

# **Investigation of the Wind-borne Debris Regions in ASCE 7-22, Phase II**

Interim Report

Florida Department of Business and Professional Regulation

Florida Building Commission

and

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## Executive Summary

The Florida Building Commission initiated this study to inform potential refinements to the Wind-Borne Debris Region (WBDR) definition for consideration in future revisions of the Florida Building Code (FBC). The study seeks to determine whether inland residential areas adjacent to large open-water bodies that produce Exposure D wind conditions should be designated as WBDRs when basic design wind speeds range from 130 to 139 mph, and, if so, the inland distance over which such designation should apply. Because WBDR designation triggers enhanced building-envelope protection requirements, any modification to WBDR boundaries must be supported by technically defensible evidence demonstrating comparable WBD risk.

This investigation is being conducted by the University of Florida in collaboration with Applied Research Associates, Inc. (ARA). Phase I assessed relative WBD risk through literature review, historical storm damage data, and physics-based simulation of debris generation and impacts within representative residential neighborhoods. Initial findings indicate that debris-impact risk under Exposure D at 130–139 mph is approximately equivalent to the WBDR benchmark (140 mph in exposure B) when buildings are located within 3,000 ft from the water line in both exposure conditions. However, these findings were based on an idealized neighborhood representation and limited observational data, necessitating further analysis to support potential code decisions.

Phase II builds upon the Phase I analytical framework by incorporating improved neighborhood representation and refined modeling to provide a more robust technical basis for evaluating inland WBDR designation. The HURMIS model, a physics-based simulation model, was applied to a 1000ft-by-1000ft parcel-level representation of the residential neighborhood surrounding Lake Louisa to establish a baseline methodology for consistent application across the additional neighborhoods identified in Phase I of the project. The modeling incorporates realistic building spacing, construction characteristics, and directionally dependent terrain roughness derived from land-cover data. Simulations have been performed across multiple inland distances from the shoreline of Lake Louisa.

Building on this simulation-based approach, ongoing work will (1) expand the modeled neighborhood domain to better capture upwind debris generation, (2) apply the framework across the additional Phase I neighborhoods, and (3) broaden the parametric evaluation to include roof age (pre- and post-FBC), roof covering type (asphalt shingles versus tile), roof geometry (gable versus hip), and multi-story residential configurations. In parallel, the risk metric is being refined from debris hits on windward walls to window hits and window breaks. Window impacts more directly reflect envelope vulnerability and consequential damage from WBD, rather than debris exposure alone, and therefore supports more risk-relevant comparisons across neighborhood layouts and building sizes. Full modeling results will be presented in the final report.

Review of available post-storm aerial and satellite imagery revealed that direct observational quantification of wind-borne debris behavior in inland lake-adjacent communities remains limited due to constraints in image availability, image resolution, capture angle or orientation, complex background surfaces, and timing of post-storm documentation. As a result, numerical simulation remains the primary analytical tool for evaluating the relative debris risk at this stage of the study.

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## 1 Introduction and Background

In 2024, the Florida Building Commission initiated an evaluation to support potential refinements to the definition of WBDR for adoption in the 2026 FBC. The guiding question is whether inland regions adjacent to large lakes that produce Exposure D wind conditions should be designated as WBDR when basic design wind speeds are between 130 and 139 mph and, if so, the inland distance from the shoreline over which such designation should apply. Because WBDR designation triggers enhanced building envelope protection requirements, including impact-resistant glazing or protective systems for exterior openings, any modification to WBDR boundaries must be supported by technically defensible evidence demonstrating that WBD risk in inland Exposure D regions is comparable to the established statewide WBDR threshold defined by the American Society of Civil Engineers (ASCE) (ASCE, 2022).

In response to this regulatory need, a team from the University of Florida (UF) and Applied Research Associates, Inc. (ARA) conducted a multi-phase study to evaluate wind-borne debris risk in inland regions adjacent to large water bodies subject to Exposure D conditions and design wind speeds between 130 and 139 mph. Phase I evaluated relative WBD risk through a combination of literature review, historical storm damage assessments, and numerical simulation of debris impacts within representative residential neighborhoods. Results from this initial phase indicated that residential structures located near large inland water bodies under Exposure D conditions may experience WBD risk comparable to that associated with the established WBDR threshold of 140-mph design wind speed under Exposure B conditions. Simulation comparisons suggested that this equivalency occurs when homes are located within approximately 3,000 ft of the shoreline, providing a preliminary basis for considering inland WBDR designation and setback distance.

However, several limitations in the Phase I analysis require further investigation. Observational evidence of inland wind-borne debris damage following design-level storm events remains limited, and the initial simulation framework relied on a single prototype neighborhood consisting of uniformly single-story residential structures with one roof type. These constraints introduce uncertainty regarding the robustness and broader applicability of the preliminary 3,000-ft equivalency finding and highlight the need for a stronger technical basis to support potential FBC decisions.

In response, the Florida Building Commission initiated Phase II of this research to resolve the remaining technical uncertainties and provide a more defensible basis for evaluating inland WBDR designation. The objective of Phase II is to provide a more robust analysis to determine whether inland Exposure D conditions produce WBD risk equivalent to that associated with the established 140-mph WBDR threshold defined in ASCE 7-22 and to inform potential decisions regarding inland WBDR designation and appropriate setback distances from large inland water bodies. To achieve this objective, Phase II work was structured into the tasks and deliverables described below.

- **Task 1: Data Collection and Analysis**  
The objective of Task 1 is to collect data from published, post-storm imagery to assess the generation and transportation of WBD relative to wind field and upwind terrain conditions for storm events with overland wind speeds between 130 and 140 mph.

- **Task 2: Damage Assessment**  
The objective of Task 2 is to assess WBD generation and resulting damage in neighborhoods adjacent to Exposure D conditions following a hurricane and to document the distances from the waterline over which debris damage is observed.
- **Task 3: WBD modelling**  
The objective of Task 3 is to refine the stochastic WBD model developed in the first phase of this research to account for variation in neighborhood makeup and to validate simulation results with debris damage observations.

## **2 Task 1: Data Collection and Analysis**

Despite the large number of documented hurricane events in Florida available from major repositories, including the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the Federal Emergency Management Agency (FEMA), and the NHERI DesignSafe database—several limitations constrained detailed analysis and comprehensive data synthesis. These limitations primarily relate to the suitability of available imagery for identifying and tracking WBD at the building scale.

Key constraints in aerial imagery include:

- Image resolution, typically 15–30 cm ground sampling distance at zoom levels 19–20 (where only local highways and crossings details, and medium-sized buildings can be seen), is too low to reliably detect most WBD, limiting observations to larger objects ( $\approx 1\text{--}3$  m).
- In urban environments, complex background surfaces such as pavement and vegetation reduce image contrast, while trees and other vegetation can physically obscure debris, making windborne debris difficult or impossible to distinguish from surrounding surfaces in aerial imagery
- Aerial images mostly show roofs and horizontal surfaces, while walls, windows, and areas under overhangs are hidden, making it difficult to see debris or resulting damage on buildings or areas beneath overhangs.
- Some images are restricted by maximum zoom levels set by original sensor resolution, reducing access to fine spatial detail.
- Discontinuity and temporal gaps in available imagery, hindering the ability to establish a continuous sequence linking debris generation, transport, and resulting damage.

Prior studies incorporating machine learning and aerial imagery for debris assessment indicate that such imagery is generally more reliable for identifying debris zones or accumulation areas than for detecting and tracking individual debris objects, particularly smaller items at the building scale (Jiang and Friedland, 2016; Womble et al., 2008; Cheng et al., 2024). Limitations related to spatial resolution, roof-dominant viewing angles, background complexity, and temporal gaps between image captures further constrain the ability to establish direct source-to-impact relationships linking debris generation, transport, and façade-level damage (Ghaffarian & Kerle, 2019; Winans et al., 2023).

Key constraints in street view images include the following:

- Street-level, post-storm imagery predominantly documents the street-facing elevations; consequently, damage on side and rear façades, where wind-borne debris impacts may also occur, are frequently unobserved.
- Visual occlusions from vegetation, parked vehicles, fencing, and other streetscape elements routinely obscure openings and potential debris sources, making it difficult to track WBD damage.
- Image acquisition is restricted to roads that remain accessible following the event, resulting in uneven spatial coverage and the potential omission of critical WBD indicators in inaccessible blocks, dead-end streets, and interior parcels.

Some of these limitations are also acknowledged in prior research. For example, Zhai and Peng (2020) used Google Street View (GSV) imagery to assess damage from Hurricane Michael in Mexico Beach, Florida, following the 2018 landfall. They note that imagery is only available where Street View coverage exists and where roads remain accessible after an event, which can produce uneven spatial coverage and lead to omission of damage in areas that cannot be reached.

Other limitations encountered in our study include rapid post-landfall debris removal and cleanup operations, which often eliminated physical evidence of windborne debris before ground-based documentation could be collected. In addition, available post-storm imagery was not taken with the intent to capture windborne debris; therefore, details needed for windborne debris identification or tracking were inadequately captured.

Collectively, these limitations restrict the extent to which available post-storm imagery alone can be used to quantify WBD generation and transport and highlight the need for complementary approaches.

### **3 Task 2: Field Damage Assessment**

This task could not be performed because no hurricanes made landfall in Florida during the 2025 calendar year, resulting in the absence of relevant storm-event data for analysis.

### **4 Task 3: Debris Modeling**

The Hurricane Missile (HURMis) model used for WBD simulation in Phase I was refined in Phase II to improve representation of actual residential neighborhoods and to support more realistic assessment of debris generation, transport, and impact under inland Exposure D conditions. The underlying modeling framework remains consistent with the validated Phase I methodology, in which debris trajectories and impacts are simulated using directionally dependent surface roughness, hurricane wind-field characteristics, and component-level failure modeling for typical residential construction.

Unlike the Phase I simulations, which employed an idealized and arbitrarily generated neighborhood configuration, Phase II incorporates parcel-level neighborhood geometry and representative building spacing derived from an actual residential community. This refinement enables improved representation of building layout, orientation, and spacing effects on debris generation and transport within the modeled domain.

For the current stage of the project, a 1,000 ft × 1,000 ft model domain of the Lake Louisa neighborhood—one of the 30 inland neighborhoods identified in Phase I—has been fully developed and implemented within the simulation framework. The modeled configuration includes representative residential construction characteristics. Simulations incorporate hurricane wind fields with associated turbulence characteristics and track debris generation, transport, and impact frequencies across the modeled neighborhood under defined exposure conditions.

Consistent with the Phase I analytical framework, debris impact results were normalized against a benchmark Exposure B scenario at 140 mph, producing “relative hit” metrics that quantify WBD risk on a consistent basis across locations; however, an appropriate normalization benchmark for comparison with detailed neighborhood simulations is under investigation. Detailed description of the HURMis modeling framework is described in Phase 1 report.

#### ***4.1 Data Sources for Neighborhood Imagery and Housing Analysis***

To obtain aerial imagery and housing characteristics for neighborhoods selected for the WBD simulations, multiple authoritative and complementary data sources were integrated. A GIS-based database developed by Dr. David Roueche (Auburn University) was used to obtain aerial imagery and parcel-level information for the selected neighborhood. This database provides statewide coverage across Florida, including building footprints, geometry, and year of construction.

To capture variability in residential construction practices and housing characteristics for input into the HURMis WBD modeling framework, additional datasets were incorporated. Property-level information, including building type, year of construction, number of stories, and primary roofing material—was obtained from Realtor.com (n.d.) and county property appraiser information (Lake County Property Appraiser, n.d.). Roof age information was obtained from Fast Track Services (Orange County Government, 2025), derived from roof-related permit records, enabling differentiation between FBC and pre-FBC roofing within the selected neighborhood. Google Earth (Google, 2024) was used to examine plan-view roof geometries and to classify roof shapes for individual structures. Figure 1 shows the aerial imagery of Lake Louisa neighborhood obtained from the database.

Collectively, these datasets enabled development of a neighborhood-specific, parcel-level inventory of residential building characteristics. This integrated approach ensures that the WBD simulations incorporate realistic spatial variability in housing stock, construction era, and roof system attributes, thereby improving the fidelity and representativeness of the modeled debris impacts.

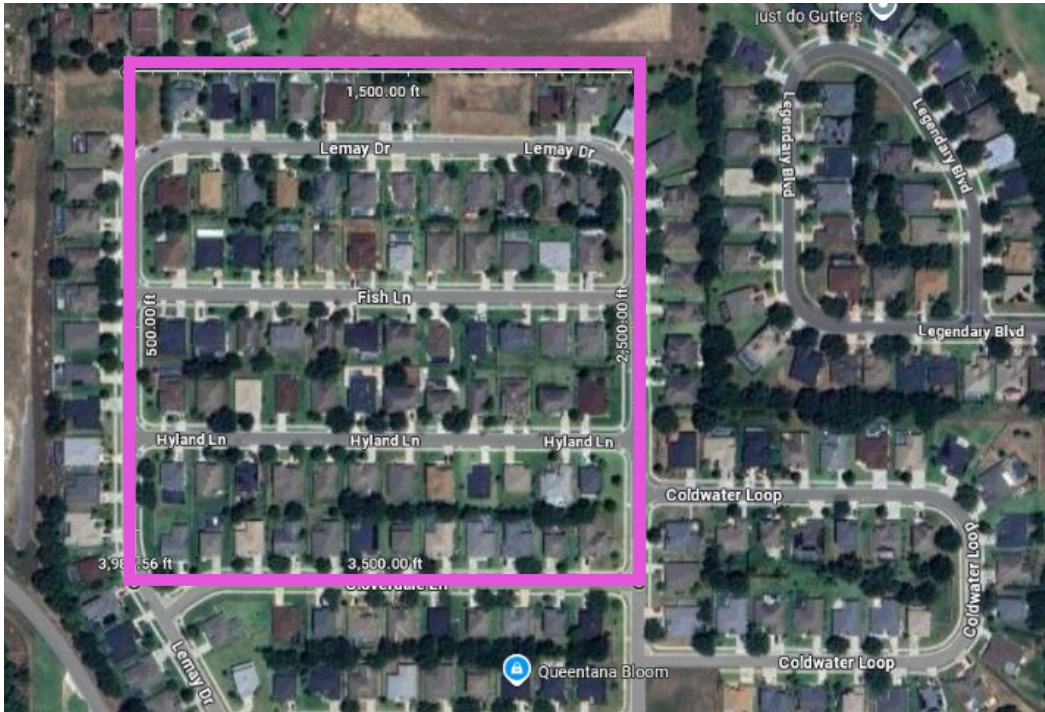


Figure 1 - Aerial imagery of post-FBC neighborhood adjacent lake Louisa. The pink square indicates the neighborhood boundary.

#### 4.2 *Directional Surface Roughness ( $Z_0$ ) Characterization – Unchanged from Phase I*

The  $Z_0$  estimation procedure established in Phase I was retained for Phase II. In both phases, directional mean  $Z_0$  values were computed in  $10^\circ$  wind-direction bins to capture the directionally varying terrain roughness effects on the local wind field.  $Z_0$  was derived from land use/land cover classifications using the Phase I approach;  $Z_0$  values were assigned by land-cover category based on Multi-Resolution Land Characteristics (MRLC) Land Cover Database and directionally averaged over an upwind fetch region (1,500 ft by 300 ft) extending from each origin point.

To evaluate how upwind terrain characteristics change with distance from open water, origin points were analyzed at multiple inland offsets from the lake shoreline. Following the Phase I approach, Phase II (Lake Louisa pilot neighborhood) computed directional mean ( $Z_0$ ) values at inland offsets of 0–5,000 ft in 1,000-ft increments. For each offset, the minimum directional  $Z_0$  was selected to represent the controlling (worst-case) upwind terrain condition governing debris generation. The  $Z_0$  values used in the Lake Louisa simulations are summarized in Table 1 and were implemented in HURMIS to represent directionally dependent terrain roughness when computing means debris impact metrics across the modeled neighborhood.

Table 1 - Directional surface roughness values ( $Z_0$ ) for Lake Louisa.

Origin Offset Distance (ft)	$Z_0$ value
0	0.037
1,000	0.108
2,000	0.194
3,000	0.243
4,000	0.332
5,000	0.373

### 4.3 Numerical Simulation of Windborne debris

Phase II extends the simulation methodology developed and validated in Phase I by transitioning from an idealized neighborhood layout to a parcel-level representation of an actual inland residential neighborhood. This upgrade improves geographic and physical realism by incorporating observed neighborhood geometry and building construction characteristics, enabling more defensible evaluation of WBD generation, transport, and impacts within inland Exposure D environments.

Consistent with Phase I, the HURMis framework models debris as discrete missiles released from failed building components (roof sheathing, roof cover, and framing) and tracks their trajectories through a prescribed hurricane wind field. Structures within the defined neighborhood boundary serve as both debris' sources and potential impact targets.

### 4.4 Pilot Neighborhood: Lake Louisa

Table 2 summarizes the Lake Louisa neighborhood geometry, building characteristics, and construction attributes as implemented in the HURMis model for this report. The corresponding modeled neighborhood layout is shown in Figure 3.

Table 2 - Neighborhood Characteristics.

Model attribute	Specification
Modeled area	1,000 ft × 1,000 ft
Residential structures	81 single-story houses: 79 hip roofs; 2 gable roofs
Building footprint (each house)	60 ft × 30 ft
House spacing (center-to-center)	70 ft (x-direction); 120 ft or 170 ft (y-direction)
Orientation	All houses oriented so the primary façade faces the nearest street
Roof covering	Average-quality FBC asphalt shingles
Roof sheathing	Plywood sheathing
Sheathing attachment	8d common nails
Windows	27 windows per house (non-impact-resistant glazing); double-hung windows counted as two units (upper/lower sashes). See Figure 2
Exterior doors	Two non-engineered exterior doors per house
Garage door	One non-engineered garage door per house

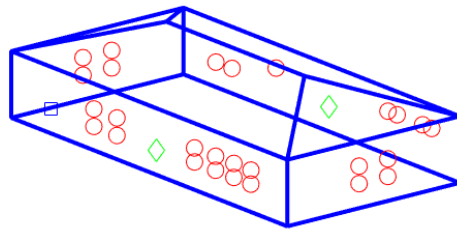


Figure 2 - Window configuration in the HURMis model (windows indicated by red circles).

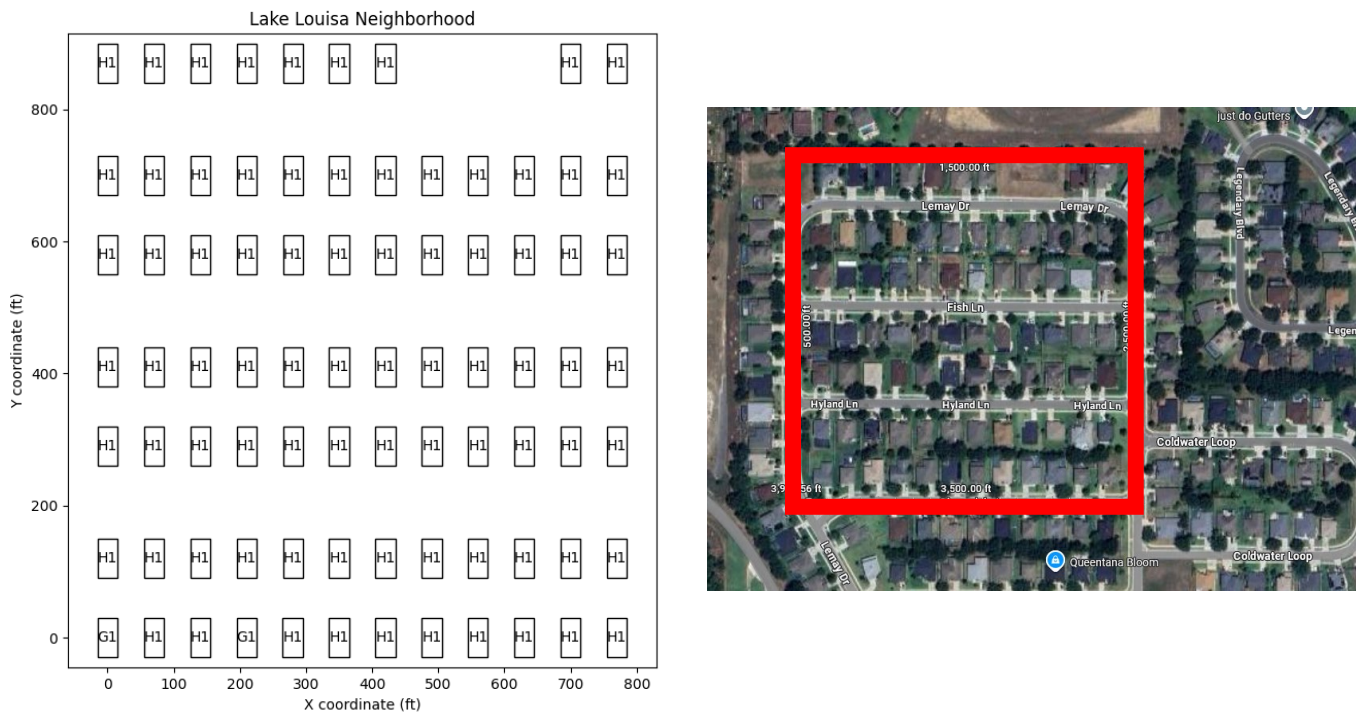


Figure 3 - Modeled neighborhoods on the left and actual neighborhood on the right.

#### 4.5 Simulation Cases and Neighborhood Definition

##### 4.5.1 Neighborhood Simulation Cases

To enable a risk-consistent comparison between WBD risk associated with Exposure D conditions—defined by the presence of a large upwind water body with a minimum fetch length of 5,000 ft—and the standard ASCE 7-22 WBDR definition, which applies to regions with design wind speeds of 140 mph or greater, a subject and a reference neighborhood were defined for the numerical simulations. The subject–reference framework was adopted to isolate the effects of exposure classification on WBD risk while holding neighborhood geometry and construction characteristics constant.

The subject neighborhood represents the Lake Louisa residential community and was evaluated under a 130-mph and 139-mph hurricane wind field corresponding to an Exposure D condition, as

defined in ASCE 7-22. This scenario reflects the design wind speed range applicable to inland residential regions adjacent to large bodies of open water.

The reference neighborhood consists of the same Lake Louisa neighborhood geometry and building characteristics, subjected instead to a 140-mph hurricane wind field under Exposure B conditions. Exposure B was chosen to account for the minimum WBD risk. It should be noted that the characteristics of the reference neighborhood most appropriate for consistent normalization are still under consideration at this stage of the study.

By expressing results in terms of relative mean debris hit for each fetch length from 0 to 5,000 ft, in 1,000-ft increments for the entire neighborhood, this approach allows identification of inland Exposure D distance where WBD risk approaches or exceeds that associated with the established Exposure B, 140-mph WBDR benchmark.

#### 4.5.2 *Simulation Cases*

WBD simulations under straight-line wind conditions were conducted for Lake Louisa. Simulations were performed for reference wind speeds of 130 mph and 140 mph. The reference wind speed for the simulations is a peak gust wind speed at 33 ft in open terrain exposure. For each location, the minimum directional  $Z_0$ , as described in section 4.2 and consistent with Phase I approach, were used to define the terrain for the origin point and the five offset distances.

Simulations were carried out for three relative orientations of the modeled neighborhood with respect to the direction of minimum  $Z_0$ :  $0^\circ$ ,  $215^\circ$ , and  $270^\circ$ . These orientations correspond to wind directions that are approximately parallel to the roof ridge, quartering to the ridge, and perpendicular to the ridge, respectively. For example, if the minimum directional  $Z_0$  occurs at  $10^\circ$  clockwise from true North, the neighborhood model is oriented as follows:

- In the first case, the long axis of the houses is aligned parallel to the  $10^\circ$  direction.
- In the second case, the long axis is rotated  $215^\circ$  relative to the  $10^\circ$  direction.
- In the third case, the long axis rotates  $270$  relative to the  $10^\circ$  direction.

For each offset position and wind direction, 10 simulation runs were performed. From these simulations, the mean number of wall impacts was computed for each house and then averaged over 81 houses (number of houses in the 1,000 ft-by-1,000 ft Lake Louisa neighborhood) to determine the mean wall impacts for the entire neighborhood.

Table 3 - Debris impact simulation cases.

<b>Straight Line Reference Wind Speed</b>	<b>Surface Roughness</b>	<b>Relative Wind Directions</b>	<b>Distances from Origin (ft)</b>
130 mph	Varying: minimum average directional $Z_0$	0°, 215°, 270°	0, 1000, 2000, 3000, 4000, 5000
139 mph	Varying: minimum average directional $Z_0$	0°, 215°, 270°	0, 1000, 2000, 3000, 4000, 5000
140 mph	Exp. B ( $Z_0 = 0.35$ m)	0°, 215°, 270°	N/A

#### 4.6 Ongoing Modelling Efforts

At this stage, preliminary simulation results are being used to refine and strengthen the Phase II modeling and analysis procedures. Current efforts focus on expanding both the geographic and structural representativeness of the simulations and the size of neighborhood evaluated. Key refinements under consideration include extending the modeled neighborhood area to better capture upwind debris generation effects and applying the framework across the additional neighborhoods identified in Phase I. Parametric analyses are also being developed to quantify sensitivity to key building and roof characteristics, including roof age (pre- and post-FBC), roof covering type (asphalt shingles versus tile), roof geometry (gable versus hip), and the inclusion of multi-story residential structures.

A major methodological improvement is also underway in the definition of the WBD risk metric. In Phase I, WBD risk was evaluated using debris impacts on windward wall façades, an approach that primarily reflects hazard exposure of building rather than impacts to the critical vulnerabilities (i.e., windows) under investigation. To better align the assessment with risk-relevant consequences, the current approach is transitioning to estimating impacts on windows using a relative “hits-on-windows” formulation, which more directly represents window vulnerability to debris impact, the primary envelope component targeted for protection in WBDR provisions. Also, the debris impact energy (or momentum) will be considered to better capture which impacts are severe enough to cause window breakage. In addition, approaches to establishing a WBD risk reference for evaluating relative risk in the evaluated neighborhoods are being explored. The refined procedures and corresponding results will be documented in the final report.

## 5 Conclusion

This Phase II investigation advances the evaluation of whether inland water bodies that produce Exposure D conditions (as defined in ASCE 7-22; ASCE, 2022) should be included within WBDR, and what shoreline setback distance would be appropriate. This assessment involved post-storm imagery review and physics-based WBD simulations applied to a realistic inland residential neighborhood under Exposure D conditions. Building upon the validated framework developed in Phase I, this phase incorporated parcel-level geometry, representative building spacing, and

construction-specific attributes, including Pre-FBC and FBC shingles and tile systems, using the Lake Louisa neighborhood as a pilot study.

Review of post-storm imagery and available datasets revealed significant limitations, including low spatial resolution, façade-level visibility constraints, and temporal discontinuities that hinder reliable tracking of debris generation and transport. While prior research has applied machine learning techniques to detect debris fields in aerial imagery, these methods generally identify debris accumulation and scattered debris paths rather than trace source-to-impact relationships (Jiang and Friedland, 2016; Womble et al., 2008; Cheng et al., 2024). Additionally, the absence of hurricane landfalls during the 2025 season precluded field validation. As a result, the HURMis simulation model remained the primary analytical tool for assessing the relative debris risk under inland Exposure D conditions compared to the established 140-mph baseline exposure B category.

The HURMis model simulation adopted the Phase I subject–reference framework, isolating exposure effects while maintaining consistent neighborhood geometry and construction characteristics. Simulations evaluated debris impact across incremental fetch distances (0–5,000 ft in increment of 1,000ft), directional surface roughness conditions, and multiple wind orientations (0°, 215°, 270°). Mean wall hits on windward façade of houses in the subject neighborhood with exposure D and a 130-139 mph basic windspeed condition were normalized against a reference 140 mph Exposure B scenario to enable consistent, risk-informed comparison. Current simulations have been completed for the Lake Louisa neighborhood using FBC-compliant shingles, with additional comparisons incorporating pre-FBC shingles and tile roofing to capture material variability. Expanded analyses, including additional neighborhood configurations and refinements to building typologies, will be presented in the final report.

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## 7 Appendix A: Inland WBDR Neighborhood

The following tables represent the neighborhoods housing characteristics of Lake Louisa used for this preliminary analysis.

### 7.1 Lake Louisa neighborhood

Address	Year	Stories	Dimensions	Roof Material	Roof type	Roof Age	Facing
10925 Lemay Dr, Clermont, FL 34711	2006	1	50 x 40	Asphalt Shingle	Hip	2006	S
10931 Lemay Dr, Clermont, FL 34711	2007	1	50 x 70	Asphalt Shingle	Hip	2007	S
10937 Lemay Dr, Clermont, FL 34711	2008	1	50 x 70	Asphalt Shingle	Hip	2008	S
10943 Lemay Dr, Clermont, FL 34711	2008	1	50 x 70	Asphalt Shingle	Hip	2008	S
10949 Lemay Dr, Clermont, FL 34711	2008	1	50 x 70	Asphalt Shingle	Hip	2008	S
10955 Lemay Dr, Clermont, FL 34711	2007	1	60 x 50	Asphalt Shingle	Hip	2007	S
11001 Lemay Dr, Clermont, FL 34711	2006	1	55 x 60	Asphalt Shingle	Hip	2006	S
11001 Lemay Dr, Clermont, FL 34711	2007	1	50 x 50	Asphalt Shingle	Hip	2007	S
11029 Lemay Dr, Clermont, FL 34711	2007	2	60 x 40	Asphalt Shingle	Hip	2007	S
10922 Lemay Dr, Clermont, FL 34711	2008	1	60 x 40	Asphalt Shingle	Hip	2008	N
10930 Lemay Dr, Clermont, FL 34711	2009	1	40 x 70	Asphalt Shingle	Hip	2009	N
10936 Lemay Dr, Clermont, FL 34711	2009	1	40 x 65	Asphalt Shingle	Hip	2009	N
10942 Lemay Dr, Clermont, FL 34711	2009	1	40 x 65	Asphalt Shingle	Hip	2009	N
10948 Lemay Dr, Clermont, FL 34711	2009	1	40 x 60	Asphalt Shingle	Hip	2009	N
10954 Lemay Dr, Clermont, FL 34711	2010	2	50 x 70	Asphalt Shingle	Hip	2010	N
11000 Lemay Dr, Clermont, FL 34711	2009	2	40 x 55	Asphalt Shingle	Hip	2009	N
11006 Lemay Dr, Clermont, FL 34711	2009	1	40 x 60	Asphalt Shingle	Hip	2009	N
11012 Lemay Dr, Clermont, FL 34711	2009	1	40 x 65	Asphalt Shingle	Hip	2009	N
11018 Lemay Dr, Clermont, FL 34711	2009	1	40 x 70	Asphalt Shingle	Hip	2009	N
11024 Lemay Dr, Clermont, FL 34711	2009	1	40 x 60	Asphalt Shingle	Hip	2009	N

11052 Lemay Dr, Clermont, FL 34711	2009	1	40 x 65	Asphalt Shingle	Hip	2009	N
12805 Fish Ln, Clermont, FL 34711	2007	1	60 x 45	Asphalt Shingle	Hip	2007	S
12811 Fish Ln, Clermont, FL 34711	2008	1	50 x 60	Asphalt Shingle	Hip	2008	S
12817 Fish Ln, Clermont, FL 34711	2009	1	50 x 55	Asphalt Shingle	Hip	2009	S
12823 Fish Ln, Clermont, FL 34711	2008	2	50 x 60	Asphalt Shingle	Hip	2008	S
12829 Fish Ln, Clermont, FL 34711	2008	1	40 x 60	Asphalt Shingle	Hip	2008	S
12835 Fish Ln, Clermont, FL 34711	2007	2	50 x 65	Asphalt Shingle	Hip	2007	S
12841 Fish Ln, Clermont, FL 34711	2007	1	50 x 45	Asphalt Shingle	Hip	2007	S
12847 Fish Ln, Clermont, FL 34711	2007	1	50 x 70	Asphalt Shingle	Hip	2007	S
12853 Fish Ln, Clermont, FL 34711	2007	1	50 x 70	Asphalt Shingle	Hip	2007	S
12905 Fish Ln, Clermont, FL 34711	2007	1	50 x 50	Asphalt Shingle	Hip	2007	S
12911 Fish Ln, Clermont, FL 34711	2010	1	60 x 45	Asphalt Shingle	Hip	2010	S
12917 Fish Ln, Clermont, FL 34711	2007	1	50 x 65	Asphalt Shingle	Hip	2007	S
12804 Fish Ln, Clermont, FL 34711	2008	1	50 x 70	Asphalt Shingle	Hip	2008	N
12810 Fish Ln, Clermont, FL 34711	2011	2	60 x 40	Asphalt Shingle	Hip	2011	N
12816 Fish Ln, Clermont, FL 34711	2009	1	40 x 60	Asphalt Shingle	Hip	2009	N
12822 Fish Ln, Clermont, FL 34711	2011	2	60 x 40	Asphalt Shingle	Hip	2011	N
12828 Fish Ln, Clermont, FL 34711	2009	1	35 x 55	Asphalt Shingle	Hip	2009	N
12834 Fish Ln, Clermont, FL 34711	2011	2	60 x 40	Asphalt Shingle	Hip	2011	N
12840 Fish Ln, Clermont, FL 34711	2011	2	60 x 45	Asphalt Shingle	Hip	2011	N
12846 Fish Ln, Clermont, FL 34711	2009	1	40 x 65	Asphalt Shingle	Hip	2009	N
12852 Fish Ln, Clermont, FL 34711	2009	2	35 x 55	Asphalt Shingle	Hip	2009	N
12904 Fish Ln, Clermont, FL 34711	N/A	2	60 x 40	Asphalt Shingle	Hip	N/A	N
12910 Fish Ln, Clermont, FL 34711	2010	1	50 x 60	Asphalt Shingle	Hip	2010	N
12916 Fish Ln, Clermont, FL 34711	2009	2	50 x 65	Asphalt Shingle	Hip	2009	N

12803 Hyland Ln, Clermont, FL 34711	2008	2	50 x 65	Asphalt Shingle	Hip	2008	S
12809 Hyland Ln, Clermont, FL 34711	2008	1	50 x 65	Asphalt Shingle	Hip	2008	S
12815 Hyland Ln, Clermont, FL 34711	2010	1	55 x 65	Asphalt Shingle	Hip	2010	S
12821 Hyland Ln, Clermont, FL 34711	2009	1	40 x 70	Asphalt Shingle	Hip	2009	S
12827 Hyland Ln, Clermont, FL 34711	2010	1	50 x 65	Asphalt Shingle	Hip	2010	S
12833 Hyland Ln, Clermont, FL 34711	2008	2	50 x 65	Asphalt Shingle	Hip	2008	S
12839 Hyland Ln, Clermont, FL 34711	2011	2	60 x 40	Asphalt Shingle	Hip	2011	S
12845 Hyland Ln, Clermont, FL 34711	2009	2	50 x 40	Asphalt Shingle	Hip	2009	S
12851 Hyland Ln, Clermont, FL 34711	2009	1	40 x 60	Asphalt Shingle	Hip	2009	S
12903 Hyland Ln, Clermont, FL 34711	2010	2	50 x 65	Asphalt Shingle	Hip	2010	S
12909 Hyland Ln, Clermont, FL 34711	2011	2	60 x 45	Asphalt Shingle	Hip	2011	S
12915 Hyland Ln, Clermont, FL 34711	2009	1	50 x 60	Asphalt Shingle	Hip	2009	S
12802 Hyland Ln, Clermont, FL 34711	2007	2	40 x 45	Asphalt Shingle	Hip	2007	N
12808 Hyland Ln, Clermont, FL 34711	2007	1	50 x 60	Asphalt Shingle	Hip	2007	N
12814 Hyland Ln, Clermont, FL 34711	2008	2	40 x 45	Asphalt Shingle	Hip	2008	N
12820 Hyland Ln, Clermont, FL 34711	2008	2	50 x 60	Asphalt Shingle	Hip	2008	N
12826 Hyland Ln, Clermont, FL 34711	2008	1	30 x 60	Asphalt Shingle	Hip	2008	N
12832 Hyland Ln, Clermont, FL 34711	2007	1	50 x 45	Asphalt Shingle	Hip	2007	N
12838 Hyland Ln, Clermont, FL 34711	2008	1	50 x 60	Asphalt Shingle	Hip	2008	N
12844 Hyland Ln, Clermont, FL 34711	2008	2	50 x 65	Asphalt Shingle	Hip	2008	N
12850 Hyland Ln, Clermont, FL 34711	2008	1	40 x 60	Asphalt Shingle	Hip	2008	N
12902 Hyland Ln, Clermont, FL 34711	2008	1	50 x 45	Asphalt Shingle	Hip	2008	N
12908 Hyland Ln, Clermont, FL 34711	2007	1	60 x 40	Asphalt Shingle	Hip	2007	N
12914 Hyland Ln, Clermont, FL 34711	2007	2	40 x40	Asphalt Shingle	Hip	2007	N
12801 Cloverdale Ln, Clermont, FL 34711	2006	1	55 x 65	Asphalt Shingle	Gable	2006	S

12807 Cloverdale Ln, Clermont, FL 34711	2006	2	40 x 50	Asphalt Shingle	Hip	2006	S
12813 Cloverdale Ln, Clermont, FL 34711	2006	1	55 x 65	Asphalt Shingle	Hip	2006	S
12813 Cloverdale Ln, Clermont, FL 34711	2006	1	50 x 45	Asphalt Shingle	Gable	2006	S
12825 Cloverdale Ln, Clermont, FL 34711	2006	1	50 x 65	Asphalt Shingle	Hip	2006	S
12831 Cloverdale Ln, Clermont, FL 34711	2006	1	50 x 60	Asphalt Shingle	Hip	2006	S
12837 Cloverdale Ln, Clermont, FL 34711	2006	2	40 x 45	Asphalt Shingle	Hip	2006	S
12843 Cloverdale Ln, Clermont, FL 34711	2006	1	55 x 60	Asphalt Shingle	Hip	2006	S
12849 Cloverdale Ln, Clermont, FL 34711	2006	1	55 x 60	Asphalt Shingle	Hip	2006	S
12901 Cloverdale Ln, Clermont, FL 34711	2006	1	60 x 65	Asphalt Shingle	Hip	2006	S
12907 Cloverdale Ln, Clermont, FL 34711	2006	2	40 x 45	Asphalt Shingle	Hip	2006	S
12913 Cloverdale Ln, Clermont, FL 34711	2005	1	50 x 60	Asphalt Shingle	Hip	2005	S