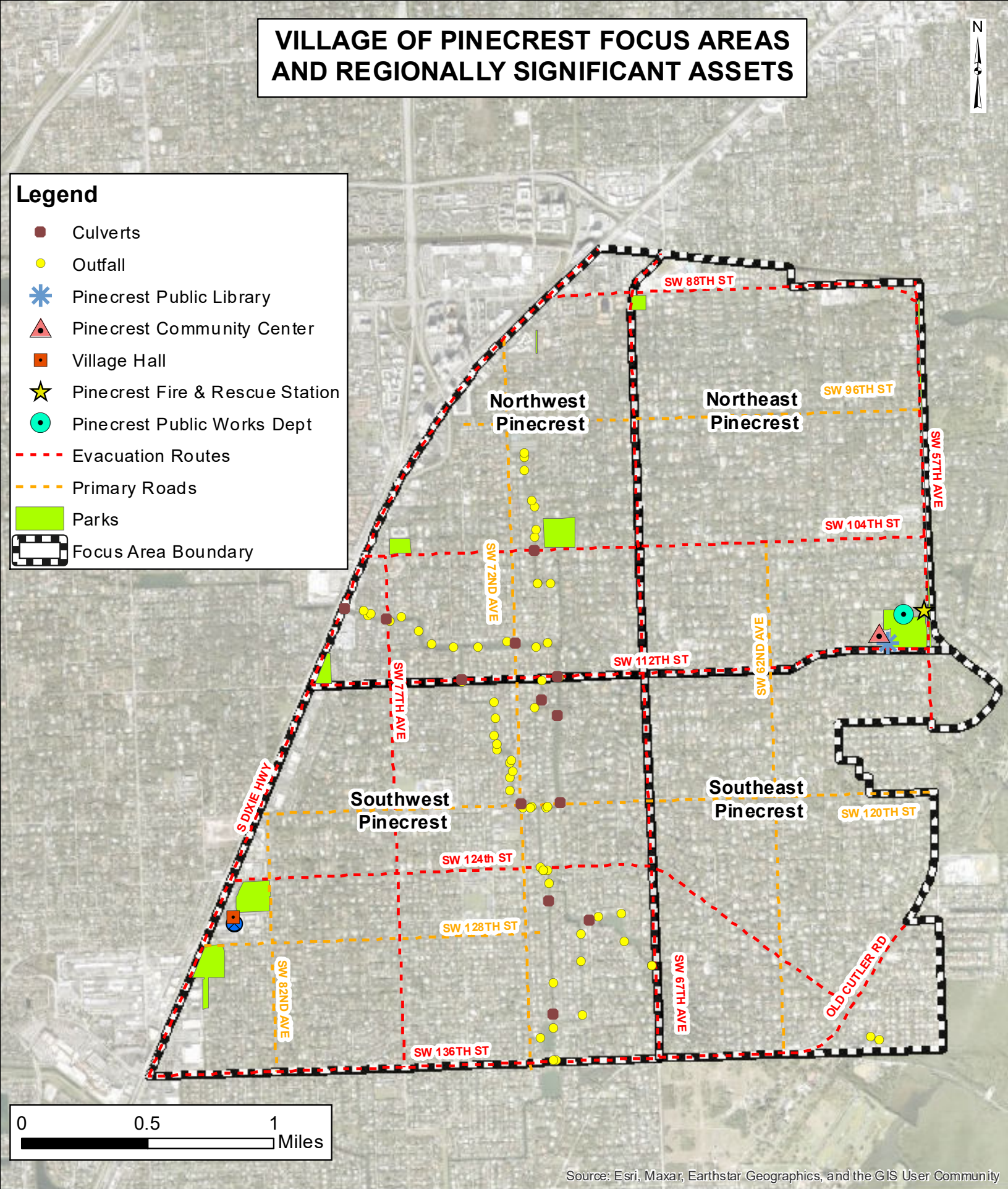
Maps of the Critical Assets Identified Within Each Focus Area


Northwest Pinecrest Focus Area
Critical and Regionally Significant Assets
N
Legend
Culverts
Outfall
Evacuation Route
Primary Roads
Parks
Northwest Pinecrest
SW 88TH ST
SW 72ND AVE
SW 96TH ST
SW 67TH AVE
S DIXIE HWY
SW 104TH ST
SW 77TH AVE
SW 112TH ST
0
0.25
0.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Northeast Pinecrest Focus Area
Critical and Regionally Significant Assets
N
SW 88TH ST
SW 96TH ST
SW 67TH AVE
SW 57TH AVE
SW 104TH ST
SW 62ND AVE
SW 112TH ST
Legend
Pinecrest Public Library
Pinecrest Community Center
Pinecrest Fire & Rescue Station
Pinecrest Public Works Department
Primary Roads
Evacuation Route
Parks
Northeast Pinecrest
0
0.25
0.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Southeast Pinecrest Focus Area
Critical and Regionally Significant Assets
N
SW 112TH ST
SW 57TH AVE
SW 120TH ST
SW 67TH AVE
SW 62ND AVE
SW 124th ST
OLD CUTLER RD
SW 136TH ST
Legend
Primary Roads
Evacuation Routes
Culvert
Southeast Pinecrest
0
0.25
0.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Southwest Pinecrest Focus Area
Critical and Regionally Significant Assets
Legend
Culverts
Outfall
Police Station
Village Hall
Evacuation Route
Primary Roads
Parks
Southwest Pinecrest
N
SW 112TH ST
SW 77TH AVE
SW 120TH ST
SW 72ND AVE
SW 67TH AVE
S DIXIE HWY
SW 124th ST
SW 82ND AVE
SW 128TH ST
SW 136TH ST
0
0.25
0.5
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


VILLAGE OF PINECREST FOCUS AREAS AND REGIONALLY SIGNIFICANT ASSETS
N
Legend
Culverts
Outfall
Pinecrest Public Library
Pinecrest Community Center
Village Hall
Pinecrest Fire & Rescue Station
Pinecrest Public Works Dept
Evacuation Routes
Primary Roads
Parks
Focus Area Boundary
Northwest Pinecrest
Northeast Pinecrest
Southwest Pinecrest
Southeast Pinecrest
SW 88TH ST
SW 96TH ST
SW 104TH ST
SW 112TH ST
SW 120TH ST
SW 124th ST
SW 128TH ST
SW 136TH ST
SW 57TH AVE
SW 62ND AVE
SW 67TH AVE
SW 72ND AVE
SW 77TH AVE
SW 82ND AVE
S DIXIE HWY
OLD CUTLER RD
0
0.5
1
Miles
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

APPENDIX E-4

Tables Listing the Critical Assets Within Each Focus Area

Northeast Pinecrest

Main Category	Asset Type	Address
Critical Community Facilities	Pinecrest Public Library	5835 SW 111th St
	Pinecrest Community Center	5855 Killian Dr
	Pinecrest Fire & Rescue Station	10850 57th Ave
	Pinecrest Public Works Department	10800 SW 57th Ave

Main Category	Asset Type	Location
Transportation Assets	Primary Roads	SW 62nd Ave
		SW 96th St
	Evacuation Routes	SW 88th St
		SW 57th Ave
		SW 112th St
		SW 104th St

Main Category	Asset Type	Address
Natural, Cultural, Historical Assets	Parks	Hidden Pine Park
		Pinecrest Gardens
		Red Road Linear Park

Northwest Pinecrest

Main Category	Asset Type	ID
Critical Infrastructure	Culverts	5011D016U001
	Culverts	5010D000U003
	Culverts	5010D000U004
	Culverts	5011D029U001
	Culverts	5011D013U001
	Culverts	5011D023U001
	Outfalls	2122
	Outfalls	2121
	Outfalls	2119
	Outfalls	OF-11
	Outfalls	2120
	Outfalls	2118

Main Category	Asset Type	ID
Critical Infrastructure	Outfalls	2117
	Outfalls	2116
	Outfalls	OF-26
	Outfalls	2115
	Outfalls	OF-10
	Outfalls	2123
	Outfalls	OF-27
	Outfalls	OF-12
	Outfalls	2124
	Outfalls	OF-20
	Outfalls	OF-13
	Outfalls	OF-28
	Outfalls	PIPE4
	Outfalls	2125
	Outfalls	PIPE3
	Outfalls	PIPE2

Main Category	Asset Type	Address
Transportation Assets	Evacuation Routes	SW 88th St
		SW 67th Ave
		SW 77th Ave
		SW 104th St
		SW 112th St
		S Dixie Hwy
	Primary Road	SW 96th St
		SW 72nd Ave

Main Category	Asset Type	Address
Natural, Cultural, Historical Assets	Parks	Coral Pine Park
		Flagler Grove Park
		Hidden Pine Park
		Linear Park
		Veterans Wayside Park

Southeast Pinecrest

Main Category	Asset Type	ID
Critical Infrastructure	Culverts	OF-A1
		OF-A2

Main Category	Asset Type	Address
Transportation Assets	Primary Roads	SW 62nd Ave
		SW 120th St
	Evacuation Routes	SW 57th Ave
		SW 67th Ave
		SW 112th St
		SW 124th St
		SW 136th St
		Old Cutler Rd

Southwest Pinecrest

Main Category	Asset Type	ID
Critical Infrastructure	Culverts	5011D019U001
	Culverts	5011D004U001
	Culverts	5014D043U001
	Culverts	5014D000U001
	Culverts	5014D035U001
	Outfalls	16 07
	Outfalls	2100
	Outfalls	2101
	Outfalls	2102
	Outfalls	2103
	Outfalls	2103A
	Outfalls	2104
	Outfalls	2105
	Outfalls	2106
	Outfalls	2108
	Outfalls	2109
	Outfalls	2110
	Outfalls	2111
	Outfalls	2112
	Outfalls	2113
	Outfalls	2114
	Outfalls	OF-A3
	Outfalls	OF-1
	Outfalls	OF-14
	Outfalls	OF-15
	Outfalls	OF-16
	Outfalls	OF-17
	Outfalls	OF-18
	Outfalls	OF-19
	Outfalls	OF-2
	Outfalls	OF-21
	Outfalls	OF-22
	Outfalls	OF-23
	Outfalls	OF-24

Main Category	Asset Type	ID
Critical Infrastructure	Outfalls	OF-25
	Outfalls	OF-3
	Outfalls	OF-4
	Outfalls	OF-5
	Outfalls	OF-6
	Outfalls	OF-7
	Outfalls	OF-8
	Outfalls	OF-9
	Outfalls	PIPE1

Main Category	Asset Type	Address
Critical Community Facilities	Police Station	12645 Pinecrest Parkway
	Village Hall	12645 Pinecrest Parkway

Main Category	Asset Type	Address
Transportation Assets	Evacuation Routes	SW 67th Ave
		SW 77th Ave
		SW 112th St
		SW 124th St
		SW 136th St
		S Dixie Hwy
	Primary Roads	SW 72nd Ave
		SW 82nd Ave
		SW 120th St
		SW 128th St

Main Category	Asset Type	ID
Natural, Cultural, Historic Assets	Parks	Evelyn Greer Park
		Suniland Park