

Final Report:
Update and Development of Wind Speed Line Maps for the Florida Building Code, 8th Edition (2023)

June 30th, 2023

The State of Florida Department of Business and Professional Regulation
Florida Building Commission
and

University of Florida, GeoPlan Center

Project Leader: Katherine Norris, Univ. of Florida

1. Introduction

In this project, the University of Florida (UF) GeoPlan Center is providing Geographic Information System (GIS) technical assistance for creating updated Florida statewide Ultimate Design Wind Speed line maps for the 8th Edition (2023) update to the Florida Building Code (FBC). Updates to Figures: 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4) will be based on the standards set forth in Chapter 26 of the American Society of Civil Engineers (ASCE), the Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-22).

In addition, the GeoPlan Center shall provide GIS technical assistance in preparing local wind speed line maps for each building code jurisdiction that is impacted and dissected by the wind speed contours as updated and depicted in the draft Florida Building Code, 8th Edition (2023) Figures 1609.3(1-4) Risk Categories I - IV Buildings and Structures.

This final report addresses details of the project's progress to date on each task listed in the scope of work. In summary, Task 1 is complete, and Task 2 is complete.

2. Task Progress

a. Task 1: Update Statewide Maps for the 8th Edition (2023) update to the Florida Building Code (Complete).

In this task, the UF GeoPlan Center created updated statewide maps for use in the 8th Edition (2023) update to the Florida Building Code for the following Figures: 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4), as well as the Wind-borne Debris Region Map.

Status: Task 1 is complete, with the following work conducted:

- The UF GeoPlan Center worked with Lauren Mudd PhD, PE (lmudd@ara.com). Senior Engineer at Applied Research Associates, IntraRisk to obtain the GIS data (line work) for the ASCE 7-22 GIS contours for Risk Categories I-IV.
- Using the GIS data obtained above, UF GeoPlan created updated statewide maps for use in the 8th Edition (2023) update to the Florida Building Code for the following Figures: 1609.3(1), 1609.3(2), 1609.3(3), 1609.3(4) as well as the Wind-borne Debris Region Map.
- These five JPEG maps as submitted to Mo Madani, Technical Director, are displayed at the end of this document in **Appendix A** - Statewide Maps for the 8th Edition (2023) update to the Florida Building Code. Figures: 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4), as well as the Wind-borne Debris Region Map.

b. Task 2: Develop Local Wind Speed Line Maps (Complete)

In this task, the UF GeoPlan Center is creating local wind speed line maps for impacted jurisdictions utilizing GIS maps and relevant data. This task has three subtasks (Parts 1, 2, and 3). In Part 1, the UF GeoPlan Center is creating preliminary local wind speed line maps for impacted jurisdictions utilizing GIS maps and relevant data. GIS datasets from the Florida Geographic Data Library (such as major roads, canals, rivers, and lakes) will be used for determining the exact location of the local wind speed lines. In Part 2, the UF GeoPlan Center is working with jurisdictions that require GIS support to make changes or updates to their local wind speed line maps. In Part 3, the UF GeoPlan Center will provide digital copies of the local wind speed line maps to the Department of Business and Professional Regulation in the following format: (1) Raster: .jpg file (2) Raw: ArcGIS file, and (3) Vector: Adobe PDF file.

Status: Task 2 is complete, with the following work conducted:

Task 2, Part 1 (Complete)

- Using the GIS data obtained above, UF GeoPlan created 268 Countywide Risk Category I-IV wind speed line maps. These maps are currently referred to as “preliminary” and can be found at the following web address:
 - https://adhoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/Preliminary_County_PDFs_Draft_20230322/
 - Alachua County Examples of the Risk Category I-IV Preliminary Countywide PDF Maps are displayed at the end of this document in **Appendix B**.

Task 2, Part 2 (Complete)

- UF GeoPlan Center emailed all 67 County Building Code Officials to notify them of the preliminary maps and to offer free assistance to update/modify existing line work and maps to better align with on the ground landmarks.
 - A copy of the email is displayed at the end of this document in **Appendix C**.
 - An initial follow-up phone call to the email has been placed to all counties.

- c. The UF GeoPlan Center created an ArcGIS Online (AGOL) web map viewer to facilitate the creation of updated local wind speed maps based off local landmarks. Additionally, the AGOL web map viewer is being used to track the status of each county’s wind speed map adoption. The web map viewer can be accessed at following URL:
 - <https://ufl.maps.arcgis.com/apps/mapviewer/index.html?webmap=3a5d5dd7d44744eeb9537b76534a72a9>
- d. The UF GeoPlan Center created a supporting document for the web map viewer, Ultimate Design Wind Speeds, Vult, For Risk Categories I-IV Buildings and Other Structures Map Viewer (2023) Manual.
 - This document contains instructions on how to access and use the Ultimate Design Wind Speeds Map Viewer to compare 2020 and 2023 wind speed lines (pages 1-3), how to use the ASCE 7 Hazard Tool to look up design parameters (page 4), and how to download wind speed data (page 5).
 - The contents of the PDF manual are displayed at the end of this document in **Appendix D**.
- e. State level progress of Task 2 Part 2, as of June 8th, 2023 the UF GeoPlan Center has contacted all 67 Counties by both email and phone. To date, 65 Counties (97%) are complete at this time. Task 2 Part 2’s state level progress is detailed below:
 - 38 Counties are adopting the preliminary map “As Is”
 - 14 Counties have been assisted by GeoPlan and are adopting local landmarks maps.
The modified maps can be found at the following URL:
https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/Landmark_County_PDFs_Draft_2023/
 - 13 Counties have developed their own local landmark maps.
 - 2 Counties are still determining how they would like to move forward with their map.
 - The detailed county level progress of Task 2 Part 2 is displayed at the end of this document in **Appendix E**.

Task 2, Part 3 (Complete)

Part 3 is complete. The final product (JPG and PDF Files) are being provided to the state in the following four zip file packages:

- Final Product Location:
 - https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/final/
 - Task 1 Final Product: Final Figures for 1609.3(1-4) in JPG format

- https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/final/FBC_2023_Figures_1609_3_JPGs_20230504.zip
 - Task 2 Final Products:
 - All Original County-wide Risk Category I-IV PDF Maps
 - https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/final/Original_Countywide_Risk_Category_I_to_IV_Maps_20230322.zip
 - Statewide GIS Data for Risk Category I-IV Maps
 - https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/final/FBC2023_windzones_cat1_to_cat4_gis_data_20230322.zip
 - All Local Landmark Based County-wide Risk Category I-IV PDF Maps
 - https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/final/Local_Landmark_Countywide_Risk_Category_I_to_IV_Maps_20230612.zip

3. Plans for continued assistance through the end of June 30th, 2023.

The UF GeoPlan Center is continuing to contact the remaining 2 counties by phone and email to determine how best to assist them. The UF GeoPlan Center will continue to provide GIS technical support and mapping assistance to counties until Friday June 30th, 2023. Based on the results of the 2020 wind speed mapping project, GeoPlan is estimating that 1 county will need mapping assistance and 1 will most likely adopted the maps “As Is.”

4. Recommendations and Future Project Suggestions

For future updates to the Categories I-IV Wind Speed Maps, we suggest FBC consider the following points to facilitate a more efficient update process:

- To facilitate better communication between the GIS Mapping Team and each Local Jurisdiction’s Chief Building Official, we recommend that FBC send an introductory email via the State’s email list serve announcing the map update and introducing the contact who will conduct the mapping services. Many local building officials indicated to us that they ignored initial emails because they thought it was spam or a solicitation. This occurred despite indication in our initial email that FBC was providing the funding for free mapping services.
- Update all Wind Speed County Level Category I-IV Maps at the same time. This will keep map language and Figure information consistent with the most recent edition of the Florida Building Code.
- Create four statewide wind speed polygon GIS datasets from the four wind speed line GIS datasets and continue to host all wind speed GIS datasets on www.FGDL.org

Appendix A - Statewide Maps for the 8th Edition (2023) update to the Florida Building Code. Figures: 1609.3(1), 1609.3(2), 1609.3(3), and 1609.3(4), as well as the Wind-borne Debris Region Map

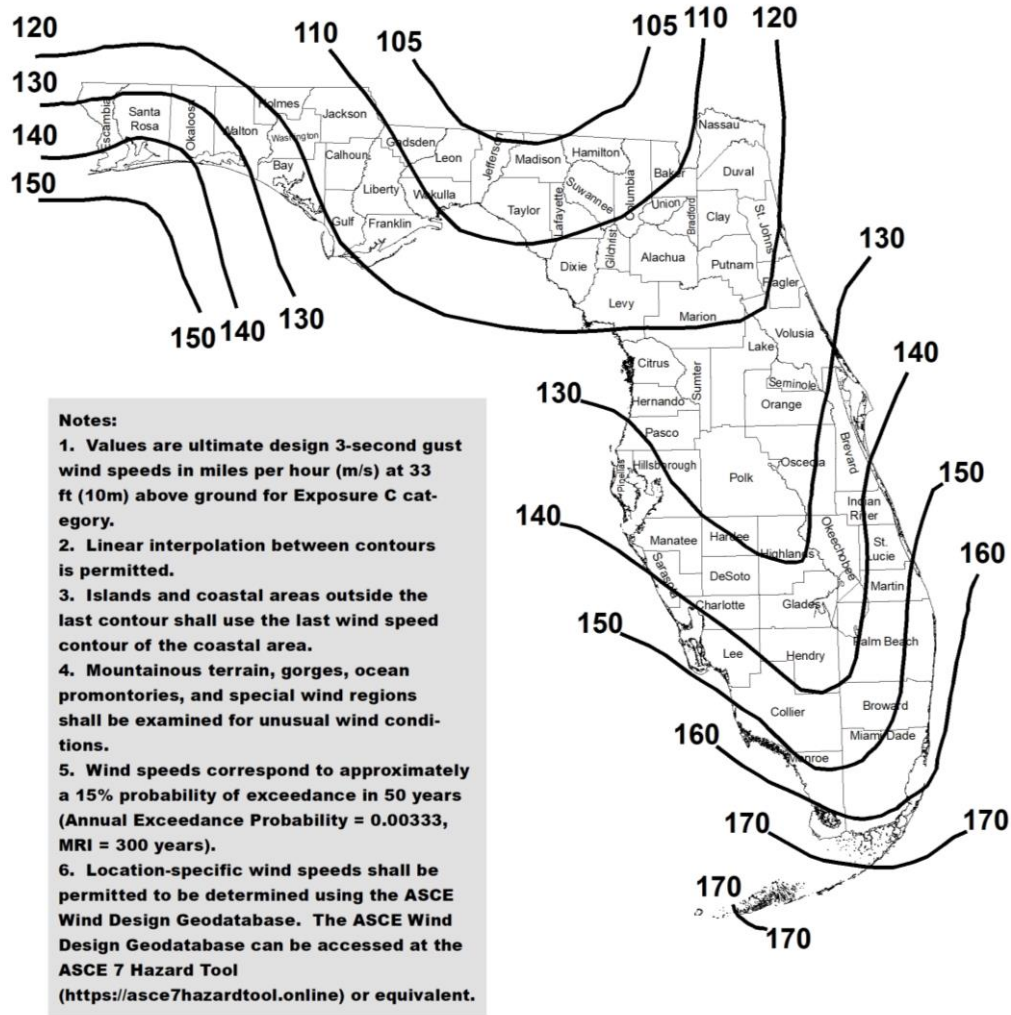


FIGURE 1609.3(4)
 ULTIMATE DESIGN WIND SPEEDS, V_{ULT} , FOR RISK CATEGORY I BUILDINGS AND OTHER STRUCTURES

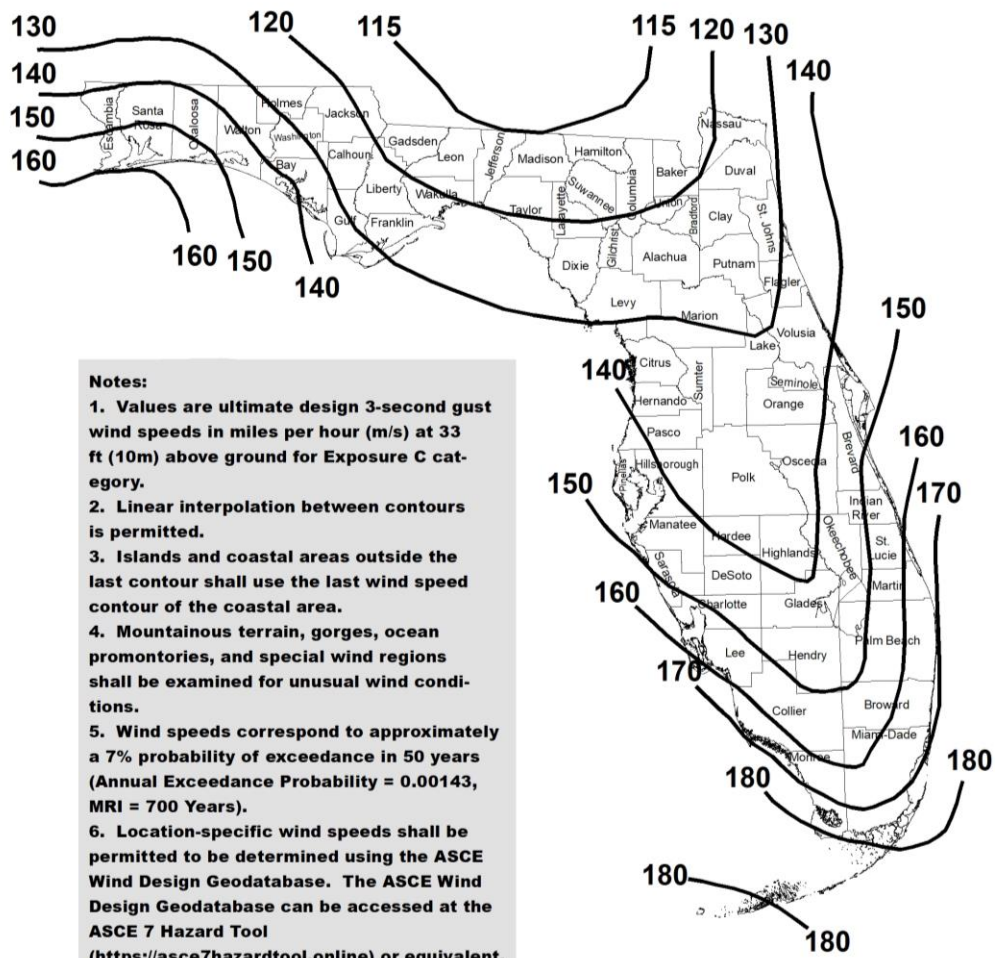
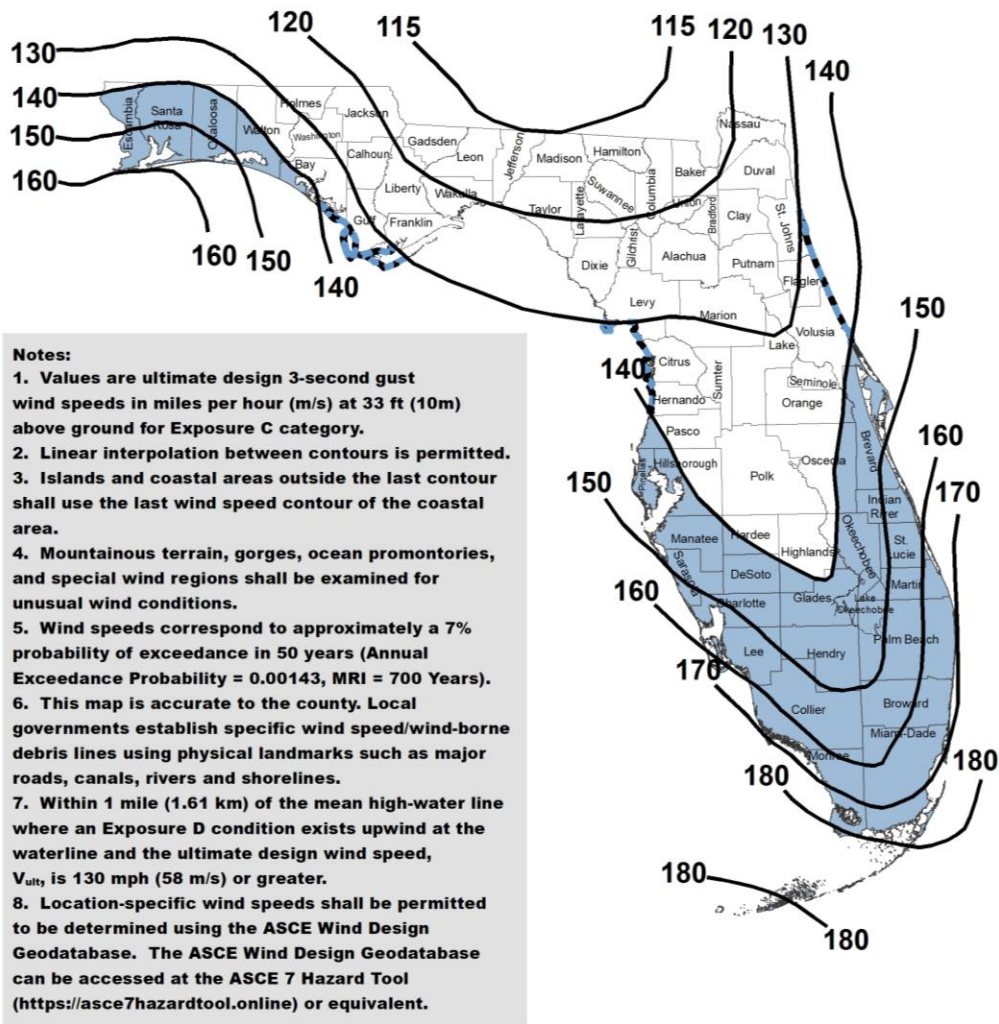


FIGURE 1609.3(1)
 ULTIMATE DESIGN WIND SPEEDS, V_{ULT} , FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES



Wind-borne Debris Region

--- 130 MPH and within 1 mile of the mean high-water line, * See Note 7.

■ Designated areas where the ultimate design wind speed, V_{ult} , is 140 mph (63.6 m/s) or greater.

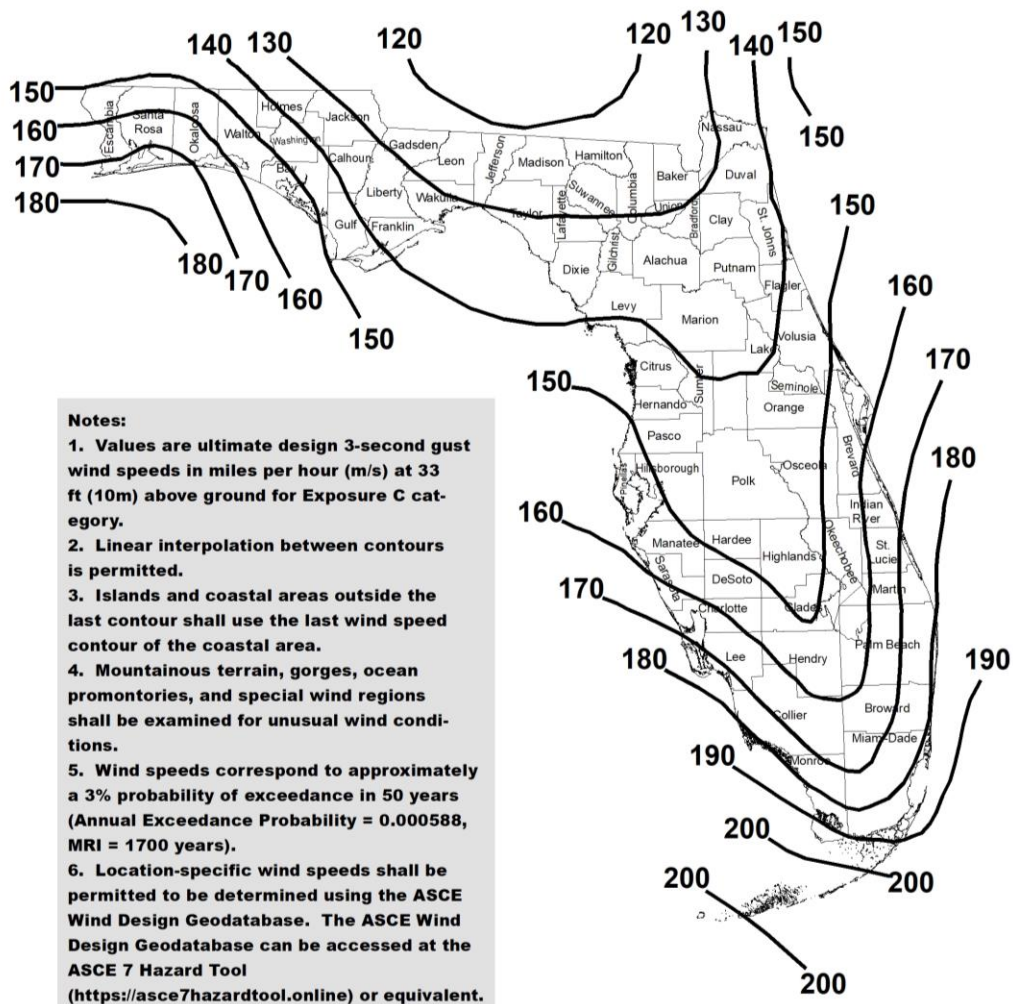


FIGURE 1609.3(2)
 ULTIMATE DESIGN WIND SPEEDS, V_{ULT} , FOR RISK CATEGORY III BUILDINGS AND OTHER STRUCTURES

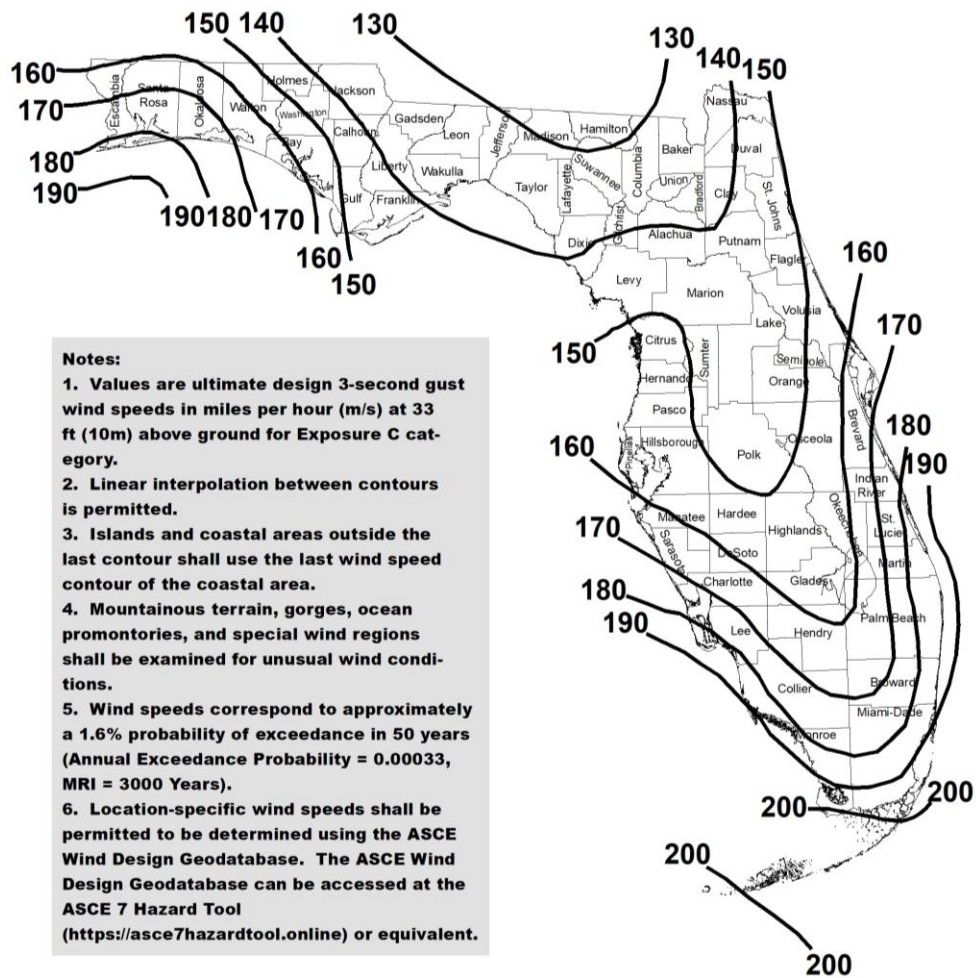
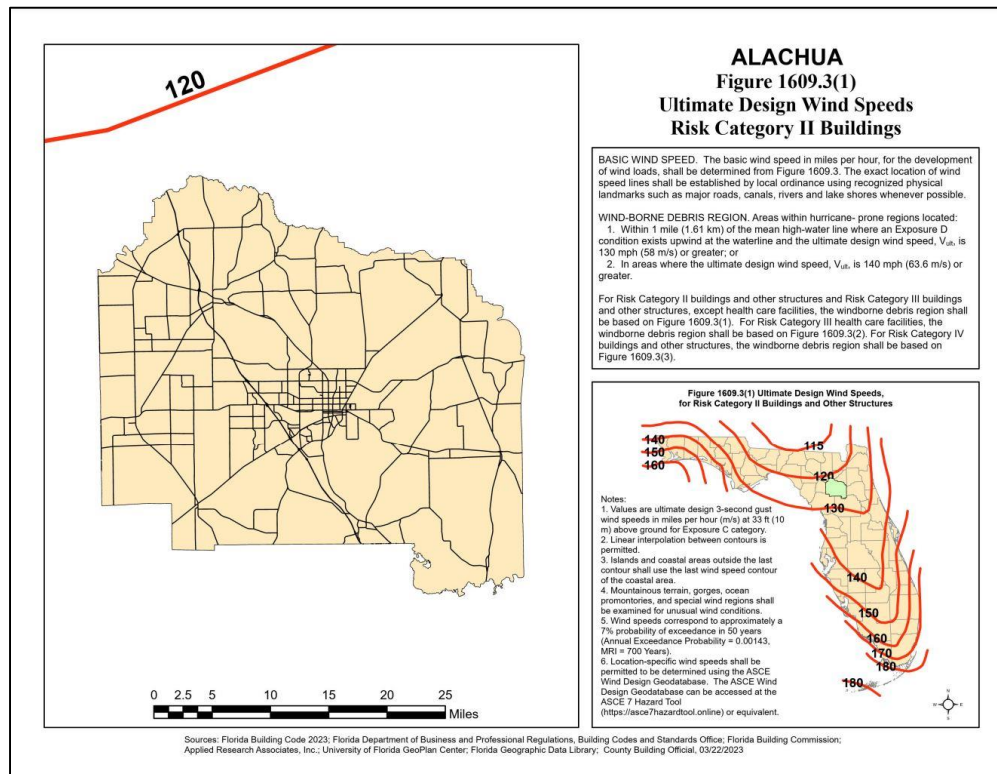
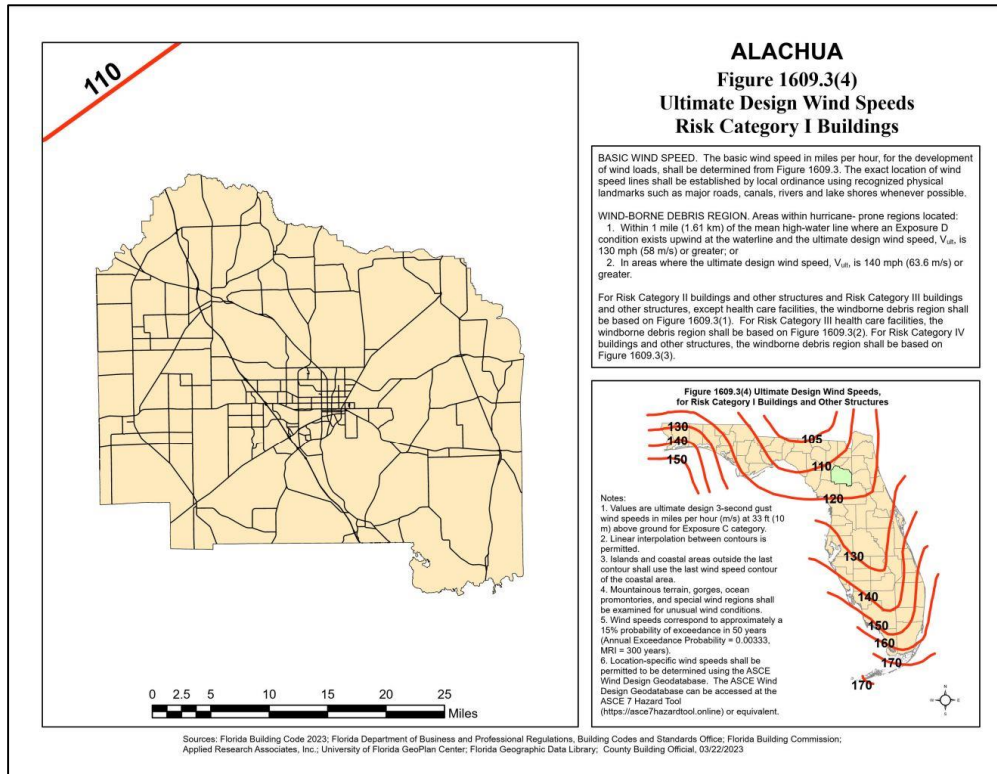
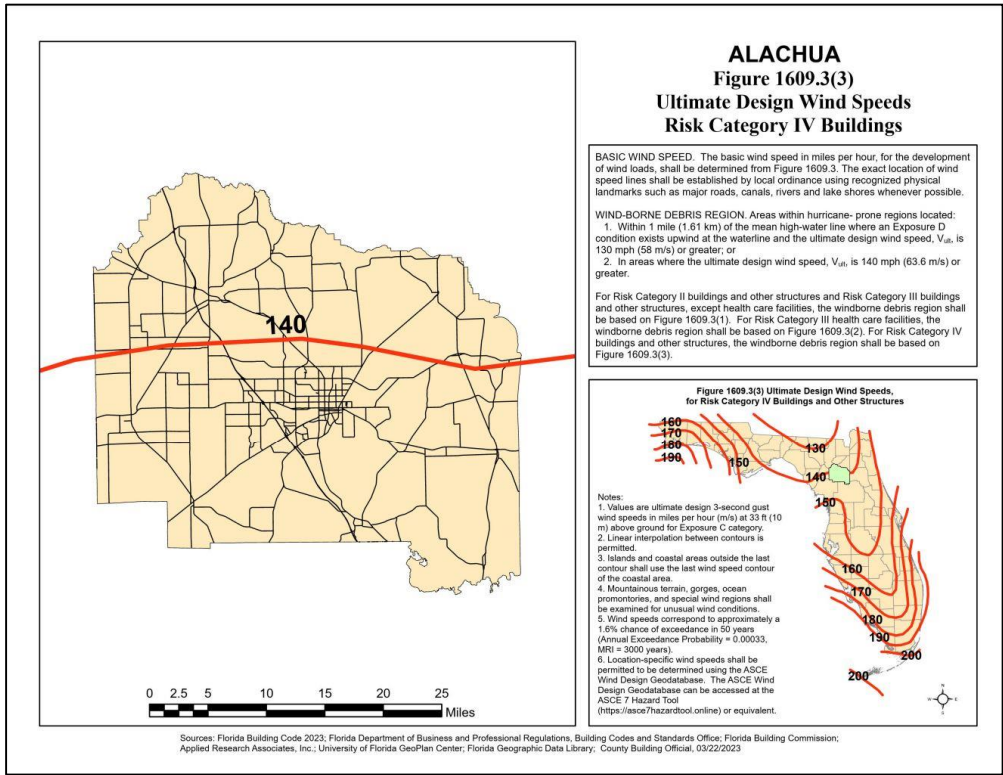
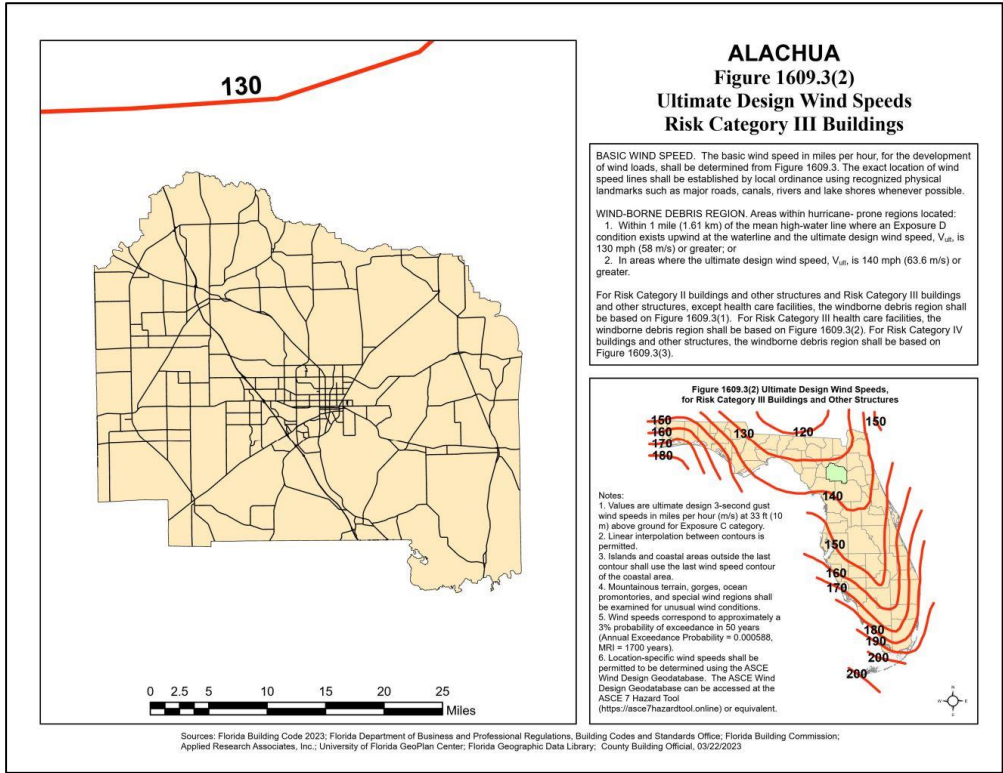


FIGURE 1609.3(3)
 ULTIMATE DESIGN WIND SPEEDS, V_{ULT} , FOR RISK CATEGORY IV BUILDINGS AND OTHER STRUCTURES

Appendix B – Alachua County Examples of the Risk Category I-IV Preliminary Countywide PDF Maps





Appendix C - Email Notification

Subject: FBC 2023: Updates to Ultimate Design Wind Speeds Maps (Risk Categories I-IV)

To All Building Officials:

The purpose of this correspondence is to call attention to significant changes to Section 1609 in the proposed 2023 update to the Florida Building Code that addresses Wind Loads. **The anticipated effective date of the 2023 Florida Building Code (FBC) is December 31st, 2023.**

The changes to the Ultimate Design Wind Speed line maps for the 8th Edition (2023) update to the Florida Building Code (FBC). Include updates to Figures: 1609.3(1), 1609.3(2), 1609.3(3) and 1609.3(4) which will be based on the standards set forth in Chapter 26 of the American Society of Civil Engineers (ASCE), the Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-22).

In order to facilitate updating your wind speed maps prior to the anticipated effective date of the 2023 Florida Building Code, The State of Florida Department of Business and Professional Regulation, Florida Building Commission, Codes and Standards Office has contracted with the University of Florida GeoPlan Center to provide you with mapping assistance and support.

The GeoPlan Center has developed an updated Web Viewer, and PDF maps for your county, for the structure Risk Categories I-IV (Figures 1609.3(1-4)) to use as a guide in determining the exact location of wind speed lines within your jurisdiction.

To find out how to obtain copies of these maps for your county and to learn more about available mapping support, please see the attached document:

- Ultimate Design Wind Speeds, Vult, For Risk Categories I-IV Buildings and Other Structures Map Viewer (2023) Manual
 - This document contains instructions on how to access and use the Ultimate Design Wind Speeds Map Viewer to compare 2020 and 2023 wind speed lines (pages 1-3), how to use the ASCE 7 Hazard Tool to look up design parameters (page 4), and how to download wind speed data (page 5).
 - **Ultimate Design Wind Speeds Web Viewer Manual 20230323.pdf**
 - https://ad hoc.geoplan.ufl.edu/downloads/kate/windspeed_2023

The exact location of wind speed lines for your county are to be established by local ordinance using recognized physical landmarks such as major roads, canals, rivers and lake-shores wherever possible. Mapping support will be provided to your county at no cost (until June 30th, 2023) to facilitate updating the wind speed maps prior to the anticipated effective date of December 31st, 2023. If your county needs GIS support to help move the wind speed lines to recognized physical landmarks, please contact Kate Norris.

Please reply by April 7th 2023 to initiate the update process for your jurisdiction's wind speed maps.

Please let us know if you will be:

1. Accepting the maps "As Is, "
2. If your county plans to move the line work in house, using County GIS support, or
3. If your county would like GeoPlan's assistance moving the line work to recognized physical landmarks.

Thank you for your time and help,
Kate Norris

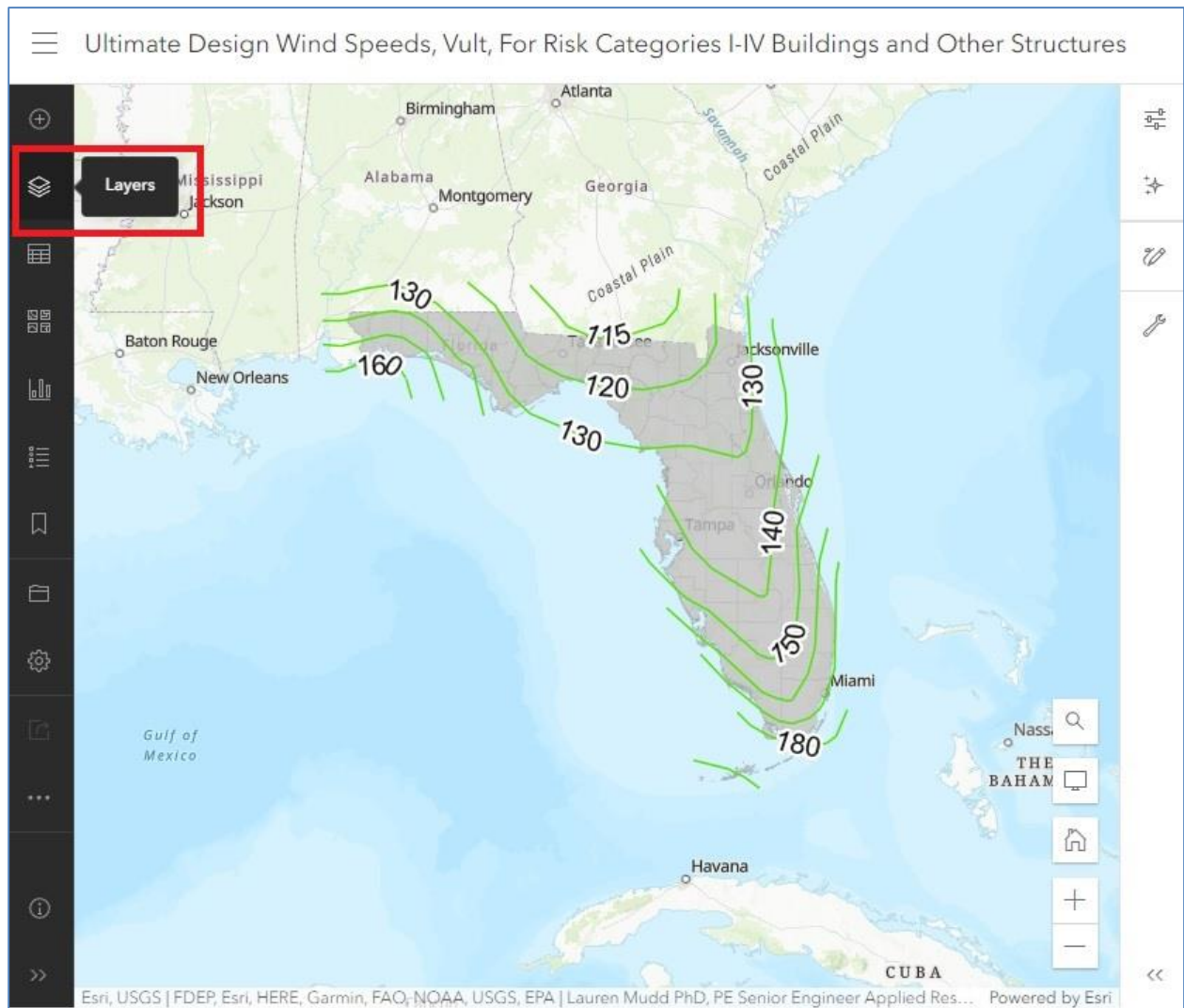
Ultimate Design Wind Speeds, Vult, For Risk Categories I-IV Buildings and Other Structures Map Viewer (2023) Manual

This document contains instructions on how to access and use the Ultimate Design Wind Speeds Map Viewer to compare 2020 and 2023 wind speed lines (pages 1-3), how to use the ASCE 7 Hazard Tool to look up design parameters (page 4), and how to download wind speed data (page 5).

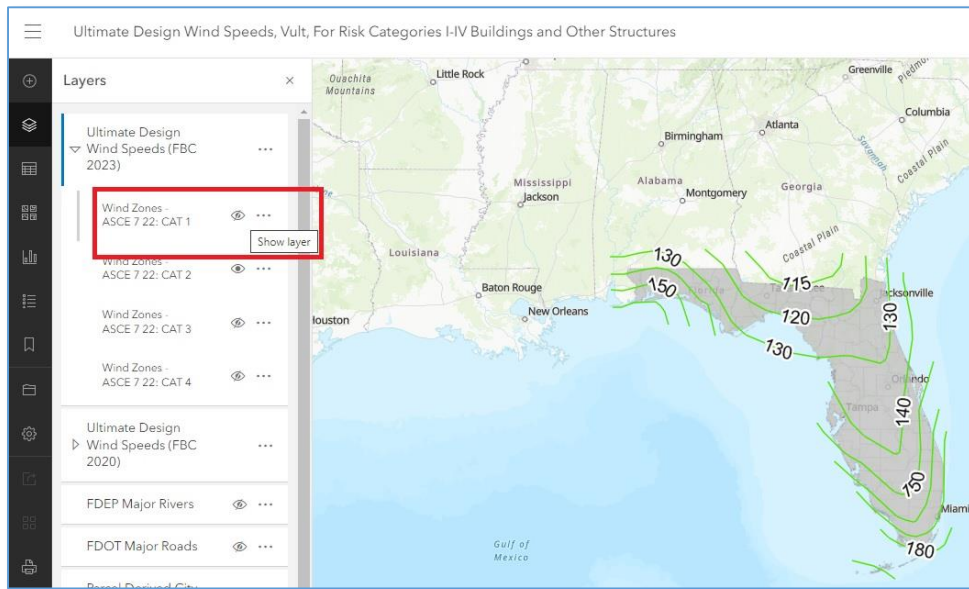
Map Viewer Link:

<https://ufl.maps.arcgis.com/apps/mapviewer/index.html?webmap=3a5d5dd7d44744eeb9537b76534a72a9>

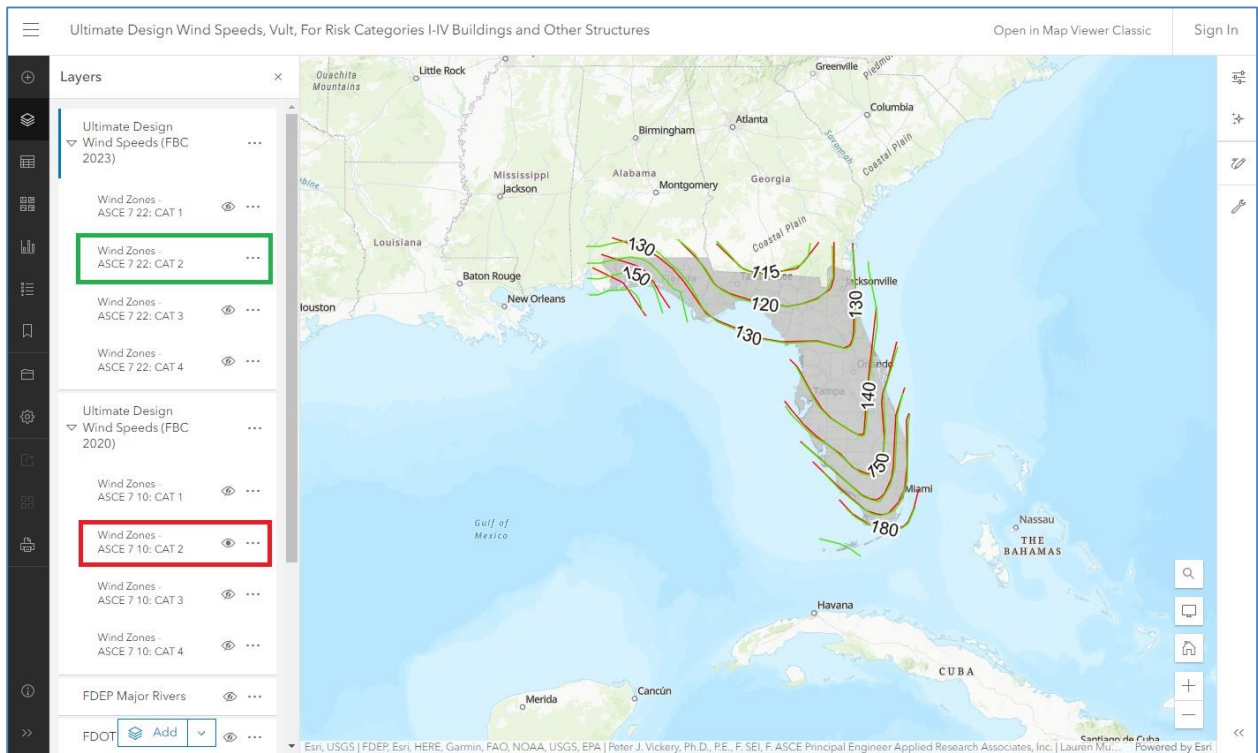
By default, the Map Viewer displays the statewide map, with the ASCE/SEI 7-22 Risk Category II Basic Wind Speed Map lines shown in green. To access the other map layers, click the Layers button on the left side of the screen.



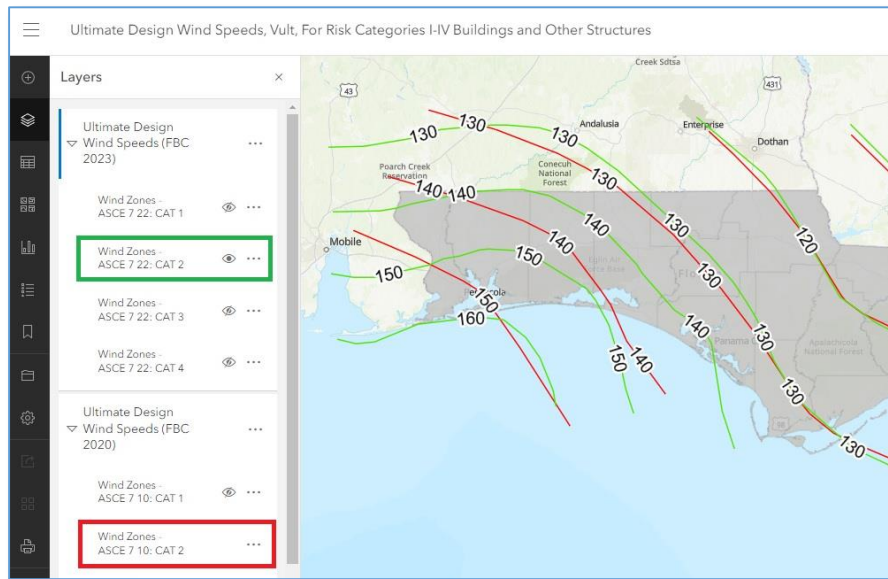
Click on “Ultimate Design Wind Speeds (FBC 2023)” to reveal all four wind speed line categories (CAT I-IV) shown in green. Turn each layer on and off using the Show Layer “eye” button.



The user can compare the changes in wind speed lines from 2020 to 2023. The 2020 wind speed line layers are available under “Ultimate Design Wind Speeds (FBC 2020)”. The image below shows the statewide comparison of the CAT II lines 2020 (red) to 2023 (green).



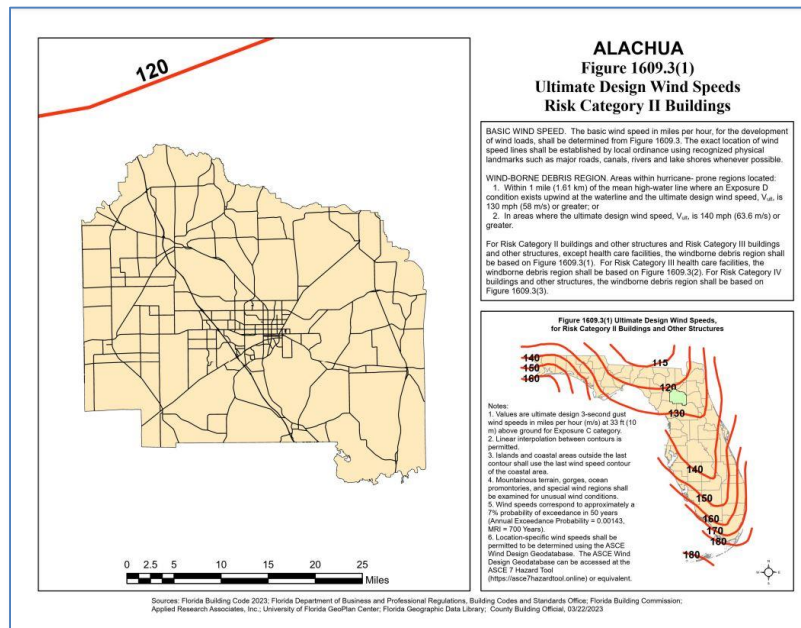
Map navigation tools are located in the lower right corner of the viewer. Zoom into an area of interest, and compare any changes in more detail.



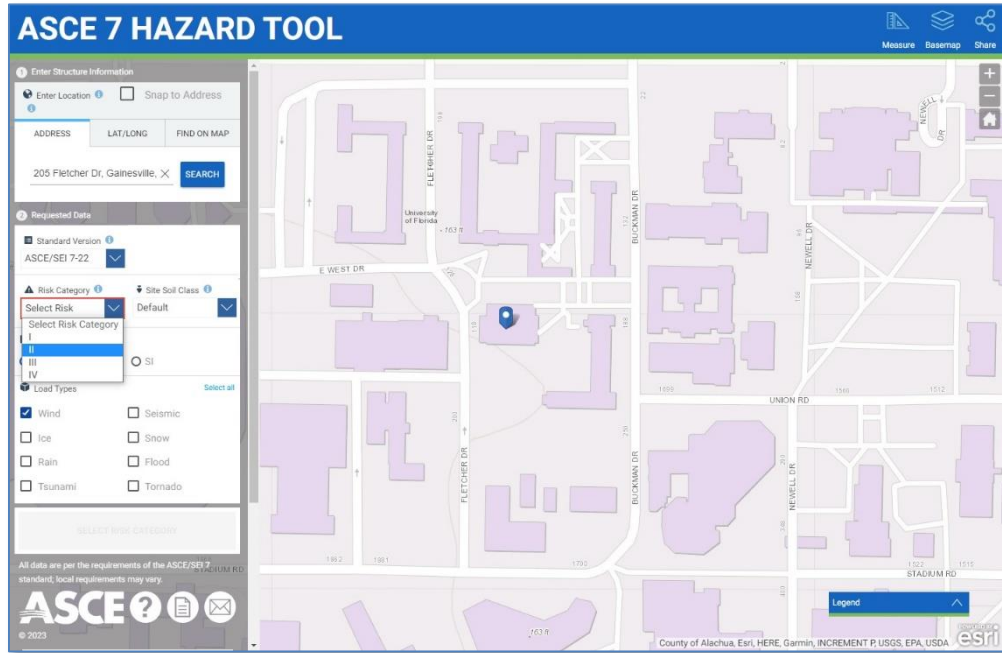
The Florida Building Code (FBC) 8th Edition (2023): FIGURES 1609.3(1-4) show in green are available for download from the Florida Geographic Data Library (www.fgdl.org). The links to these four datasets are included on Page 5 of this document.

Individual Preliminary Countywide (CAT I-IV) 2023 PDF maps are also available for download from the following location:

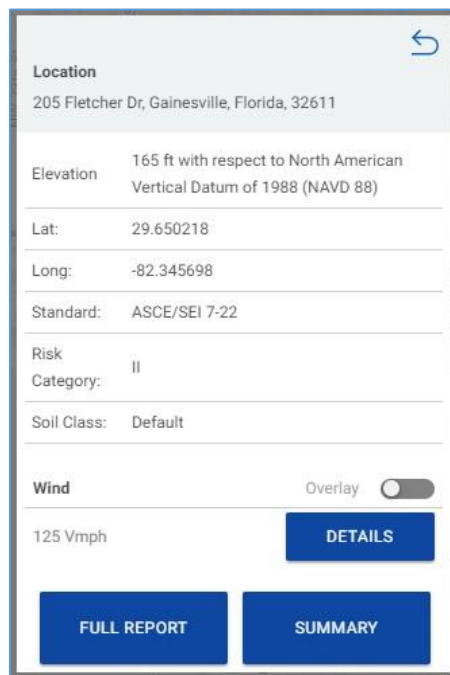
https://adhoc.geoplan.ufl.edu/downloads/kate/windspeed_2023/Preliminary_County_PDFs_Draft_20230322/



Additionally, the **ASCE 7 HAZARD TOOL** (<https://asce7hazardtool.online>) is now available. The ASCE 7 Hazard Tool, is a quick, reliable, and free way to look up key design parameters specified in Standard ASCE/SEI 7-22. Simply input a street address, select a wind speed category, click Wind, and then click View Results.



The initial report shows an interpolated wind speed number for the address. A more detailed PDF report for download can be created by clicking “Full Report”.



Ultimate Design Wind Speeds 2023 GIS Data Download Location:

ASCE/SEI 7-22 Risk Category I Basic Wind Speed Map (300yr) for Florida - 2021

FILENAME: WINDZONES_CAT1_ASCE7_22_JUN21

External Metadata:

https://fgdl.org/zips/metadata/xml/windzones_cat1_asce7_22_jun21.xml

Data Download:

https://fgdl.org/zips/geospatial_data/archive/windzones_cat1_asce7_22_jun21.zip

ASCE/SEI 7-22 Risk Category II Basic Wind Speed Map (700yr) for Florida - 2021

FILENAME: WINDZONES_CAT2_ASCE7_22_JUN21

External Metadata:

https://fgdl.org/zips/metadata/xml/windzones_cat2_asce7_22_jun21.xml

Data Download:

https://fgdl.org/zips/geospatial_data/archive/windzones_cat2_asce7_22_jun21.zip

ASCE/SEI 7-22 Risk Category III Basic Wind Speed Map (1700yr) for Florida - 2021

FILENAME: WINDZONES_CAT3_ASCE7_22_JUN21

External Metadata:

https://fgdl.org/zips/metadata/xml/windzones_cat3_asce7_22_jun21.xml

Data Download:

https://fgdl.org/zips/geospatial_data/archive/windzones_cat3_asce7_22_jun21.zip

ASCE/SEI 7-22 Risk Category IV Basic Wind Speed Map (3000yr) for Florida - 2021

FILENAME: WINDZONES_CAT4_ASCE7_22_JUN21

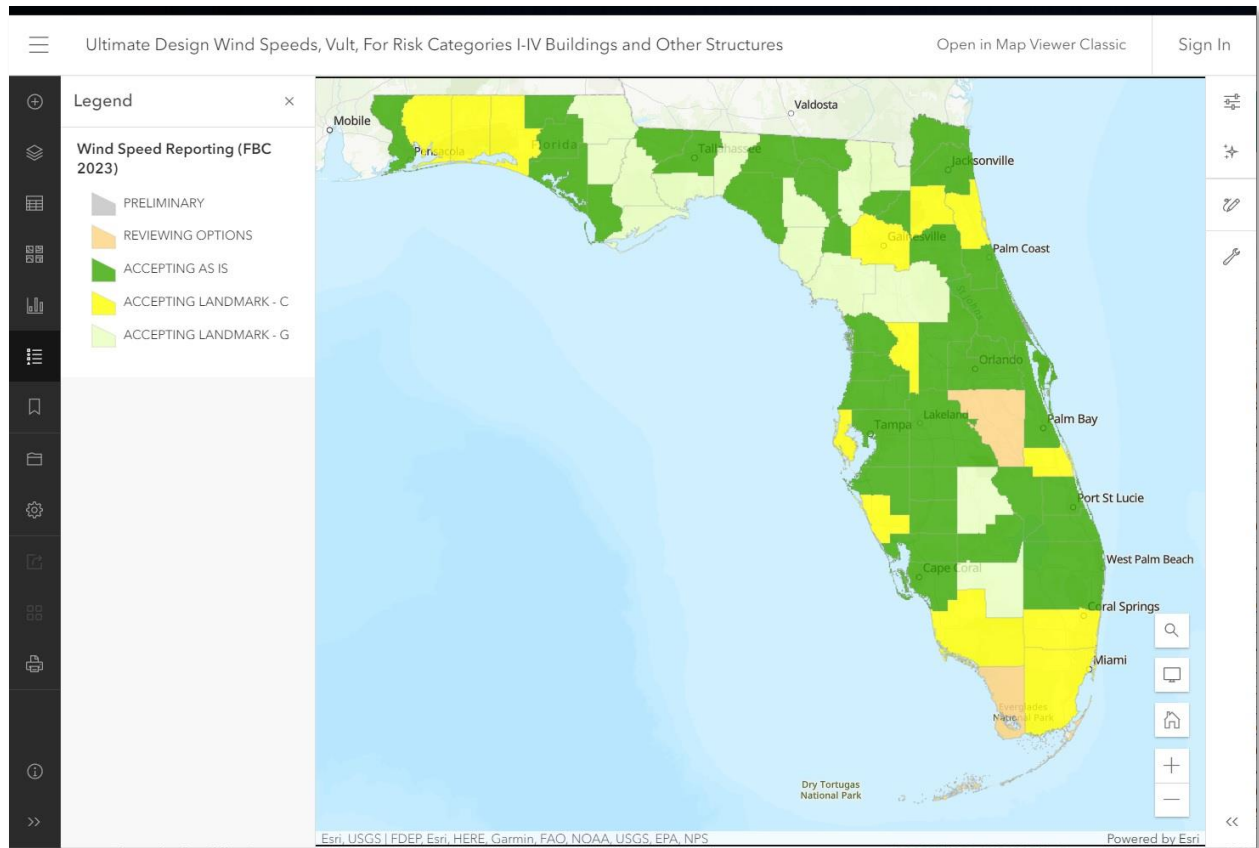
External Metadata:

https://fgdl.org/zips/metadata/xml/windzones_cat4_asce7_22_jun21.xml

Data Download:

https://fgdl.org/zips/geospatial_data/archive/windzones_cat4_asce7_22_jun21.zip

Appendix E - Ultimate Design Wind Speeds, Vult, For Risk Categories I-IV Buildings and Other Structures Web Map Viewer Progress Reporting



Source: [Ultimate Design Wind Speeds, Vult, For Risk Categories I-IV Buildings and Other Structures \(arcgis.com\)](https://arcgis.com)

Statewide Wind Speed Reporting (FBC 2023):

- 38 Counties are adopting the preliminary map “As Is”
- 14 Counties have been assisted by the GeoPlan mapping team (Landmark – G).
- 13 Counties have developed their own local landmark maps (Landmark – C).
- 2 Counties are still reviewing their mapping options.

County Name	Wind Speed Reporting (FBC 2023)	County Name	Wind Speed Reporting (FBC 2023)
Alachua	ACCEPTING LANDMARK - C	Lake	ACCEPTING AS IS
Baker	ACCEPTING LANDMARK - G	Lee	ACCEPTING AS IS
Bay	ACCEPTING AS IS	Leon	ACCEPTING AS IS
Bradford	ACCEPTING AS IS	Levy	ACCEPTING LANDMARK - G
Brevard	ACCEPTING AS IS	Liberty	ACCEPTING LANDMARK - G
Broward	ACCEPTING LANDMARK - C	Madison	ACCEPTING AS IS
Calhoun	ACCEPTING LANDMARK - G	Manatee	ACCEPTING AS IS
Charlotte	ACCEPTING AS IS	Marion	ACCEPTING LANDMARK - G
Citrus	ACCEPTING AS IS	Martin	ACCEPTING AS IS
Clay	ACCEPTING LANDMARK - C	Monroe	REVIEWING OPTIONS
Collier	ACCEPTING LANDMARK - C	Nassau	ACCEPTING AS IS
Columbia	ACCEPTING LANDMARK - G	Okaloosa	ACCEPTING LANDMARK - C
Miami-Dade	ACCEPTING LANDMARK - C	Okeechobee	ACCEPTING AS IS
Desoto	ACCEPTING AS IS	Orange	ACCEPTING AS IS
Dixie	ACCEPTING LANDMARK - G	Osceola	REVIEWING OPTIONS
Duval	ACCEPTING AS IS	Palm Beach	ACCEPTING AS IS
Escambia	ACCEPTING AS IS	Pasco	ACCEPTING AS IS
Flagler	ACCEPTING AS IS	Pinellas	ACCEPTING LANDMARK - C
Franklin	ACCEPTING LANDMARK - G	Polk	ACCEPTING AS IS
Gadsden	ACCEPTING AS IS	Putnam	ACCEPTING AS IS
Gilchrist	ACCEPTING AS IS	St. Johns	ACCEPTING LANDMARK - C
Glades	ACCEPTING AS IS	St. Lucie	ACCEPTING AS IS
Gulf	ACCEPTING AS IS	Santa Rosa	ACCEPTING LANDMARK - C
Hamilton	ACCEPTING AS IS	Sarasota	ACCEPTING LANDMARK - C
Hardee	ACCEPTING AS IS	Seminole	ACCEPTING AS IS
Hendry	ACCEPTING LANDMARK - G	Sumter	ACCEPTING LANDMARK - C
Hernando	ACCEPTING AS IS	Suwannee	ACCEPTING AS IS
Highlands	ACCEPTING LANDMARK - G	Taylor	ACCEPTING AS IS
Hillsborough	ACCEPTING AS IS	Union	ACCEPTING AS IS
Holmes	ACCEPTING AS IS	Volusia	ACCEPTING AS IS
Indian River	ACCEPTING LANDMARK - C	Wakulla	ACCEPTING LANDMARK - G
Jackson	ACCEPTING LANDMARK - G	Walton	ACCEPTING LANDMARK - C
Jefferson	ACCEPTING LANDMARK - G	Washington	ACCEPTING AS IS
Lafayette	ACCEPTING LANDMARK - G		