



## **Environmental Advisory Committee**

4:00 p.m., Thursday, September 12, 2024

Council Chambers

1207 Palm Boulevard, Isle of Palms, SC 29451

### **Agenda**

1. **Call to order** and acknowledgment that the press and the public have been duly notified of the meeting in accordance with the Freedom of Information Act

2. **Citizen's Comments**

3. **Approval of previous meeting's minutes** – July 11, 2024

4. **Presentations** – Susan Hill Smith – beach trash can pilot study

5. **Old Business**

- i. Wildlife
- ii. Litter- discuss concept of beach trash receptacle pilot program
- iii. Water Quality- update on water quality testing program
- iv. Climate Action

6. **New Business**

- i. Discussion of which issues to include on website
- ii. Update on EAC table at the upcoming IOP Farmers Market
- iii. Discussion of installing compost liner dispensers at compost drop-off locations
- iv. Discussion of light pollution and exterior lighting ordinance

7. **Miscellaneous Business**

Next meeting date: 4:00 p.m., Thursday, October 10, 2024

8. **Adjournment**



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  - iv. Discussion of light pollution and exterior lighting ordinance
  - v. Update on draft Sea Level Rise Adaptation DRAFT
7. **Miscellaneous Business**

Next meeting date: 4:00 p.m., Thursday, October 10, 2024
8. **Adjournment**



## **ENVIRONMENTAL ADVISORY COMMITTEE**

**4:00pm, Thursday, July 11, 2024**

**1207 Palm Boulevard, Isle of Palms, SC**

**and broadcasted live on YouTube: <https://www.youtube.com/user/cityofisleofpalms>**

### **MINUTES**

**1. Call to order**

Present: Sandra Brotherton, Mary Pringle, Todd Murphy, Laura Lovins, Doug Hatler, Dane Buckout, Council Member Miars

Absent: Lucia Spiotta, Belvin Olasov

Staff Present: Director Kerr, Zoning Administrator Simms, Asst. Director Asero

**2. Citizen's Comments -- none**

**3. Approval of previous meeting's minutes**

**MOTION: Ms. Lovins made a motion to approve the minutes of the May 9, 2024 meeting, and Ms. Pringle seconded the motion. The motion passed unanimously.**

**4. Presentation – none**

**5. Old Business**

**A. Wildlife**

Ms. Pringle said the benches have been installed at the native plants garden. She also spoke about a successful nesting season for the purple martins. She said there are approximately 50 turtle nests across the island, and they are due to start hatching next week. Many have had to be relocated due to the high tides and work on the beach.

**B. Litter**

Dr. Brotherton noted that there seems to be a lot more beach trash this year. Council Member Miars shared the discussion from the Public Services & Facilities Committee earlier in the week about the trash cans on the beach. Having trash cans on the beach is creating more trash on the beach. Additionally, it is logistically difficult and expensive to empty the cans. The current contract for beach trash can pickup is due to end next September, and the City would like to initiate a pilot program to help them determine the specifications of a new contract. Director Kerr explained how trash pickup is done currently, adding it will be challenging to find a replacement service. He also said that beach trash pickup is not something that can be done by Public Works since most of the trash is generated over the weekends.

The City would like to build a trash receptacle closer to the road of a beach access path to see how beachgoer behavior changes with regards to trash removal. Director Kerr said staff has identified the 25<sup>th</sup> Avenue beach access as a place where a trash corral could be built and easily monitored to provide the City with helpful data.

After discussion about the need for proper signage, it was agreed that the City would build two pilot trash corrals at 25<sup>th</sup> Avenue and another access by Wild Dunes. Mr. Murphy will help in selecting the proper access to monitor.

**C. Water Quality**

City Council has approved the water quality proposal, and Mr. Hatler will work with GEL to select the proper outfalls from which to pull samples.

**D. Climate Action**

Director Kerr reported that City Council passed a resolution in support of County Council passing their Climate Action Plan. He will forward a copy of the resolution to Committee members. The Committee will discuss steps the City can take to support the Climate Action Plan at a future meeting.

Zoning Administrator Simms said the bid for the solar panels for the Public Works building will go out next week.

**6. New Business**

**A. Discussion of which issues to include on the website**

Director Kerr said that the PR Officer is unclear as to what the Committee wants on the City's website. Dr. Brotherton will reach out to her and provide more specific information.

**B. Update on EAC hosting a table at the upcoming IOP Farmers Market**

Ms. Lovins said that many of the food composting buckets were given out at the June Farmers Market. She said she had information available about septic tanks, but most of the people who visited the table were already on sewer. The next Farmer's Market will be July 18.

**C. Discussion of installing compost liner dispensers at compost drop-off locations**

Ms. Lovins said that Megan McGill can service dispensers of compost liners for an additional \$110/month. The dispensers will cost \$191 each. Ms. McGill will review the usage of the bags and share data on a quarterly basis to determine if more or less work is needed. Director Kerr said he would reach out to Ms. McGill to get the dispensers and the bags.

**6. Miscellaneous Business**

7.       **Adjournment**

The next meeting of the Environmental Advisory Committee is scheduled for Thursday, September 12, 2024 at 4pm.

Mr. Murphy made a motion to adjourn, and Mr. Hatler seconded the motion. The meeting was adjourned at 5:19pm.

Respectfully submitted,

Nicole DeNeane  
City Clerk

**From:** [susanhillsmith@gmail.com](mailto:susanhillsmith@gmail.com)  
**To:** [Sandra Brotherton](#); [Robert Asero](#); [Douglas Kerr](#)  
**Subject:** [EXTERNAL] Trash Can Litter test numbers  
**Date:** Tuesday, September 10, 2024 2:37:20 PM  
**Attachments:** [inky-injection-inliner-209b06d63f3139b7bbda7129634c80da.png](#)  
[inky-injection-inliner-6f42d488d348cfd86bff9497caf9f6a.png](#)

[EXTERNAL]



External (susanhillsmith@gmail.com)



Hi Sandy, Robert & Douglas,  
Apologies for not getting this information to you sooner. My life got unexpectedly hectic the past month!

I hope I will be able to talk about the results of our test and my related thoughts as a guest presenter at EAC Thursday without a 3-minute time limit.

### **25th Ave Beach Access Trash Can Litter Test**

Test details

**Week 1** - July 19-25 - control week with the City's traditional setup of several unlidded, yellow beach trash barrels

**Week 2** - July 26-Aug 2 no trash cans on the beach. Instead several green trash cans with lids (typically used by the city for residential garbage pick up) were placed at the start of the beach access path close to the roadway. Plus signs to leave only footprints and not leave large items like umbrellas and chairs were placed along the path.

Sandy & I alternated with near daily pick-ups of the same two-block area of the beach centered around the 25th Avenue access and included the access path.

Before the test, I did a good litter sweep July 17 to start with as much of a clean slate as possible.

However, it's likely more of the trash collected the first week originated in days or weeks prior than during the second week because the area got much more attention than usual during the first week.

Also, the activity and number of visitors to that beach access was probably busier the first week than the second as the season started to slow some.

**Week 1** - uncovered trash cans on the beach: **691**

**Week 2** - uncovered cans removed from the beach with green trash cans close to road & litter prevention signs placed along path: **615**

My unexpert opinion is that this is probably a neutral result - ie seems to suggest one approach is no better than the other, as we would have expected Week 2 to have less trash because of the already mentioned factors, plus some windy weather that probably blew more litter than usual into the dunes, and the positive impact of the signs in litter prevention probably had an impact on the numbers.

However, strong caution on putting a lot of weight in these results since it's a snapshot of one specific period (past the height of the season) and place. Fourth of July could've been an entirely different story without trash cans on the beach - but then you could put temporary cans out there on the beach during those really busy moments in the season.

### **My additional thoughts & feedback**

- Thank you for moving away from uncovered trash cans, for all the reasons we've discussed previously. Bottom line, the yellow cans probably helped more in an earlier era when trash clearly would have been worse without them, but I believe the trash that escapes and spills out from the yellow cans these days is now a greater percentage of the litter problem than it used to be.
- I'm not convinced that using the green city trash bins is the best switch. Most of all, I think cutting a hole in the top of the lid looks a little messy & easily gets problematic. One day during the test I saw someone stuffed in an umbrella that was poking out & making the bin unusable. Will the cans drain rainwater? Even though the newer green bins look nice from the outside, we have definitely noticed that they get disgusting on the inside when used at Front Beach and don't seem to get cleaned out very often.
- FYI, I hear Pawleys Island has been testing out Big Belly, trash cans.
- Whenever I mention the idea of taking trash cans away from the beach, people who care have real and often strong concerns. Some also say that they like having the cans on the beach so they can easily throw litter items they collect while walking, etc. I have similar concerns and probably would like to see some kind of hybrid approach where large access points have at least one covered, stable trash-can on the beach for small amounts of trash, with messaging that there are receptacles for larger amounts of trash closer to the roadside.
- It may be even more important to add stable dog waste stations - on or very close to the beach - that are attached to an in-ground post and serviced by a contractor. The best possibility (and an environmental win) would be if they could also take that waste and have it composted. If you make the switch, I would at the very least like to see dog composting stations at a reasonable number of access paths.
- When making all these changes, please keep in mind that the Community Enrichment Task Force will probably be advocating for adding more trash bucket trees, toy bins, and benches at major beach access paths as well.

Hope that all makes sense and happy to continue this conversation through email and or on Thursday.

Best,

Susan

Susan Hill Smith

843-270-9947

[susanhillsmith@gmail.com](mailto:susanhillsmith@gmail.com)



**From:** [Todd Murphy](#)  
**To:** [Douglas Kerr](#); [Sandra Brotherton](#)  
**Cc:** [Spiotta, Lucia](#)  
**Subject:** September EAC meeting topic  
**Date:** Thursday, September 5, 2024 10:48:53 AM  
**Attachments:** [Pawleys Streetlights Letter to Editor.jpg](#)  
[Folly Streetlights Initiative.doc](#)  
[Folly Beach Exterior Lighting Ordinance.pdf](#)

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Douglas, Sandy:

Lucia and I have been doing some research regarding light pollution and exterior lighting ordinances. IOP currently has a lighting ordinance regarding beachfront properties. The purpose of that ordinance is to protect sea turtles and other wildlife on the beach. However, for homes that are not on the beachfront, there isn't an ordinance to protect humans (neighbors) or wildlife in lagoons and forests from homeowners installing high intensity lights that illuminate much more than their property.

We would like to discuss the topic of Exterior Lighting with the EAC during the upcoming meeting. Attached are 3 documents to support the discussion:

- 1) Letter to editor from a Pawley's Island resident (I believe Mary Pringle shared this with the EAC at a recent meeting) highlighting the need for limitations on exterior lighting
- 2) Southern Living article about Folly Beach / Dominion Energy streetlight initiative to help alleviate light pollution
- 3) Current Folly Beach ordinances related to external lighting for homeowners. Of the neighboring barrier islands, Folly Beach seems to have the most detailed and well thought out ordinance regarding exterior lighting

Thanks in advance!

Todd

## **§ 166.10 EXTERIOR LIGHTING.**

### **§ 166.10-01 Purpose.**

The purpose of this section is to control light spillage and glare so as not to adversely affect motorists, pedestrians, natural areas, vistas, and land uses of adjacent properties. More specifically, this section is intended to:

- (A) Control lighting to assure that excessive light spillage and glare are not directed at adjacent properties, neighboring areas, and motorists;
- (B) Ensure that all site lighting is designed and installed to maintain adequate lighting levels on site;
- (C) Provide security for persons and land; and
- (D) Avoid negative impacts to wildlife from exterior lighting.

(Ord. 05-10, passed 3-23-10; Am. Ord. 06-19, passed 4-9-19)

### **§ 166.10-02 Applicability.**

(A) *General.* Unless exempted in accordance with § 166.10-03, Exemptions, the provisions of this section apply to all zoning districts within the city.

(B) *Time of compliance.* A lighting plan shall be submitted with an application for a site plan, § 162.03-06; preliminary subdivision plat, § 162.03-07(D); or zoning permit, § 162.03-13, whichever is appropriate.

(Ord. 05-10, passed 3-23-10)

### **§ 166.10-03 Exemptions.**

The standards of this section shall not apply to city-owned, operated, or maintained street lights located within a street right-of-way or other easement granted to the city.

(Ord. 05-10, passed 3-23-10)

### **§ 166.10-04 Design Standards For Exterior Lighting.**

All exterior lighting shall conform to the following standards:

(A) *Maximum lighting height.*

- (1) Except for outdoor sports fields or performance areas, outdoor lighting heights shall be no greater than:
  - (a) Eighteen feet above grade for pedestrian lighting; and

(b) Thirty feet above grade for vehicular lighting.

(2) Wherever possible, illumination of outdoor seating areas, building entrances, and walkways shall be accomplished by use of ground-mounted fixtures not more than four feet in height.

(B) *Illumination direction.*

(1) In all districts, lighting of nonresidential development shall be directed downward. In addition, upwardly-directed lighting shall not be used to illuminate structures, except for low-wattage architectural lighting.

(2) Outdoor lighting shall not shine directly into the yard or windows of adjacent residential uses.

(3) Outdoor lighting on residential or commercial structures facing the Folly River must be shielded so that light is directed downward and does not shine directly onto the river.

(C) *Location.* All lighting shall be located at least ten feet from side lot lines, rear lot lines, or required perimeter buffers.

(D) *Shielding.*

(1) Light fixtures in excess of 60 watts or 100 lumens shall use full cut-off lenses or hoods to prevent glare or spillover from the project site onto adjacent lands and streets.

(2) No interior light source shall be positioned, aimed, or configured so as to result in the light source being visible from land occupied by existing residential development.

(3) No light source in a canopy structure shall extend downward further than the lowest edge of the canopy ceiling.

(4) Awnings or canopies used for building accents over doors, windows, etc., shall not be internally illuminated (i.e., from underneath or behind the awning).

(E) *Maximum light levels.* All outdoor lighting shall be designed and located such that the maximum illumination measured in foot candles at the property line shall not exceed one foot candle. The average intensity illumination for outdoor lighting shall not exceed four foot candles in intensity as measured at grade. Vehicular use area lighting shall not exceed a maintained average of two-and-one-half foot candles.

(F) *Uniformity ratios.*

(1) In order to maintain uniformity in light levels across a development, and prevent or minimize dark areas, the ratio of maximum to minimum lighting levels on a given site or parcel of land as measured in foot candles at ground level, shall not exceed 15:1 in the residential districts or 10:1 in the nonresidential districts. Parking lots shall maintain the same uniformity ratios as the principal use they serve. In the cases of mixed uses, the uniformity ratios for nonresidential districts shall apply.

(2) The quantity of fixtures to be provided shall be based upon the desired level of uniform illumination as established by the current standards of the Illuminating Engineering Society of North America (IESNA).

(G) *Hue*. All outdoor and parking lot lighting fixtures, including: metal halide, mercury vapor, fluorescent, induction, white high-pressure sodium and color-improved high-pressure sodium lamps used in non-cutoff fixtures shall be coated with an internal white frosting inside the outer lamp envelope.

(H) *Additional standards in beachfront areas*. For purposes of protecting nesting sea turtle habitat, the following standards shall apply to all uses on lots adjacent to the beachfront;

- (1) The source of illumination shall not be directly visible from the beach.
- (2) Exterior lighting within sight of the beach shall be a maximum of 50 watts and designed with recessed fixtures.
- (3) Low-intensity lighting set on a base no higher than 48 inches off of the ground shall be utilized in parking lots.

(4) Parking lots shall be sited so as to minimize headlight glare directed on the beach, or shall incorporate ground-level barriers to mitigate the effects of headlights on beach areas.

(Ord. 05-10, passed 3-23-10; Am. Ord. 06-19, passed 4-9-19)

#### **§ 166.10-05 Wall-Mounted Lights.**

Wall-mounted lights shall be fully shielded luminaries (such as shoebox or can style fixtures) to prevent the light source from being visible from any adjacent residential property or public street right-of-way. Nothing in this subsection shall prevent the use of sconces or other decorative lighting fixtures provided that the source of illumination is not visible from adjacent lands used or zoned for residential purposes, and provided that the maximum illumination values comply with the standards in § 166.10-04(E), Maximum Light Levels.

(Ord. 05-10, passed 3-23-10)

#### **§ 166.10-06 Floodlights and Spotlights.**

Floodlights and spotlights shall be selected, located, aimed, and shielded so that direct illumination is focused exclusively on a portion of the building facade or other intended site feature and away from adjoining lands or the right-of-way. On-site lighting may be used to accent architectural elements but shall not be used to illuminate entire portions of building(s). Such lighting shall be installed in a fixture that is shielded so that no portion of the light bulb extends below the bottom edge or above the top edge of the shield, and the main beam from the light source is not visible from adjacent lands of the adjacent right-of-way. Floodlights or other type of lighting attached to light poles that illuminate the site or building(s) are prohibited.

(Ord. 05-10, passed 3-23-10)

#### **§ 166.10-07 Wall Pack Lights.**

Wall packs on buildings may be used at entrances to a building to light unsafe areas. They are not intended to draw attention to the building or provide general building or site lighting. Wall packs on the exterior of the building shall be fully shielded (true cut-off type bulb or light source not visible from off-site) to direct the light downward and be of low wattage (preferably 100 watts or lower). Other accent lighting projected onto buildings may be allowed provided that it is approved through the development plan process.

(Ord. 05-10, passed 3-23-10)

**§ 166.10-08 Illumination of Outdoor Sports Fields and Performance Areas.**

All lighting fixtures serving outdoor sports fields and performance areas shall be equipped with a glare control package (e.g., louvers, shields, or similar devices), and the fixtures shall be aimed so that their beams are directed and fall within the primary playing or performance area.

(Ord. 05-10, passed 3-23-10)

**§ 166.10-09 Sign Lighting.**

Lighting fixtures illuminating signs shall comply with the standards of this section, and such fixtures shall be aimed and shielded so that direct illumination is focused exclusively on the sign face.

(Ord. 05-10, passed 3-23-10)

## LED streetlights

New, more efficient light bulbs have been used by homeowners for many years as a way to save energy and reduce electric bills. Power companies are doing the same with streetlights.

In Georgetown County, Santee Cooper started replacing low-pressure sodium street lights in my community, Heritage Plantation on Pawleys Island.

It started on an as-needed basis; when high-pressure sodium lights failed, they would be replaced with high-intensity LED lights.

That soon generated complaints by residents in the community because the new lights were so bright.

It also generated concerns with the homeowners association because converting to LED lights costs property owners more money, even though the new lights use less electricity.

Several homeowners investigated the new LED lights both from a cost perspective as well as their excessive brightness.

In the process, they discovered that the bright lights were contrary to the American Medical Association recommendations.

They had a rating of 4,000 Kelvin, which is in the blue spectrum, and an intensity of 6,000 lumens, which is very bright.

Among the things they learned from AMA is that excessive blue light affects melatonin, and that leads to a number of health issues in humans as well as animals.

The intense brightness of the new LEDs affects the human eye, which increases glare to the point that nighttime vision is reduced. This decrease in visual acuity raised safety concerns about night driving.

Eventually, Heritage Plantation persuaded Santee Cooper to reduce the brightness of the LEDs from 6,000 to 2,500 lumens and, more important, to reduce the color temperature from 4,000 to 3,000 Kelvin.

While this is a pilot project for Santee Cooper, the changes in my community have been dramatic.

I would encourage all communities to accept only the low-intensity LEDs when they need new streetlights.

PETER EISENBERG  
*Pawleys Island*

CITY OF ISLE OF PALMS

# SEA LEVEL RISE ADAPTATION PLAN

**SW**  
SEAMONWHITESIDE



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# INTRODUCTION

# PROJECT BACKGROUND



The City of Isle of Palms is a focal point for the Charleston area, is home to thousands of residents, and serves as a vacationing playground for millions around the globe. Life on Isle of Palms depends on a pristine landscape and flowing coastal waterways. However, sea level rise may cause those recreational waterways to become the city's greatest threat if ignored.



Based on the premonition of future flooding from sea level rise, the City has made an instrumental decision to begin planning for the future.



The purpose of this sea level rise adaptation plan is to outline the potential flood risk of sea level rise, provide strategies for adapting to sea level rise both ethically and cost effectively, outline potential projects that will mitigate against sea level rise, and identify potential funding sources the city can leverage to implement adaptation strategies and improvement projects.

# CURRENT & ONGOING PROJECTS

## 1 DRAINAGE STUDY & MASTER PLAN

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## 2 WATERWAY BLVD. IMPROVEMENTS

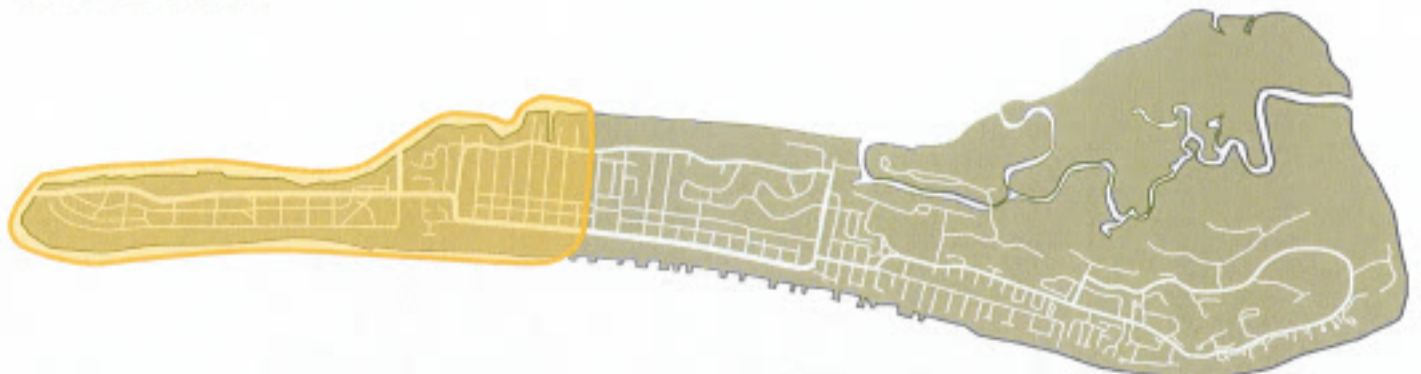
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## 3 BEACH PRESERVATION



# 1 DRAINAGE STUDY & MASTER PLAN

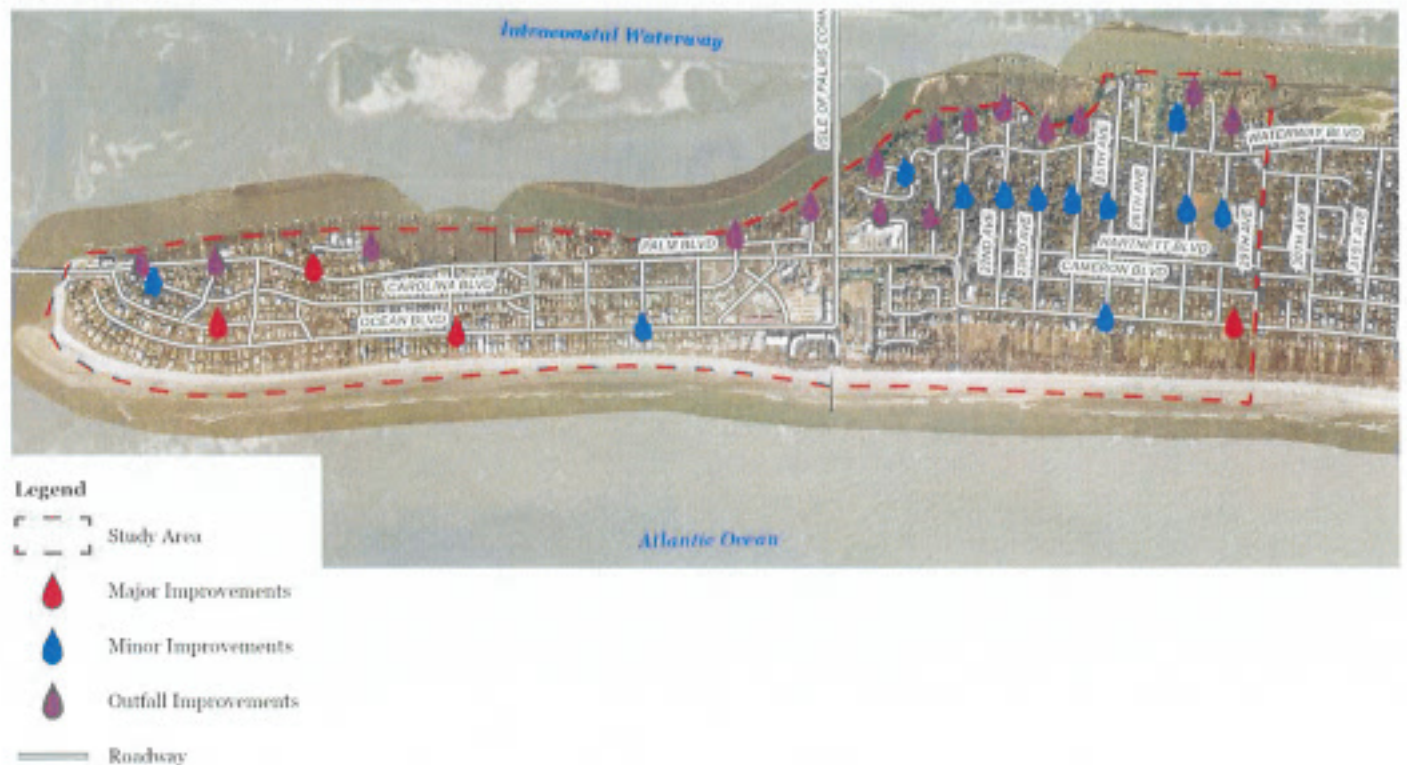
COMPLETED 2023



A comprehensive drainage study was recently (2023) completed for the area between Breach Inlet and 29th Avenue. The purpose of this study was to complete a full inventory and assessment (including documentation and recommendations of immediate maintenance priorities) of existing drainage infrastructure and develop solutions to address systemic rainfall and coastal-driven flooding.

Additional project components included providing resilience planning to address future climate change conditions in the final project recommendations, public engagement and involvement using stakeholder meetings and web-based tools, deploying real-time monitoring stations to calibrate/validate hydraulic analyses, reviewing and recommending changes to existing stormwater ordinances, and assessing potential funding avenues/sources (i.e., state or federal grants) for recommended projects.

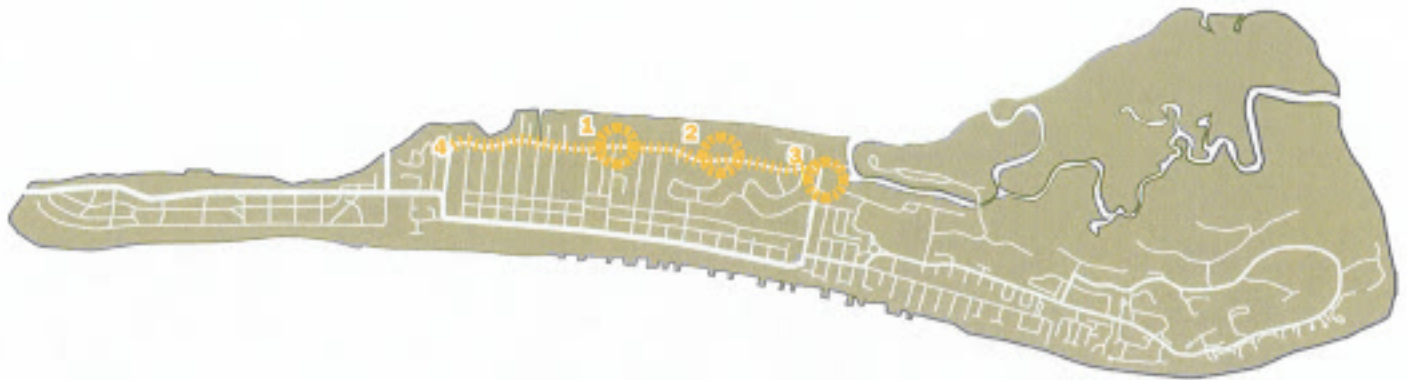
This project resulted in approximately 31 drainage improvement projects (with priority established) being recommended to mitigate flooding and sea level rise. These projects included a diverse mix of infrastructure improvements including low impact development, green infrastructure, pipe upgrades, cleaning out interior canals/ditches, installation of tide gates, dune infiltration systems, and vegetated berms. The next step will be for the city to secure funding for the design and construction of the high priority improvements (primarily the outfall and major improvements seen in Figure 1).



**Figure 1**  
Approximate locations of project recommendations (Davis & Floyd, 2023).

## 2 WATERWAY BLVD. IMPROVEMENTS

ONGOING + FUTURE



### 1 30th Street Improvements



Originally initiated by City Council in 2017, a drainage study was completed for the area between 29th Avenue and 41st Avenue. Outfall improvements recommended as part of this study have been completed for the drainage systems at 30th Avenue, 36th Avenue, and 41st Avenue. These outfall improvements will provide significant mitigation for tidal flooding as well as provide ancillary benefits to the performance of the upstream drainage infrastructure.

Additional smaller drainage improvements are also planned for areas around Sparrow Drive, Forest Trail, Cross Lane, and 32nd Avenue.

### 2 Forest Trail Improvements



### 3 41st Avenue Improvements



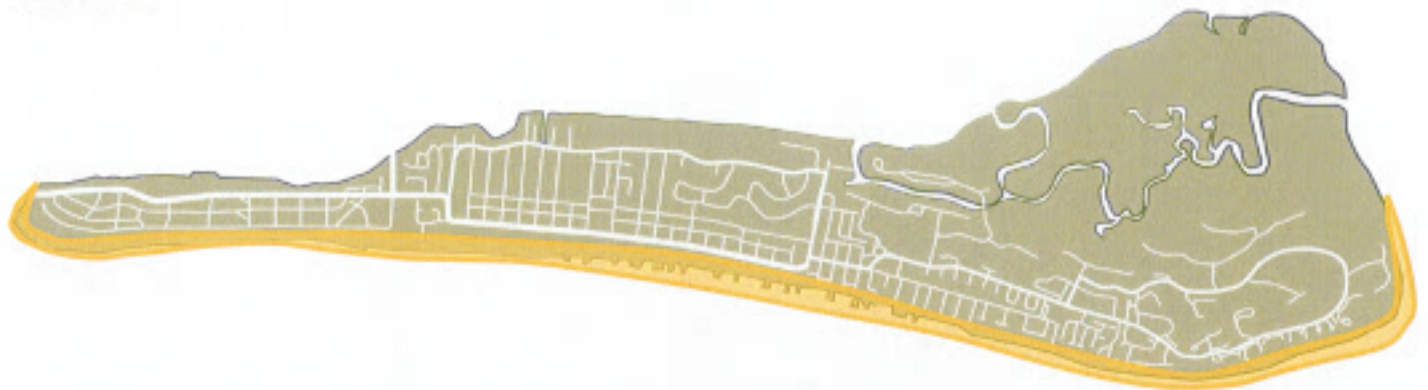
### 4 WATERWAY BLVD. MULTI-USE PATH ELEVATION PROJECT

The City is currently working on the design and engineering of the 1.7 mile Waterway Blvd. Multi-Use Path, which seeks to raise the path, while also improving local drainage and adding tide gates and valves to eliminate tidal intrusion.

The original study recommended a plan to improve tidal flooding protection to elevations 6 (NAVD 88), which would protect the City from most king tides. The City is evaluating the feasibility of increasing the level of protection by elevating the path an additional foot and pursuing grant funding to implement this project.

### 3 BEACH PRESERVATION

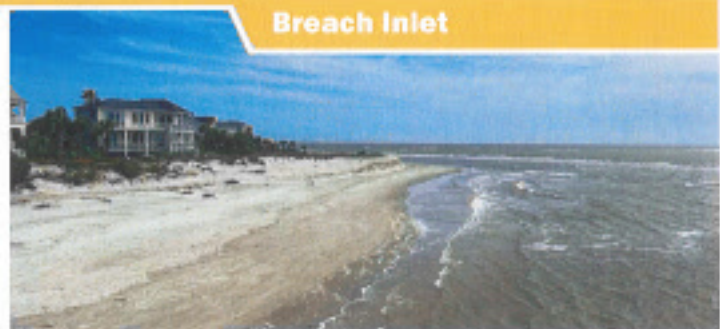
ONGOING



In 2018 1.6M cubic yards of sand was placed on the north end of the ocean facing beach near the Dewees Inlet side of the Island. This was a beach renourishment effort to help mitigate sever erosion spots as well as a shifting shoal in that area.



Breach Inlet has been suffering from episodic erosion caused by a shifting and widening channel in the inlet. In 2023, the US Army Corps of Engineers placed sand between Breach Inlet and 10th Ave. to prevent further erosion on that section of beach.



In combination with expected natural migration of sand, IOP intends to seek additional sources of sand for large scale nourishment. Sand search analysis would be in coordination with SHPO and BOEM and would include placement at both ends of the island.



# COMMUNITY & ENGAGEMENT



# PUBLIC SURVEY

As part of this Sea Level Rise Adaptation Plan, community feedback was gathered via an online survey with the following questions:



## PART 1: SEA LEVEL RISE IMPACTS & STRATEGIES

### 1. How concerned are you about the long term impacts of sea level rise on Isle of Palms?

1. Not at all concerned
2. Somewhat concerned, but other issues feel more pressing
3. Concerned - this is as important as many other issues facing IOP
4. Very concerned - this is the most critical issue
5. Other/Need more information

### 2. Please select the concerns related to increasing water levels you are most worried about:

1. Storm and tidal flooding
2. Road closures and infrastructure damage from flooding
3. Loss of native ecological habitat
4. Septic and waste water contamination
5. Displacement of residents
6. Other

### 3. Please select the sea level rise strategies you would like to see on Isle of Palms:

1. Dune renourishment
2. Improved storm drains
3. Underground stormwater storage
4. Living shorelines
5. Tidal control structures on drainage pipes
6. Vegetated berms along the marsh
7. Clean out interior canals for better drainage
8. Low Impact drainage (rain gardens and bioswales)
9. Other/Need more information

### 5. Please provide any additional comments or concerns related to sea level rise strategies.

### 4. The following are potential incentive programs targeted at encouraging homeowners and residents to bolster their property and neighbors' property from sea level rise. What, if any, of would you consider participating in?

1. Using rain barrels (to capture runoff for yard irrigation)
2. Adding rain gardens or bioswales in flood prone yards
3. Replacing lawn with native planting
4. Increasing tree canopy
5. Upgrading from septic to sewer
6. Reducing impervious surfaces
7. Installing a green roof
8. Adding a pollinator garden
9. Other

## PART 2: SITE SPECIFIC CONCERNS

### 1. Which of the following categories best describes your concerns:

1. Flooding
2. Septic tank concern
3. Natural/critical habitat concern
4. Beach erosion
5. Damage to structures
6. Damage to infrastructure (including pipes, drains, sidewalks, roads)
7. Other

### 3. Severity of concern:

1. Nuisance
2. Minor
3. Severe

### 2. Please locate on this map your area(s) of concern:



### 4. Photo upload and additional comments:

#### Upload Photos of Flooding (If Available)

Please upload photos of flooding. A maximum of 5 uploads are allowed per submission.

Drop image here or select image (maximum number of files allowed: 5)

#### Additional Comments

Please provide any additional details that you would like to include in your submission.



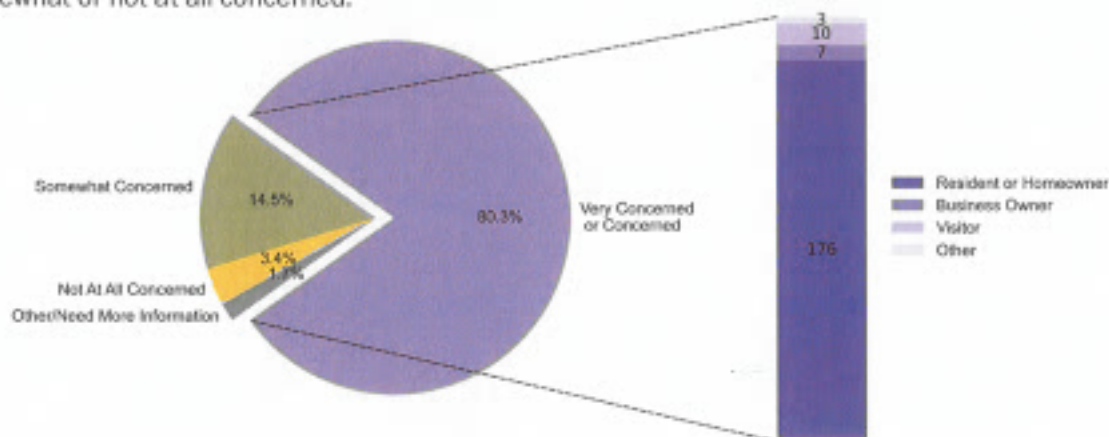
# SURVEY RESULTS

## 233 RESPONSES

221 Residents/Homeowners  
9 Business owners  
10 Visitors  
4 Other

### Level of Concern

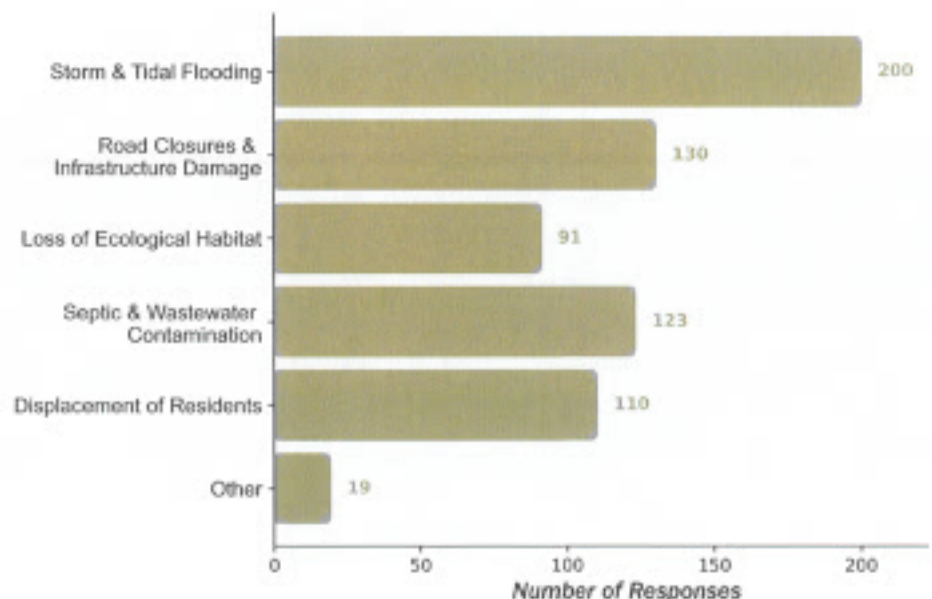
Of the 233 responses, the vast majority of respondents were very concerned or concerned about the impacts of sea level rise. Of those respondents who were concerned or very concerned, most were residents or homeowners. A small fraction of the respondents were somewhat or not at all concerned.



### Areas of Concern

Respondents were asked to choose what sea level rise impacts they were most concerned about. Storm and tidal flooding was identified as the highest area of concern amongst respondents. Road and infrastructure damage as well as septic contamination received the next most selections.

*"We are worried about the long-term viability of living on the island. It's our home and we don't want to go anywhere else..."*

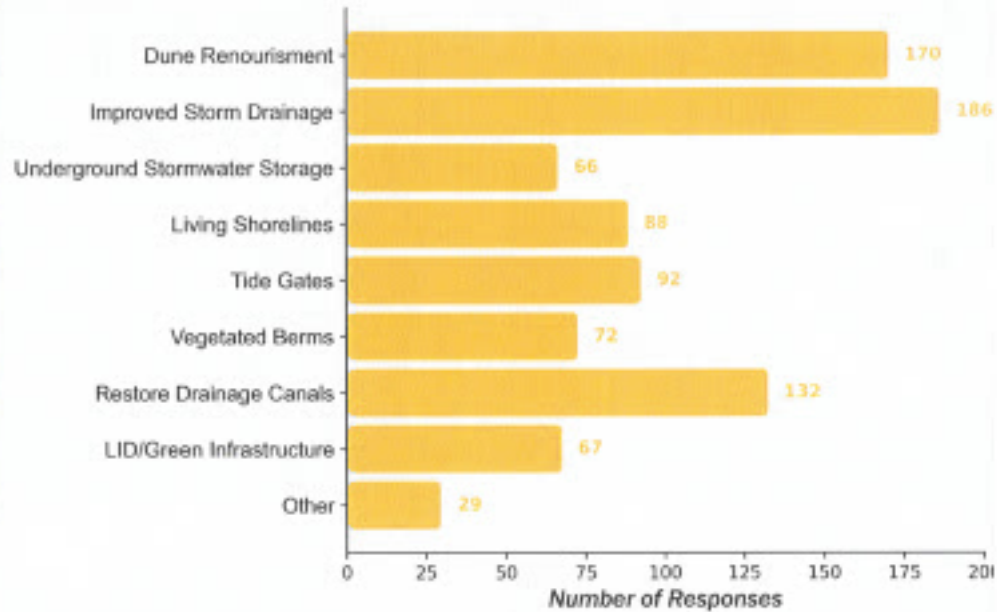


# SURVEY RESULTS

**“Extremely concerned about flooding in our area. The extent of water intrusion into our yard and garage has increased significantly over the past few years...”**

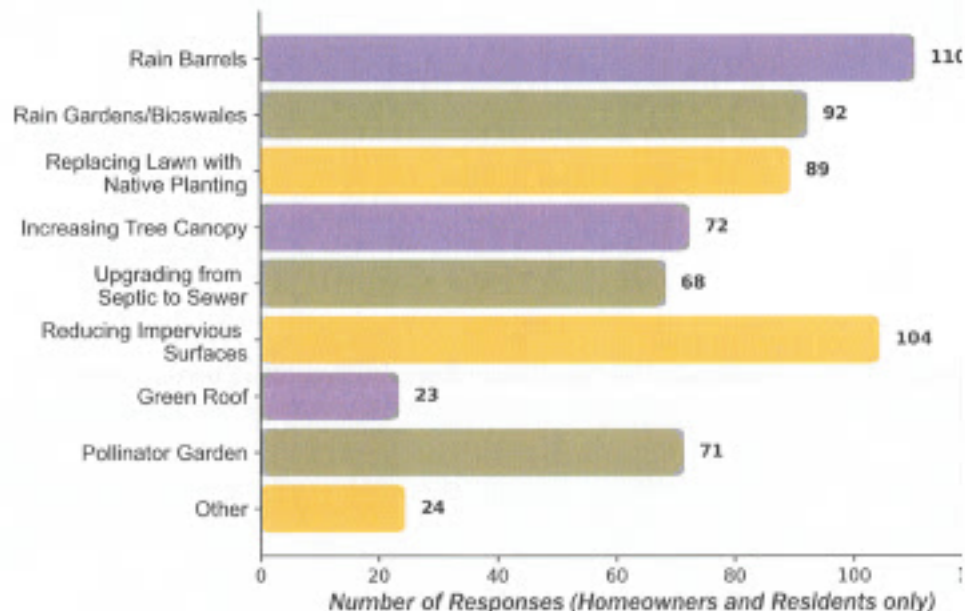
## SLR Strategy Interest

Respondents were asked to select the adaptation strategies they would most like to see the City take on. Grey infrastructure like improved storm drainage and restoring drainage canals were a top selection. Dune renourishment was the second highest chosen strategy. While green infrastructure strategies were not selected as frequently, they should still be considered for a holistic adaptation approach.



## Incentive Program Interest

Respondents were asked to select incentive programs they would be interested in participating in that would involve strategies to help mitigate the impacts of sea level rise on their properties. The top selections were rain barrels, reducing impervious surfaces, rain gardens/bioswales, and replacing lawn with native planting. These strategies should be most considered if the City were to adapt incentive programs moving forward.



# COMMITTEE MEETINGS

The following meetings happened during the spring of 2024 to help guide the creation of this planning document and establish the known concerns regarding sea level rise on Isle of Palms.

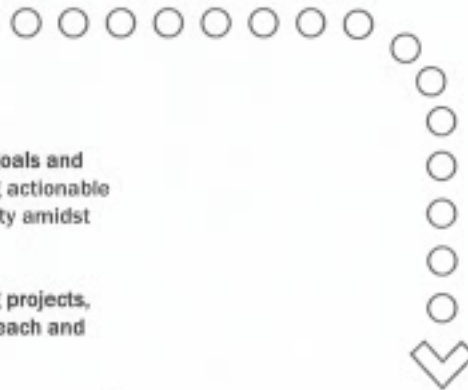
## TECHNICAL REVIEW COMMITTEE

2/22/2024

The Isle of Palms Technical Review Committee discussed the goals and strategies for the Sea Level Rise Adaptation Plan, emphasizing actionable steps to protect infrastructure and maintain community livability amidst rising sea levels and coastal flooding.

The committee reviewed existing data, completed and ongoing projects, and considered strategies from other communities like Folly Beach and Charleston to guide their efforts.

The meeting concluded with plans for future community engagement and coordination with the Planning Commission.

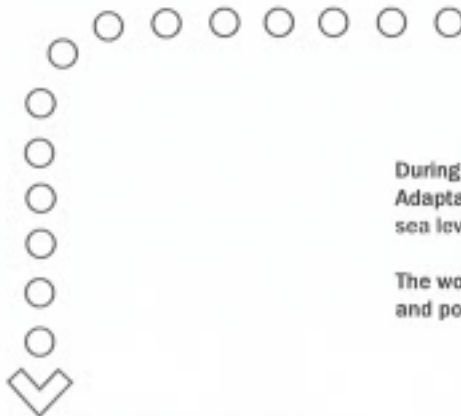


## PLANNING COMMISSION

5/08/2024

During the Isle of Palms Planning Commission workshop on the Sea Level Rise Adaptation Plan, the Planning Commission reviewed the project background, sea level rise projections through 2050 and discussed actionable strategies.

The workshop focused on the results from a preliminary vulnerability analysis and potential policies, programs, and projects which may mitigate these risks.



## ENVIRONMENTAL ADVISORY COUNCIL

5/09/2024

During the Environmental Advocacy Council meeting, the same feedback was generated as the Planning Commission Workshop. See the Planning Commission Meeting for details.

Additionally, the Environmental Council provided valuable feedback on environmental issues facing the island including subsidence, areas of known flooding, and the importance of low-impact development. Their feedback was instrumental in guiding the key elements of the plan.



# SEA LEVEL RISE AND VULNERABILITY ANALYSIS



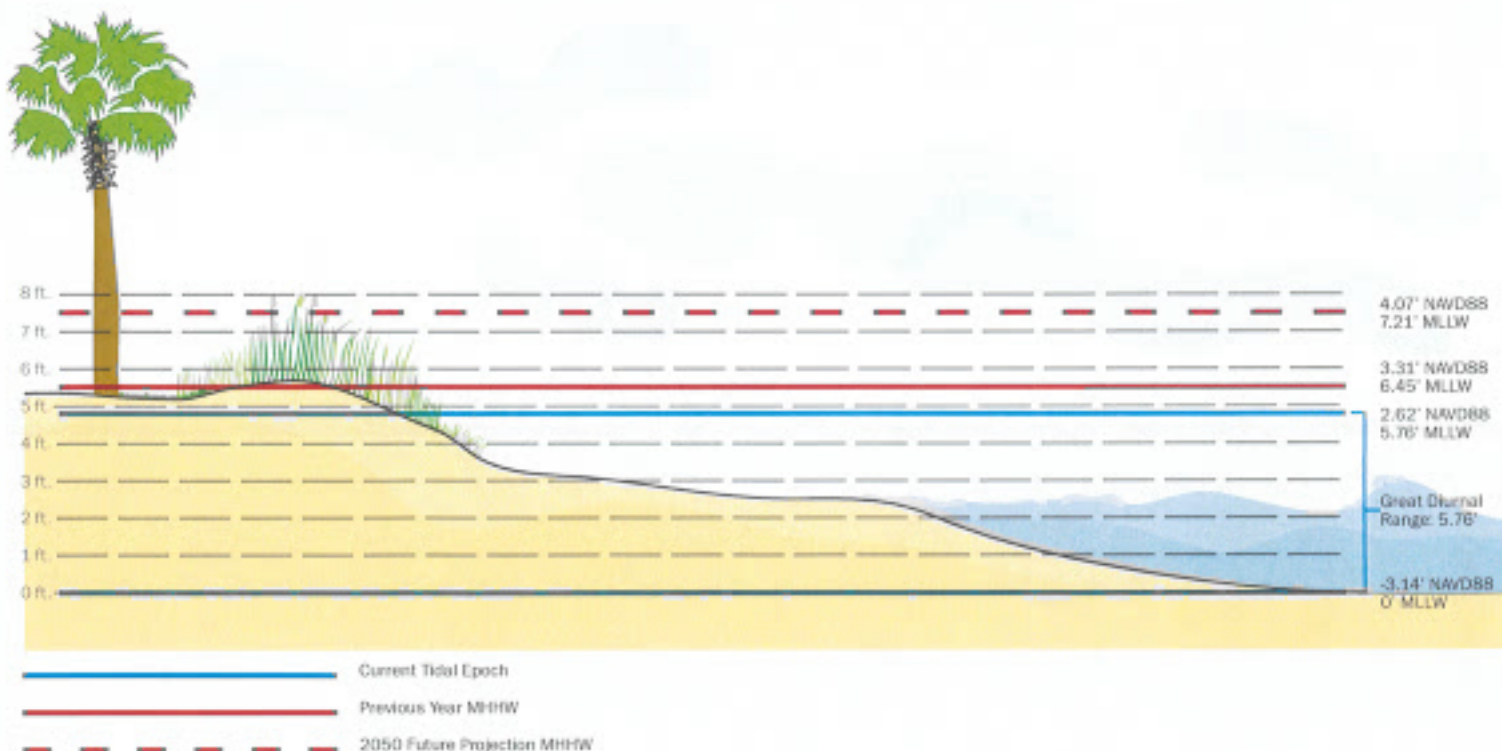
# INTRODUCTION OF TIDAL DATUMS

Tidal datums are the elevation reference used for measuring local water levels and communicating this data to the public. The specific elevation reference used to establish common tidal datums is based on different statistical interpretations of observed tidal data within the most recent tidal epoch, or 19-year observation window. The current established tidal epoch is from 1983 through 2001 and is considered for revision every 20-25 years.

Tidal data is commonly presented as a height relative to Mean Lower-Low Water (MLLW). MLLW is a tidal datum whose reference elevation is set as the average of the daily lowest tide measurements observed during the most current tidal epoch. For example, if it is forecasted that an 8-foot tide will occur, this water level is equivalent to 8 feet above the MLLW reference elevation for a location. Given that the current tidal epoch ended in 2001, an updated tidal epoch and subsequent reference elevations are possible. Therefore, tides expressed in MLLW today may not be equivalent to tides expressed in MLLW in the future.

To provide consistency for this sea level rise adaptation plan and simplify planning and engineering design efforts, tidal data presented herein are benchmarked to a fixed reference of the North American Vertical Datum 1988 (NAVD 88).

For additional information regarding tidal datums please visit the following NOAA webpage: [https://tidesandcurrents.noaa.gov/datum\\_options.html](https://tidesandcurrents.noaa.gov/datum_options.html)



**Figure 2**

Historic and projected tidal datums based on the Charleston Harbor NOAA Station (Station 8665530).

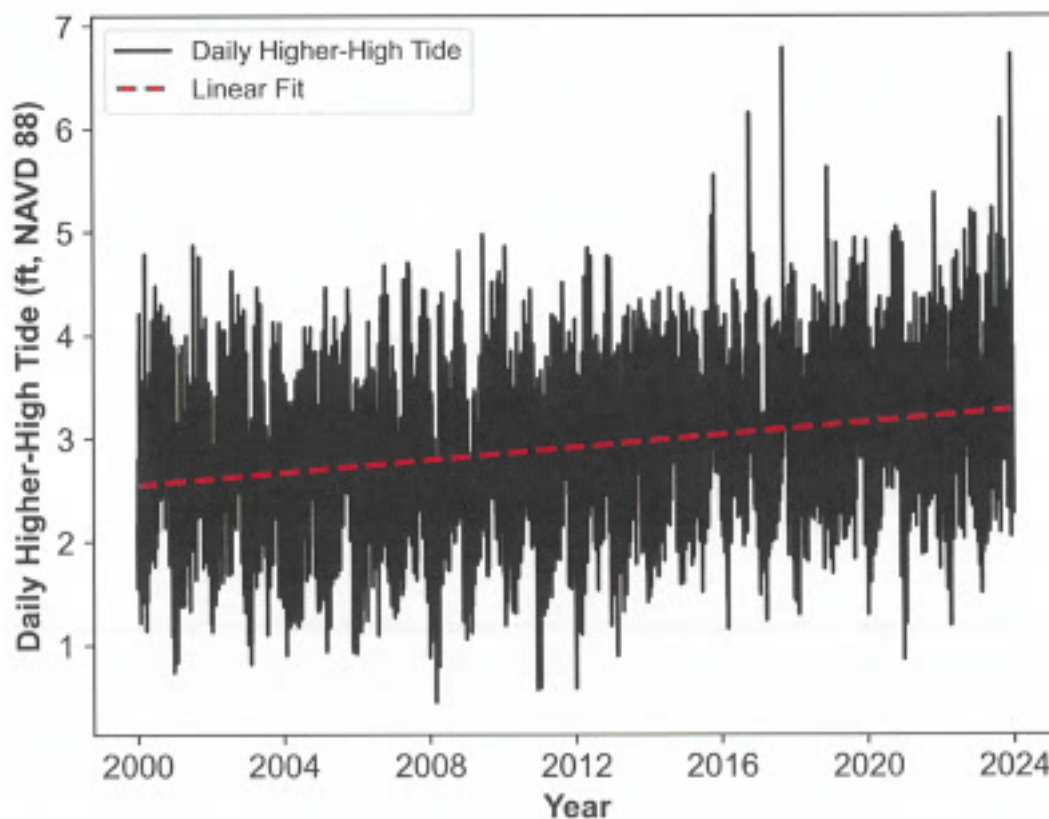
# SEA LEVEL RISE

**A sea level rise analysis was performed to establish baseline tidal conditions and determine the target elevation that the city, planners, and engineers should use as guidance when developing flood mitigation solutions.**

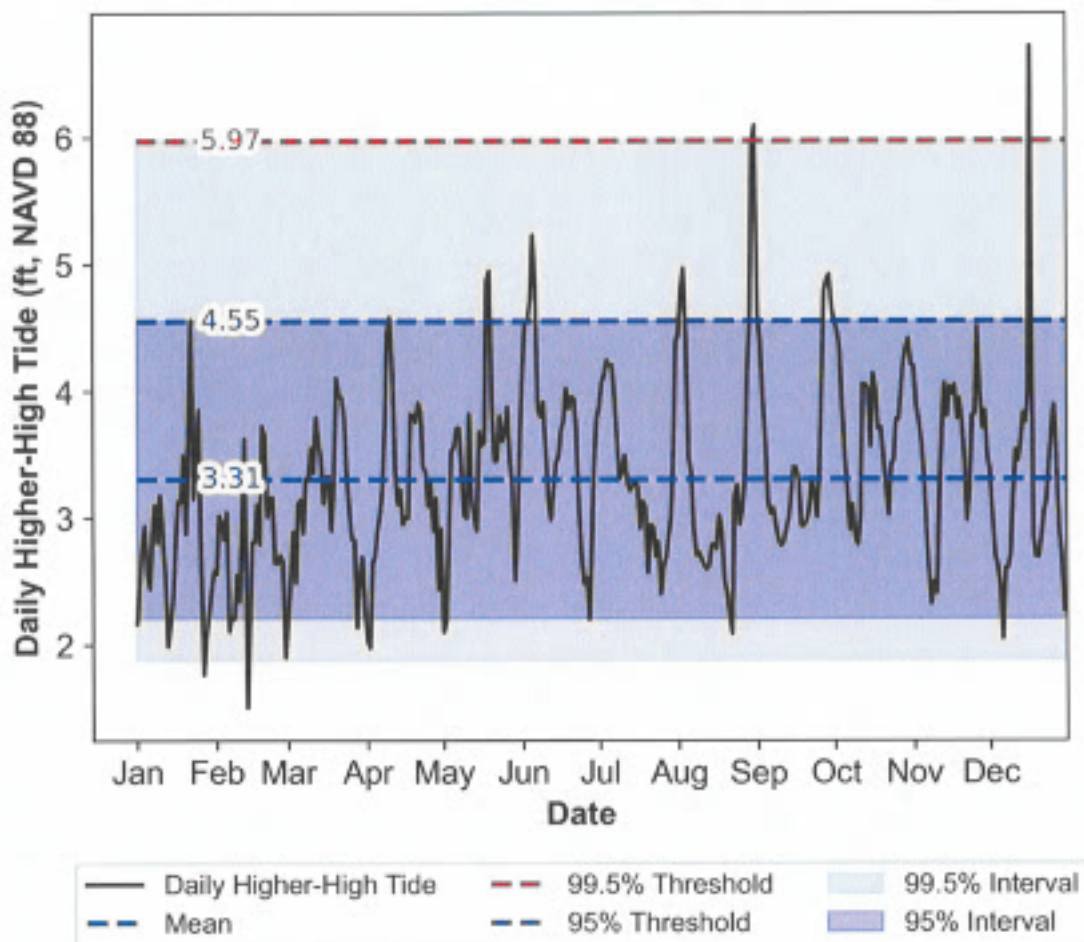
## Baseline Tidal Conditions

The baseline tidal conditions for this analysis were established using observations from the Charleston Harbor NOAA Station (Station 8665530). This station has been collecting high-resolution tidal water level data for several decades over which increases in sea level can be observed (see Figure 3).

The baseline tidal elevation for this sea level rise analysis was based on statistical interpretations of the observed daily higher-high tides for 2023 (see Figure 4). This year represents an excellent baseline for quantifying future sea level rise because: 1) it is the most recent observation year, 2) the mean higher-high tide for the year aligns with long-term data trends, and 3) several extreme tidal events occurred during 2023 with the most extreme occurring outside of a hurricane or tropical storm event. To provide a conservative baseline for providing coastal protection, the 99.5% daily higher-high tide (5.97 ft NAVD 88) for the year 2023 was selected as the baseline tidal elevation for this analysis.



**Figure 3**  
Daily higher-high tide from 2000-2023 for Charleston, SC (NOAA Station ID 8665530) along with a linear fit of the data.



**Figure 4**  
Daily higher-high tide for Charleston, SC (NOAA Station ID 8665530) during 2023 along with quantile thresholds.

### Sea Level Rise Projections

Projections of future sea level rise have been established by the Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force. The projections and scenarios presented by this task force represent the most comprehensive and current (last updated 2022) information when investigating the impact of sea level rise along the U.S. coastline.

Overall, sea level rise projections presented by the task force represent the results of scenarios based on climate models which result in varying levels of risk and probability. For the purposes of this planning document, the intermediate projection for the year 2050 was selected as the sea level rise scenario to determine the local impact of future sea level rise.

For additional information regarding sea level rise scenarios please visit:  
[https://sealevel.nasa.gov/task-force-scenario-tool/?psmsl\\_id=234](https://sealevel.nasa.gov/task-force-scenario-tool/?psmsl_id=234)

## Vertical Land Subsidence

An additional hazard affecting coastal communities is vertical land subsidence, or the rate at which the surrounding landscape is sinking. It is hypothesized that the major contributors to this phenomenon include ground-water extraction and soil compaction in urban areas. Recent research has quantified these rates for the entirety of the U.S. eastern coastline based on vertical land motion data from 2007 to 2020 published by the United States Geological Survey. Analysis of the data points available within the municipal boundary for the City of Isle of Palms concluded that on average the landscape was sinking at a rate of approximately 0.15 inches/year.

For additional information regarding this research on vertical land subsidence please visit: <https://doi.org/10.1093/pnasnexus/pgad426>

## 2050 Sea Level Rise Mitigation Target

The previous datasets were used in the development of a sea level rise mitigation target for the City of Isle of Palms for the year 2050. Based on this analysis, the elevation target to mitigate/protect against future sea level rise is 7 feet NAVD88 (see Table 1; ~10 feet MLLW) which should provide protection for the vast majority of typical tides (excluding hurricanes and/or tropical storm events) experienced in the year 2050.

**Table 1**  
Development of elevation target to mitigate future sea level rise

Individual Components	Value
Current MHHW (2023; 99.5% Threshold)	5.97 feet NAVD88
Projected Sea Level Rise (Intermediate Scenario; Projected 2024 to 2050)	0.763 feet
Vertical Land Subsidence (Average Observed; Projected 2024 to 2050)	0.329 feet
<b>Sea Level Rise Target (2050)</b>	<b>7.061 feet NAVD88</b>

## Sea Level Rise Target (2050) is elevation 7' NAVD88





# VULNERABILITY ANALYSIS

To assist planning efforts of potential mitigation projects, a vulnerability analysis was performed to identify impacted critical infrastructure and areas at-risk of tidal flooding.

This vulnerability analysis was performed using a 2D HEC-RAS model developed to simulate overland flow processes and the island's response to tidal-driven flooding. Several tidal boundary conditions were analyzed within this analysis representative of the tidal elevations for the years 2023, 2030, 2040, and 2050 (developed using the previously discussed methodology; see Table 2) to allow this analysis to identify which areas/infrastructure would be most immediately impacted.

Each tide cycle was developed based on an idealized tide cycle with a frequency of 12.5 hours wherein the peak and amplitude were determined using the MHHW (2.62 feet NAVD 88) and MLLW (-3.14 feet NAVD88) tidal values from the Charleston Harbor NOAA Station (Station 8665530) and shifted vertically to match the peak tide elevation for each target year.

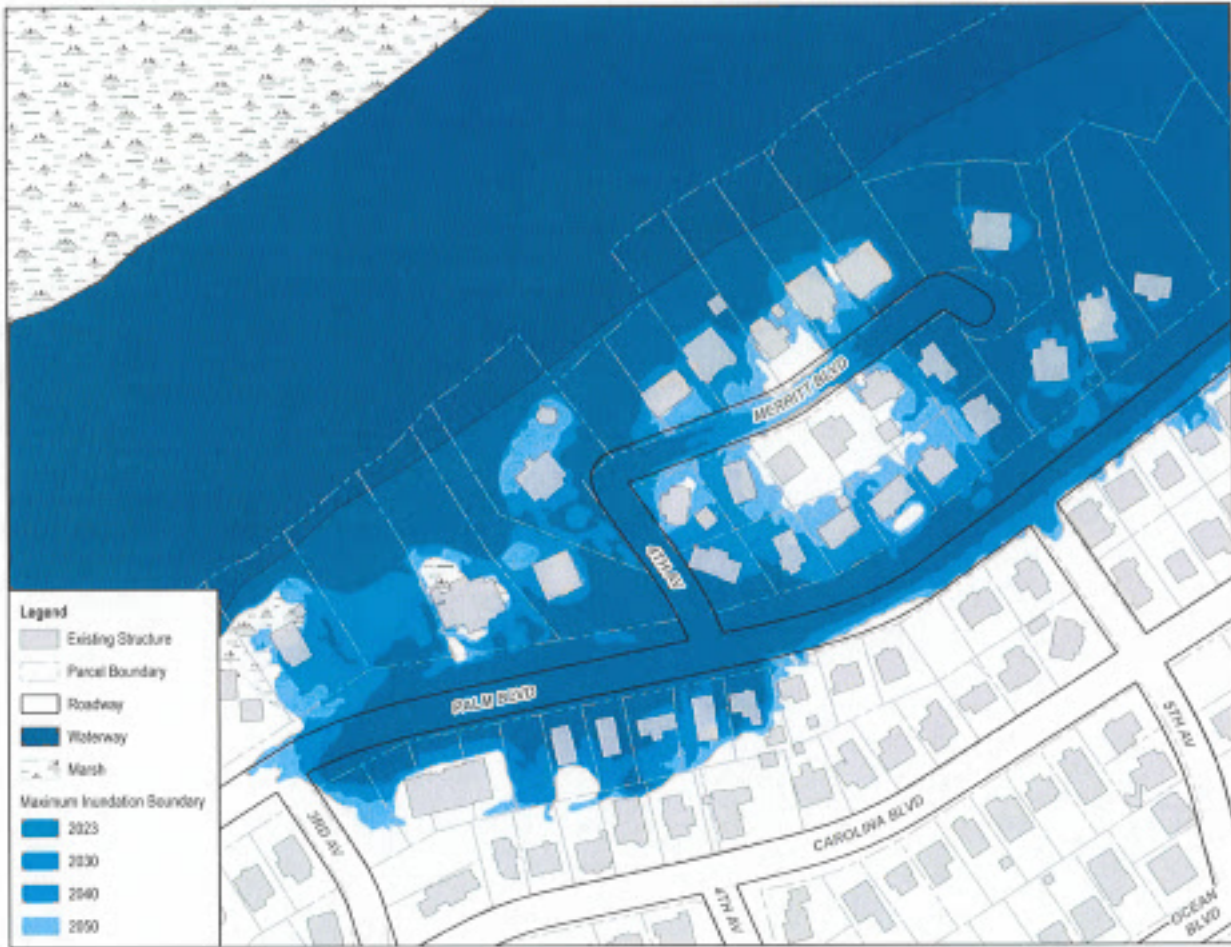
**Table 2**  
Development of additional elevation targets used to develop tide cycles for the vulnerability analysis.

Target Year	Individual Components	Value
2023	Current MHHW (2023; 99.5% Threshold)	5.97 feet NAVD88
	Projected Sea Level Rise	N/A
	Vertical Land Subsidence	N/A
	Sea Level Rise Target (2023)	5.97 feet NAVD88
2030	Current MHHW (2023; 99.5% Threshold)	5.97 feet NAVD88
	Projected Sea Level Rise (Intermediate Scenario; Projected 2024 to 2030)	0.153 feet
	Vertical Land Subsidence (Average Observed; Projected 2024 to 2030)	0.076 feet
	Sea Level Rise Target (2030)	6.199 feet NAVD88
2040	Current MHHW (2023; 99.5% Threshold)	5.97 feet NAVD88
	Projected Sea Level Rise (Intermediate Scenario; Projected 2024 to 2040)	0.442 feet
	Vertical Land Subsidence (Average Observed; Projected 2024 to 2030)	0.202 feet
	Sea Level Rise Target (2040)	6.614 feet NAVD88

Post-processing of the results from the vulnerability analysis allowed for maximum flood inundation boundaries to be developed for each tidal scenario. These flood inundation boundaries are useful tools for communicating flood risk at different timescales across the island.

However, it is important to note that due to model limitations inaccuracies in the simulated flood boundaries are possible. For example, the model does not account for recent projects which may mitigate tidal flow paths as well as stormwater networks which through tidal backflow may allow tides ingress further into the island. Therefore, these flood boundaries and results should be considered for planning purposes only. An example of this can be found below in Figure 5 which depicts the results of the vulnerability analysis for an area near the intersection of Palm Boulevard and 4th Avenue.

Please reference Appendix A for the results of this analysis across the entire island.



**Figure 5**  
Example results from the vulnerability analysis near Palm Boulevard and 4th Avenue.

A summary of the impacts at each projection year observed in the vulnerability analysis can be found below in Table 3. Specifically, roadway and parcel (including appraised value and septic/sewer classifications) impact data are tabulated below

Overall, it can be interpreted from these results that the year 2040 is a critical year for the city, with the observed impacts substantially increasing from 2040 to 2050 at a rate greater than any other year-to-year comparison in this analysis.

**Table 3**  
Results from the vulnerability analysis.

Year	Parcels Impacted	Appraised Value of Impacted Parcels (\$million)	Parcels Impacted on Septic	Roadways Impacted (miles)
2023	1041	1415.28	235	3.37
2030	1221	1530.45	289	4.53
2040	1556	1791.70	410	6.95
2050	2011	2115.69	524	13.88

# ADAPTATION STRATEGIES

# ADAPTATION STRATEGIES OVERVIEW



## Policies

- A** Elevated Tide and Emergency Operations Policies
- B** Zoning Ordinance Updates for Redevelopment
- C** Create a Design Tool for Redevelopment
- D** Conduct Water Quality Assessment Plan



## Projects

- A** Infrastructure Maintenance
- B** Grey/ Rigid Infrastructure
- C** Green Infrastructure
- D** Perimeter Protections



## Programs

- A** Incentivizing Private LID Stormwater Management
- B** Purchasing or Conservation of Flood Prone Property
- C** Educational Programs
- D** Create a Demonstration Rain Garden

# POLICIES

## **A Elevated Tide and Emergency Response Program**

The City can adopt an operations policy to address storm surges and elevated seasonal tides as they happen more frequently. This policy should address:

- Advanced warning timeline strategy of when to inform the public and when to require public action as needed (evacuation, road closures, etc.)
  - Timeline and implementation of barricades and signage for public safety
  - Coordination with other agencies and municipalities
  - Debris cleanup following a storm event
- 

## **B Zoning and Building Ordinance Updates for Redevelopment**

As growth continues on Isle of Palms, it is imperative that the City Zoning Ordinance modify to require new development and redevelopment to meet the impacts of sea level rise and increased flooding.

Updates to the Zoning Ordinance in addition to what exists in the City Ordinance may include:

- On all new development and any redevelopment, an engineer must review and sign off on grading plan and drainage report to ensure compliance
- Development to prioritize routing runoff to adjacent drainage infrastructure (where applicable) within the right-of-way
- Increase volume/flow offset for stormwater
- Increase allowed fill on developed parcels that fall under the projected sea level rise plan elevation target
- Prohibiting new septic fields/tanks on sites where there is an available sewer tie-in or on parcels that are lower than elevation 7' NAVD88
- Increase setbacks on septic fields to the OCRM critical line and areas prone to flooding
- Limit/restrict new development in flood prone areas
- Maintain and strengthen marsh setbacks and add elevation considerations in setback requirements
- Increase tree canopy requirements to help better stabilize soil and slow the rate of runoff. Currently, the only required tree planting in the zoning ordinance is in the buffer yard requirements for commercial properties. This planting requirement should be expanded to required interior parcel tree planting for commercial and residential properties as well as required tree save minimums.
- Tree replacement for removal of historic trees currently requires half the DBH caliper inches of the removed tree. The replacement requirement can be increased up to the entire DBH in caliper inches to help restore a stabilizing root system and further deter the unnecessary removal of historic trees.
- Clarify the code to better define pervious paving. Sec. 5-4-13 (c) states that all newly installed hardscape elements be pervious, but does not define (or limit) what those materials are.
- Restrict the construction of bulkheads or revetments on the marsh side of the island. In February 2024, the City passed an emergency ordinance allowing property owners to erect protective bulkheads on beach front property between 100 and 914 Ocean Blvd. That allowance should not extend to the marsh fronting properties as bulkheads can cause long term erosion and degradation of the marsh ecosystem. Instead, fill or vegetated berms outside of the critical area should be considered to provide adequate tidal protection.

# PROJECTS

## A Grey/Rigid Infrastructure

Built infrastructure can help capture, store, and control storm and tidal water through improvements to the stormwater systems.

- **Upgrading and replacing pipes** to increase flow capacity and ensure positive drainage
- **Installing tide gates** on stormwater outfalls to prevent tidal backflow through stormwater networks.
- **Providing underground storage** to increase storage capacity during events.
- **Transitioning properties** to sewer will reduce risk of contamination during flood events.
- A **Dune Infiltration System** is a type of underground detention that relies on the naturally high infiltration capacity of dunes to store and treat storm water.



Check valves on marsh outfall



Improved drainage structure



Increase storm pipe size and structure



Dune infiltration system



Beach renourishment at Breach Inlet



Cleaned and reinforced existing ditch in the right-of-way

## B Infrastructure Maintenance

Maintenance and upkeep of existing systems will help mitigate flooding impacts by restoring existing systems.

- **Cleaning and upkeep** of public storm drains, pipes, ditches, and swales. This effort can come from the ongoing drainage master plan and public feedback of clogged utilities. This will require coordination with SCDOT if infrastructure lies within a right-of-way.
- **Continue beach renourishment** efforts the City has ongoing to add sand and restore dunes to bolster the resiliency of the beach

# PROJECTS

## C Green Infrastructure

Using low impact development projects, the City can mitigate increased flooding and sea level rise using more natural and less invasive practices. Many of these strategies also create a more planted and aesthetically interesting space.

- **Living shorelines** reinforce marsh and coastal shorelines by decreasing bank slope and using natural materials to not only help mitigate damage from flooding and erosion, but re-create and bolster a natural ecosystem. These living materials can range from native plants, oyster beds and shell bags, coir logs (biodegradable coconut fiber), rocks and any combination of those elements. (Note that riprap is prohibited as beach erosion control method per City zoning ordinance). Living shorelines are created at or below the critical line.
- **Marsh management** is one of the most critical aspects to combating sea level rise on Isle of Palms as the most impactful tidal flooding comes through the Intracoastal Waterway marsh. The City can prepare a study and plan that establishes concerns with sea level rise and increased flooding impacts on the marsh ecosystem and recommendations to monitor, protect, and restore the marsh as necessary. This study can provide site specific solutions and implementation strategies, which may include living shoreline strategies.
- **Creating bioswales and rain gardens** in the right-of-way and public space can utilize space that is either empty and/or prone to flooding to capture runoff. Both of these strategies will require native planting to slow the flow of runoff and stabilize from erosion. Low maintenance species should be selected.



Living Shorelines



Living Shorelines



Marsh Management



Right-Of-Way Bioswale

# PROJECTS

## D Perimeter Protection

As Isle of Palms is a barrier island, protecting its edges from flooding and sea level rise will be critical to its long term resiliency.

- **Raising Waterway Boulevard** to elevation 7' NAVD88 will provide a barrier for the interior of the island against tidal flooding from the Intracoastal Waterway, as most of flooding comes through the ICW.
- In addition to the ongoing dune restoration project on the south end of the island, further **dune/beach renourishment projects** can happen along the beach front. The placing and shaping of the new sand will help protect the beach from further erosion and serve as a physical barrier from the beach and inland areas.
- **Building inland berms** can provide flooding protection in site specific applications.



Waterway Boulevard



Berm on Pawley's Island



Dune renourishment efforts at Ocean Isle Beach, NC





# PROGRAMS

## A Purchasing Flood Prone Property

As grant funding becomes available, properties that continuously flood could be considered for land acquisition. Once acquired, they can be utilized as open green spaces that host flood mitigation projects.

## B Incentivizing Private LID Stormwater Systems

Property owners can help overall water management through the implementation of strategies on their properties. Using tax credits, water and utility rebates, group purchasing, and other incentives, the City can encourage property owners to install and maintain LID stormwater projects to manage on-site stormwater. These strategies can help alleviate the volume of stormwater the City's storm system captures during storm events and help stabilize the soil to reduce erosion. The City can create a points system that allows for greater benefits with more strategies a private homeowner achieves.

Examples of the LID strategies can include:

- Rain gardens
- Bioswales
- Replacing lawn with native planting
- Rain cisterns
- Increased tree canopy
- Green roof installation



Rain Gardens with Cistern



Bioswales



Replacing sod with native planting



Rain Cisterns



Tree canopy to stabilize soil



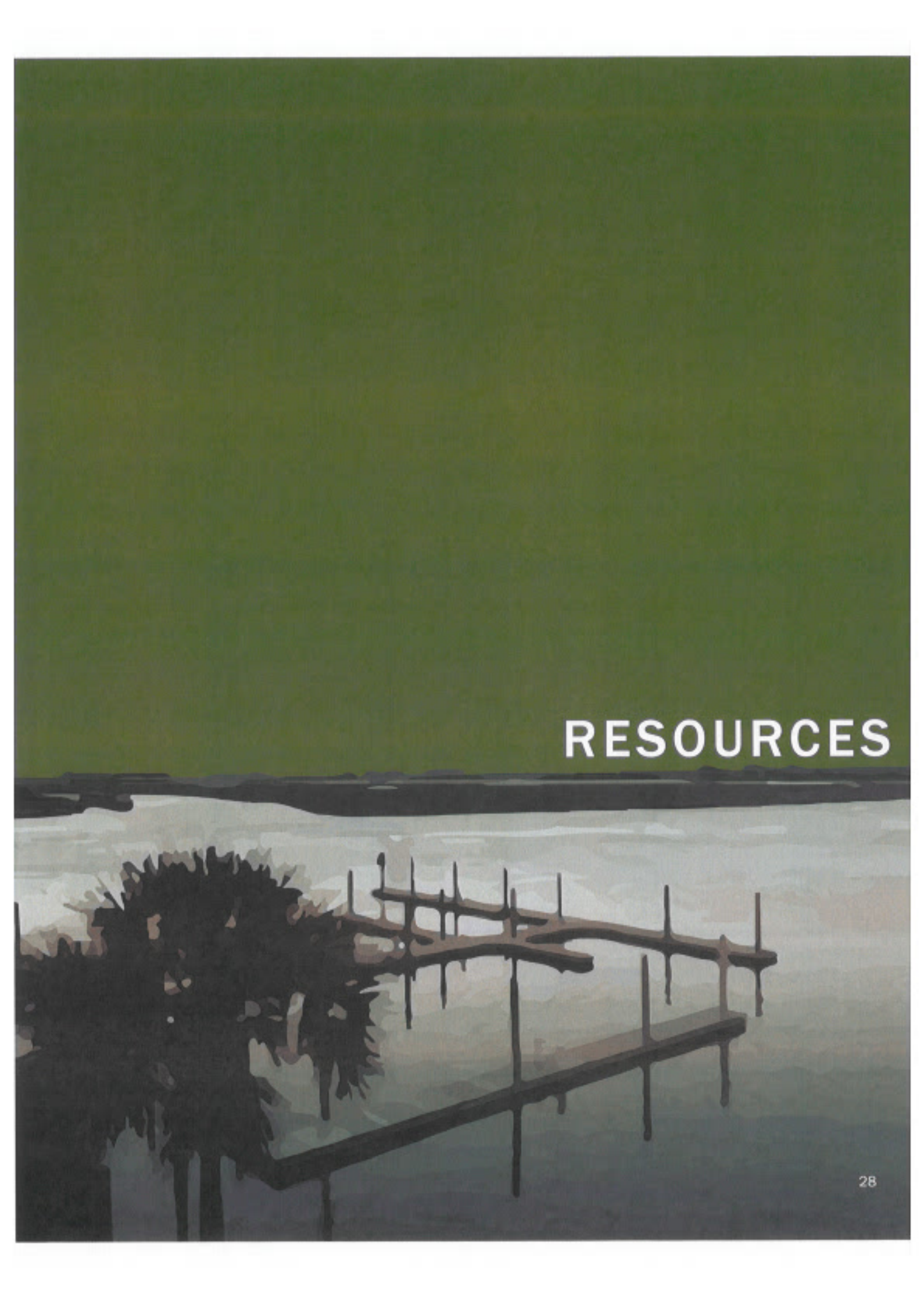
Green roof installation on Kiawah

A photograph of a wooden boardwalk leading to a beach. The boardwalk is made of light-colored wood and has a simple railing. It leads from the foreground towards a sandy beach where many birds are gathered. The sky is a clear, pale blue. The overall scene is bright and open.

# MOVING FORWARD

IMPLEMENTATION

**THIS SHEET INTENTIONALLY LEFT  
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A stylized illustration of a coastal scene. The top half of the image is a solid dark green color. Below this, a dark, silhouetted horizon line separates the sky from the water. The water is rendered in shades of light blue and white, with a wooden pier extending from the foreground into the water. The pier is made of dark brown planks and has several vertical posts. In the foreground on the left, there are several palm trees with dark, spiky fronds. The overall style is minimalist and graphic.

# RESOURCES

# RESOURCES

## **Sea Level Rise Viewer**

<https://coast.noaa.gov/slr/>

## **Tidal Datums**

[https://tidesandcurrents.noaa.gov/datum\\_options.html](https://tidesandcurrents.noaa.gov/datum_options.html)

## **Charleston NOAA Tide Gauge**

<https://tidesandcurrents.noaa.gov/waterlevels.html?id=8665530>

## **Sea Level Rise Projections**

[https://sealevel.nasa.gov/task-force-scenario-tool/?psmsl\\_id=234](https://sealevel.nasa.gov/task-force-scenario-tool/?psmsl_id=234)

## **Vertical Land Subsidence**

<https://doi.org/10.1093/pnasnexus/pgad426>

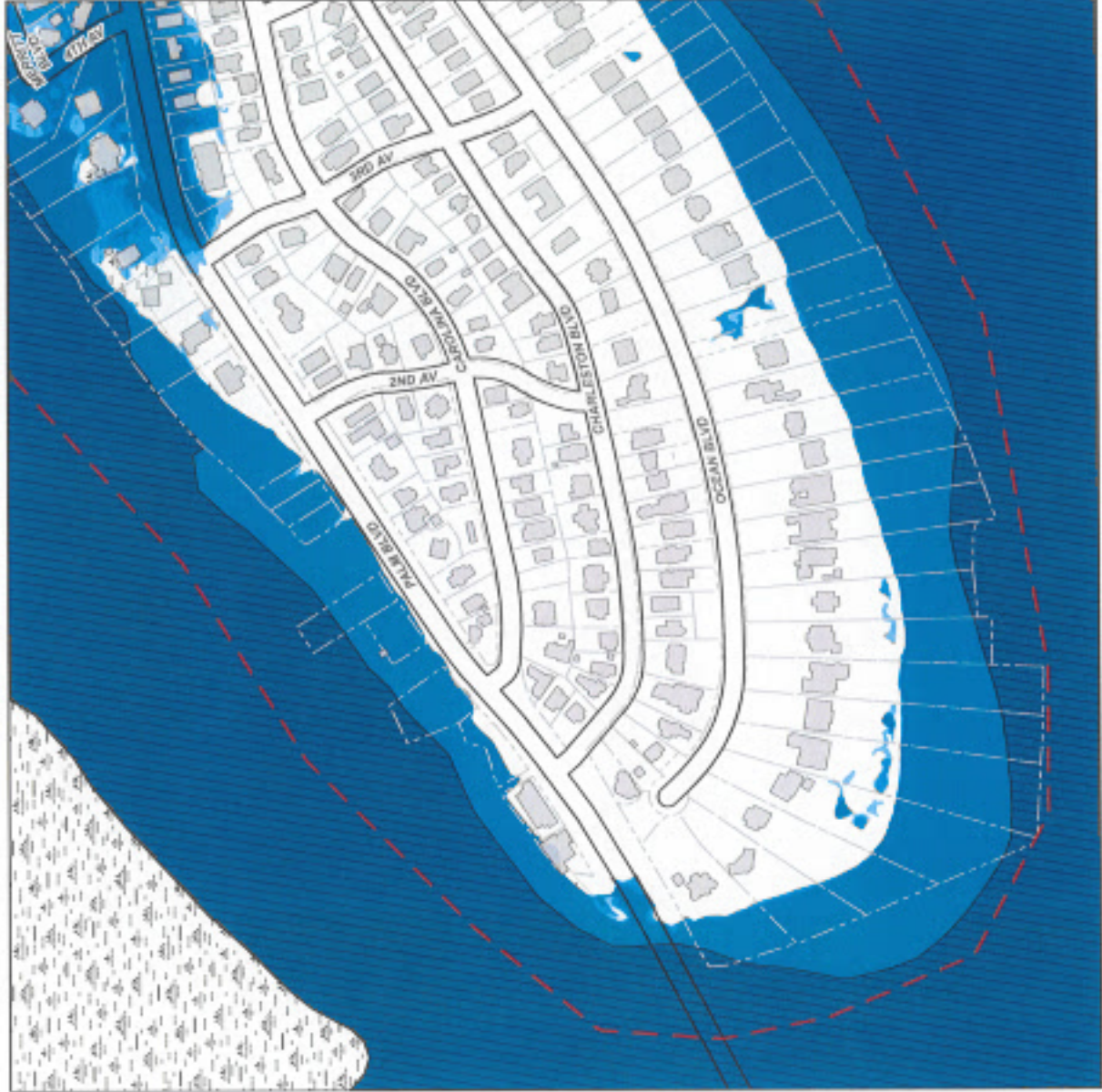


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood inundation and results of this analysis should be considered for planning purposes only; inaccuracies are possible due to model limitations.
6. These results do not account for the impact of outside-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary
  - 2023
  - 2030
  - 2040
  - 2050



City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis

Appendix A

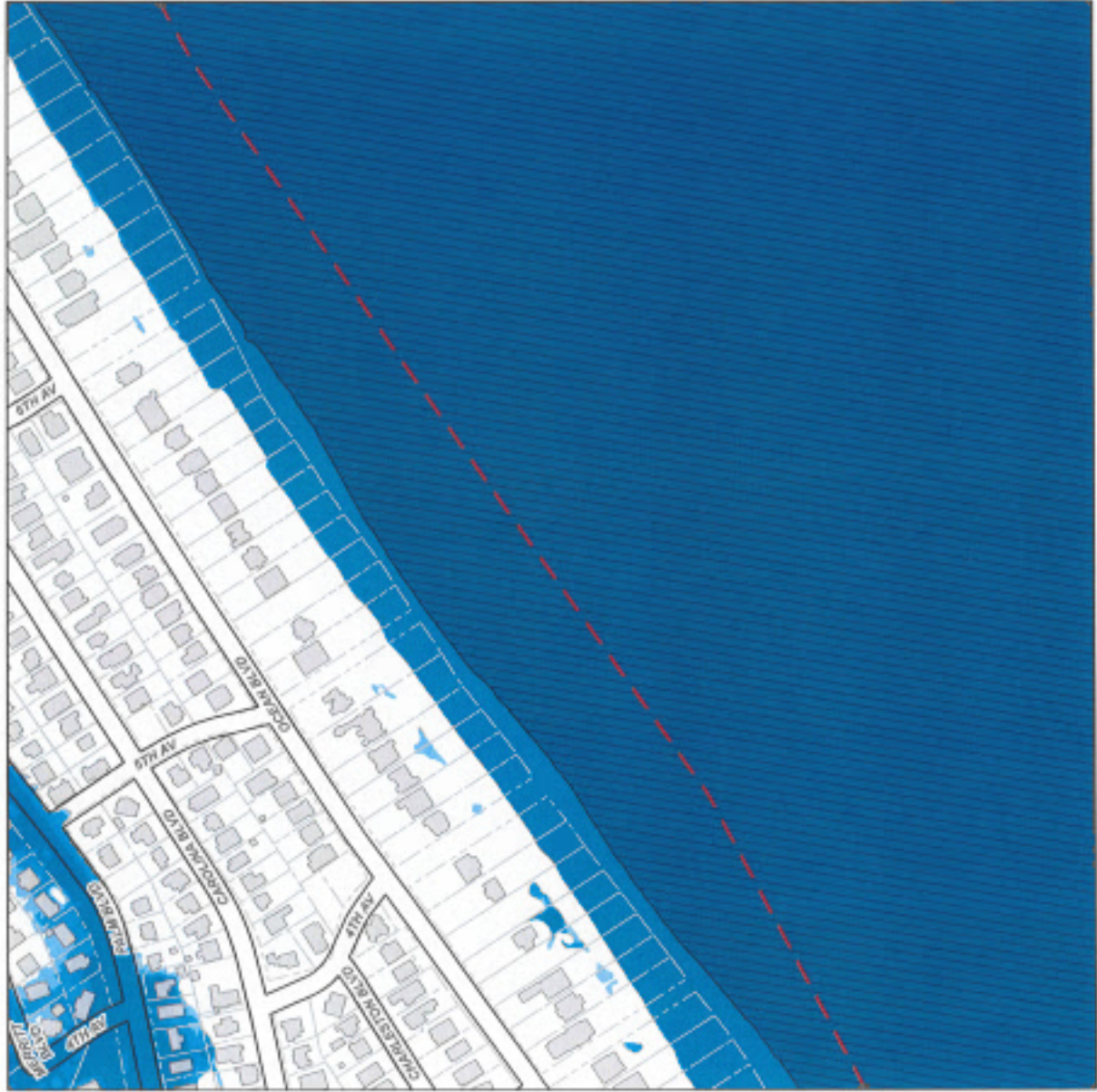
Sector A2

Page 2 of 30



NOTES:

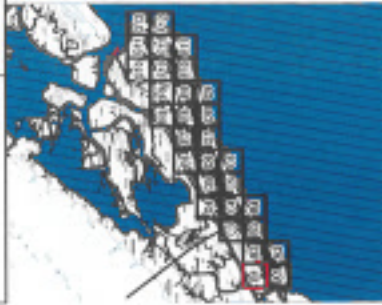
1. Flood inundation boundaries created using a 2D IEC-HUCE model of the study area.
2. Tidal boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk of foundation boundary exceed parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of weather-driven flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



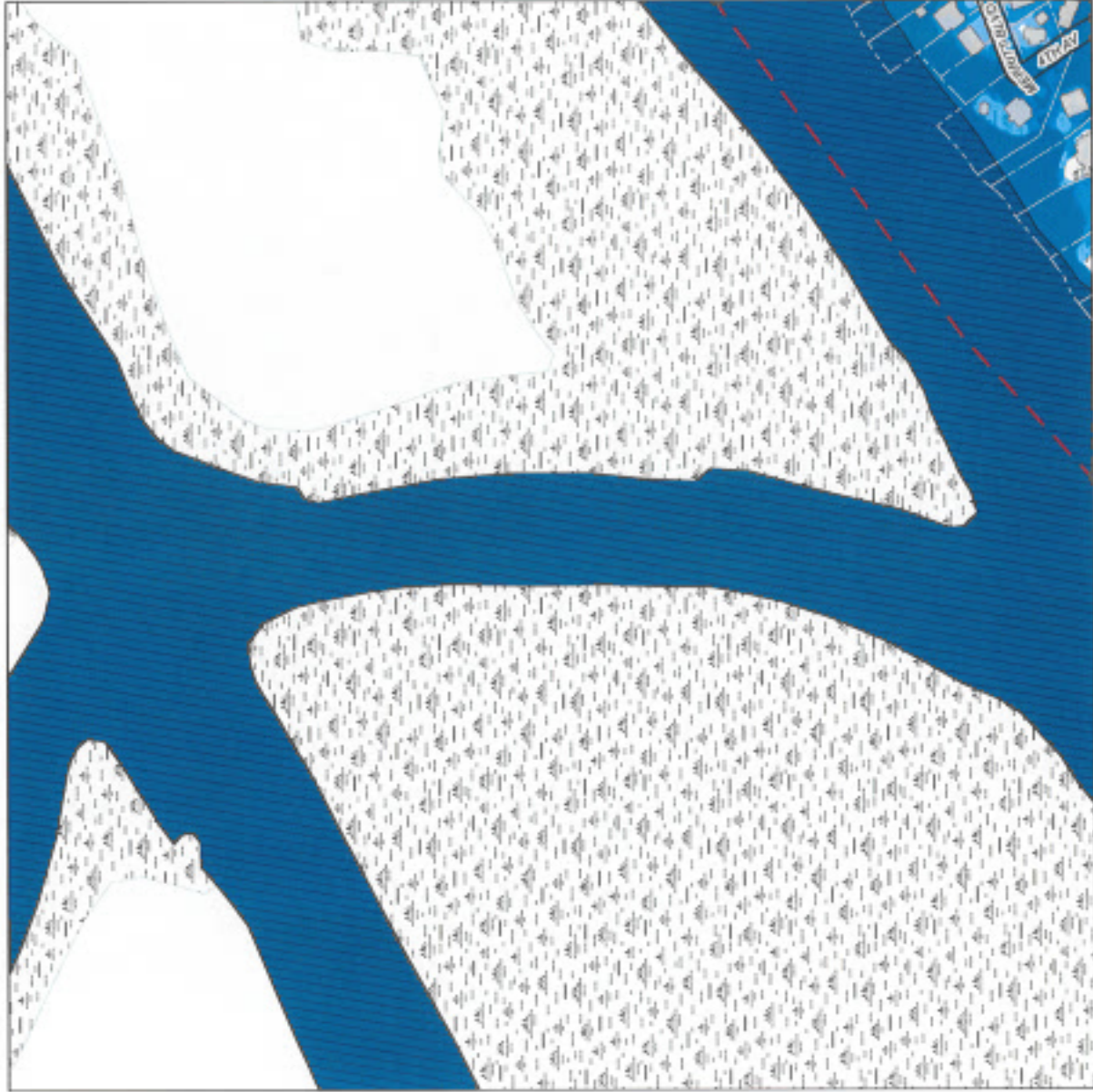


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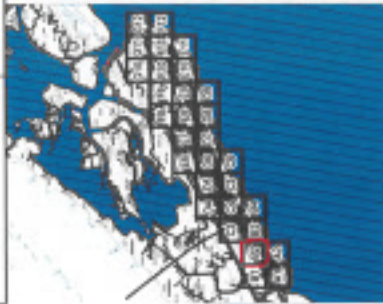
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only; inaccuracies are possible due to model limitations.
6. These results do not account for the impact of rainfall-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





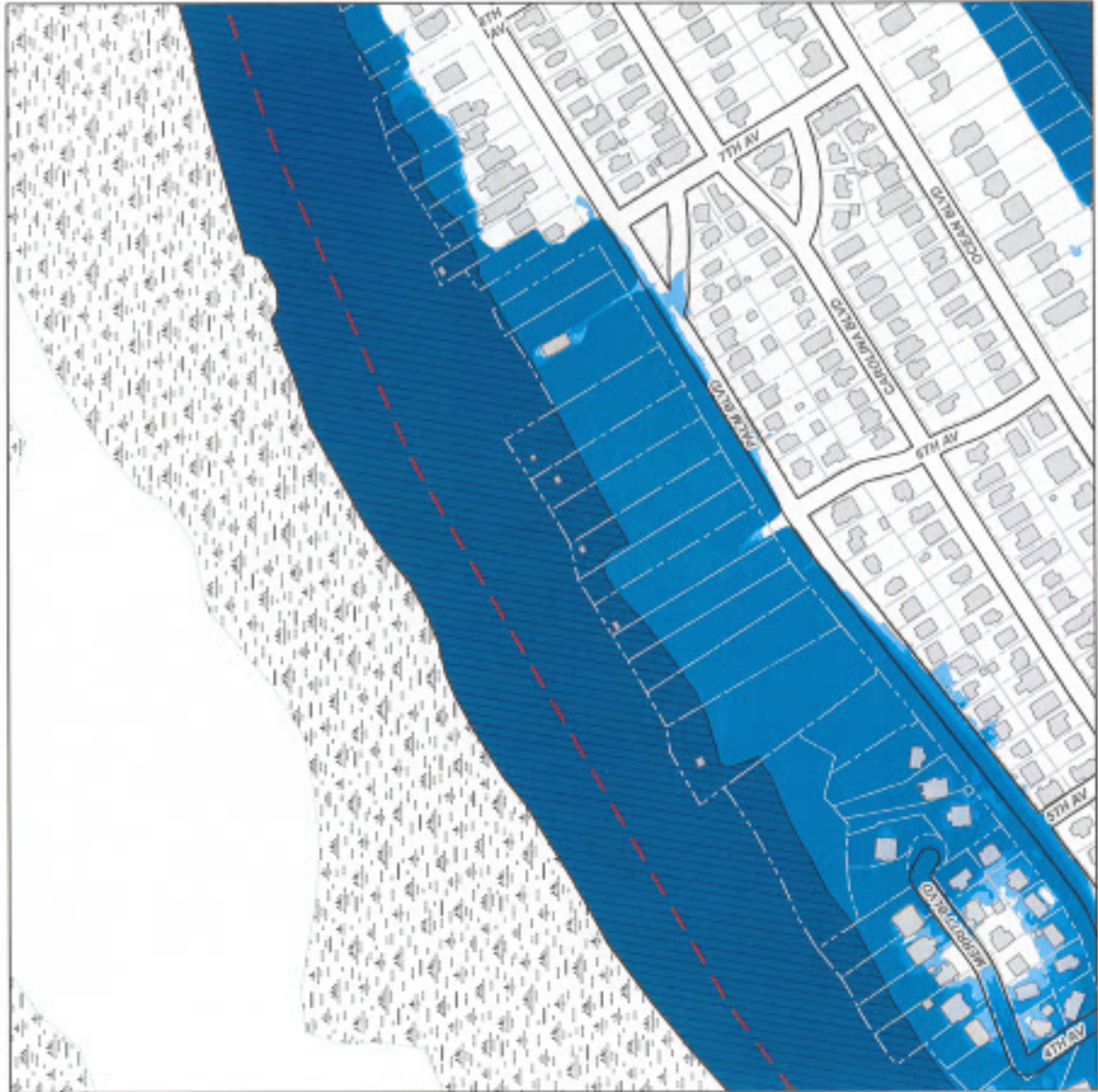


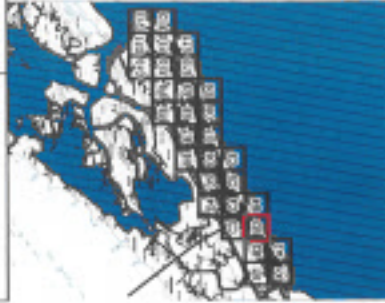
NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Tide boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of wind-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Mitigation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk of inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Accuracies are possible due to model limitations.
6. These results do not account for the impact of rainfall-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis

Appendix A

Sector B4

Page 6 of 30



NOTES

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk of foundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inundations are possible due to model limitations.
6. These results do not account for the impact of rainfall-driven flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



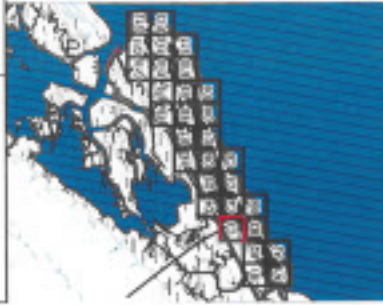
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis

Appendix A

Sector C3

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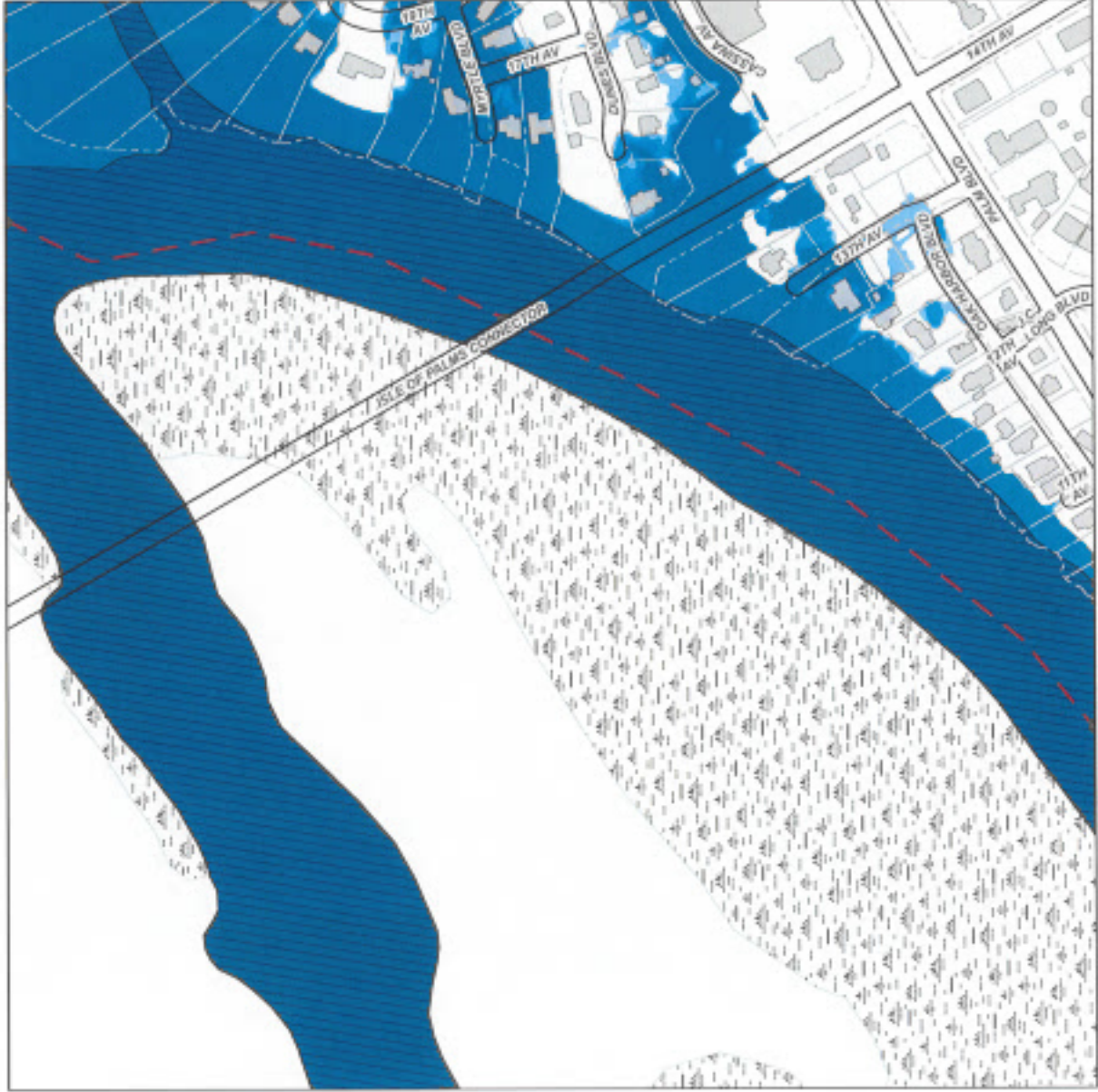


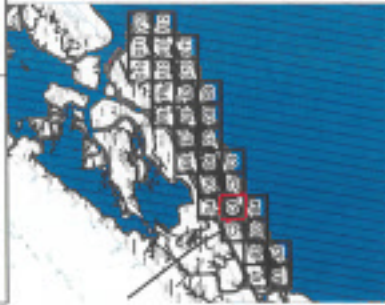
NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of rain-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary
  - 2023
  - 2030
  - 2040
  - 2050



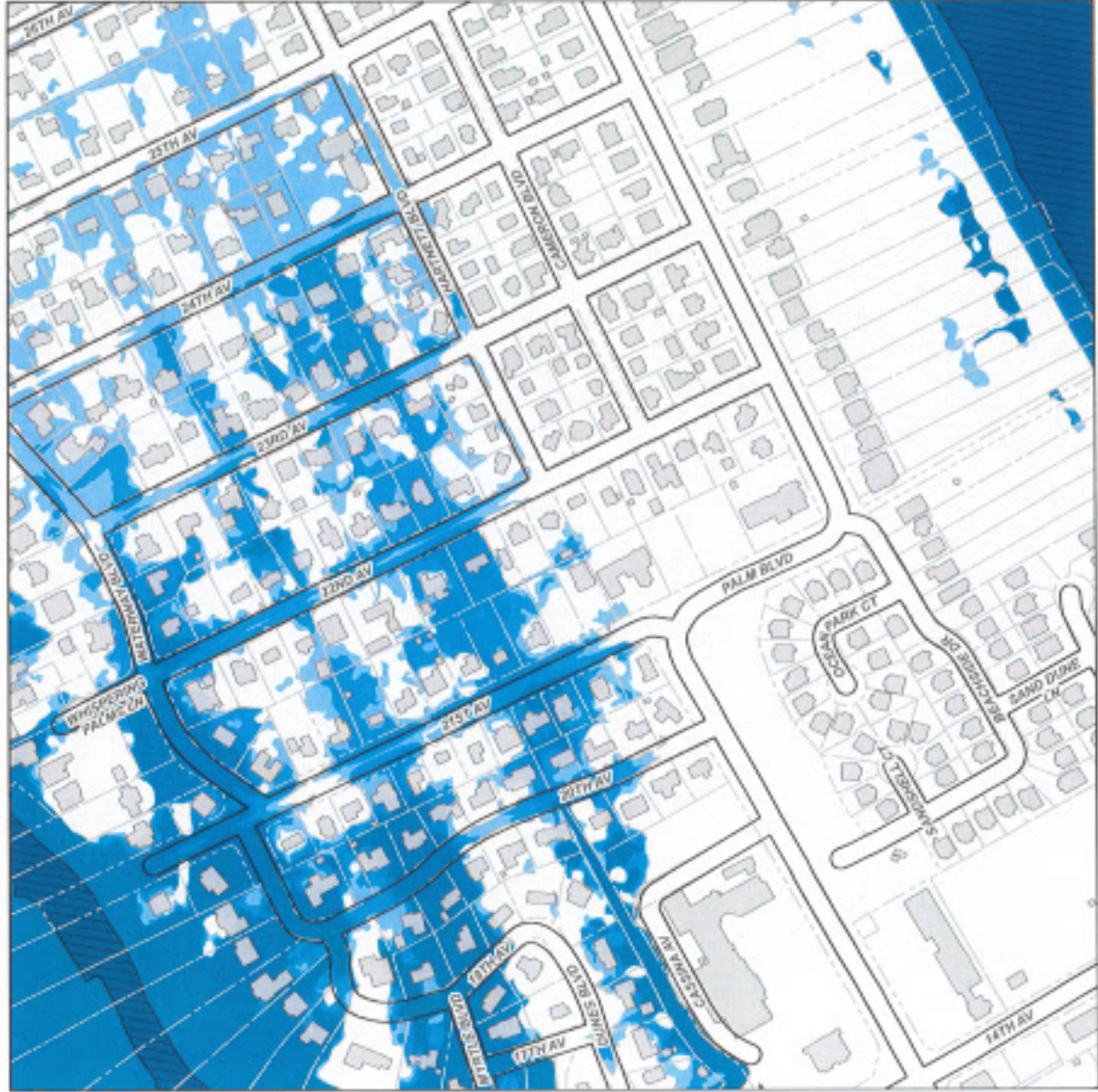


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries created were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary locations are approximate.
4. Pavels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of variable-tide flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



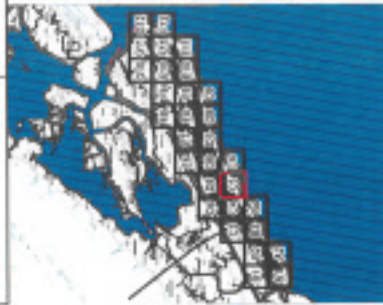
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis

Appendix A

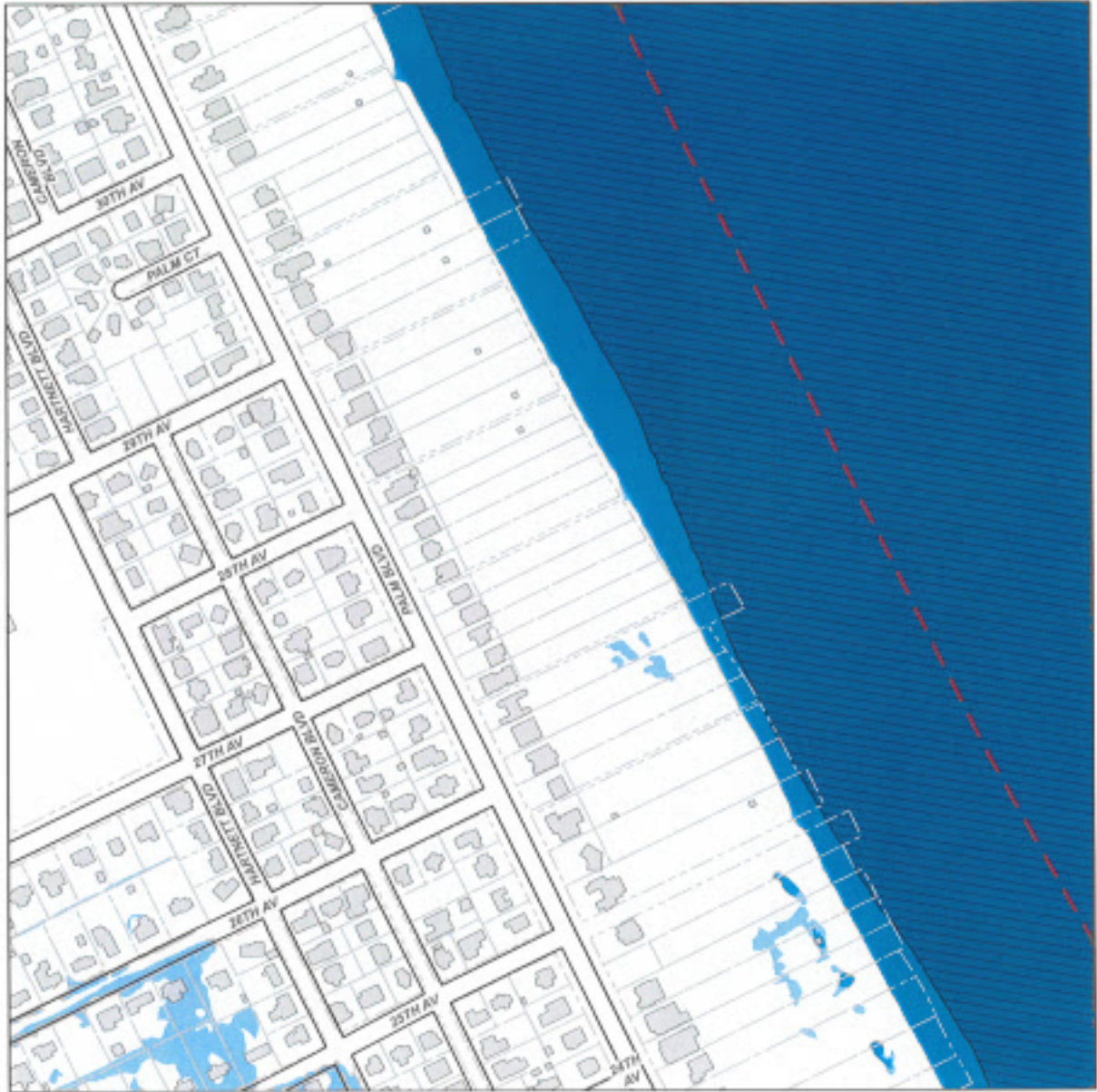
Sector C5

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NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Tidal boundaries were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of nearby street flooding.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Roadway
- Waterway
- Marsh
- Maximum Inundation Boundary
- 2023
- 2030
- 2040
- 2050



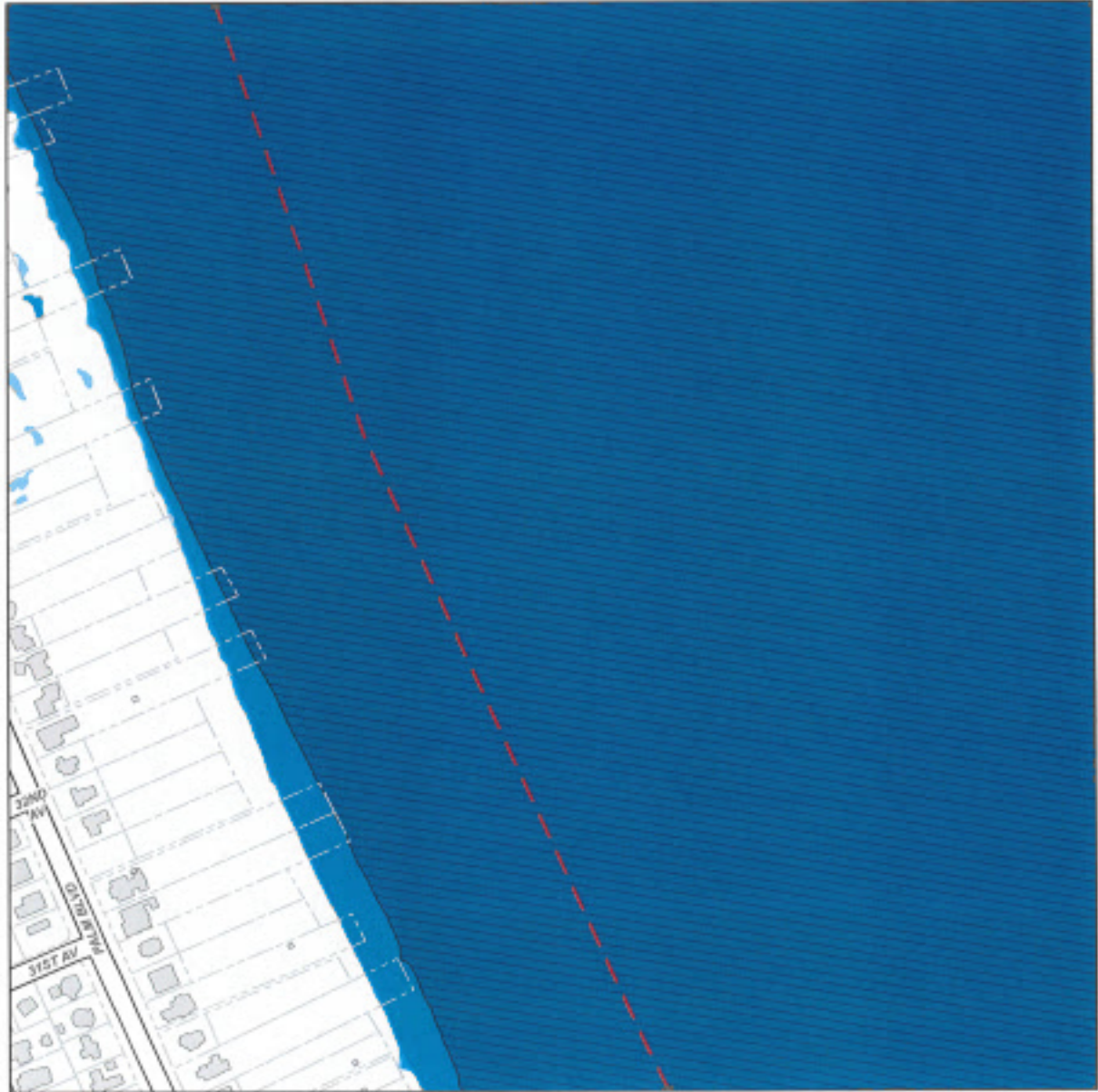


NOTES

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total inundation conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of rainfall-driven flooding.

Legend

-  Study Boundary
  -  Existing Structure
  -  Parcel Boundary
  -  Roadway
  -  Waterway
  -  Marsh
- 
-  Maximum Inundation Boundary
  -  2023
  -  2030
  -  2040
  -  2050



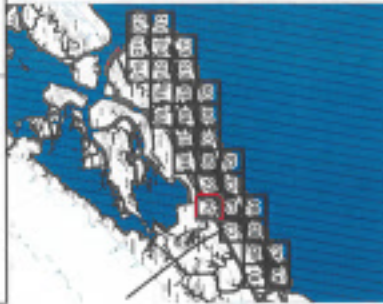
City of Isle of Palms, South Carolina  
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Sector D4

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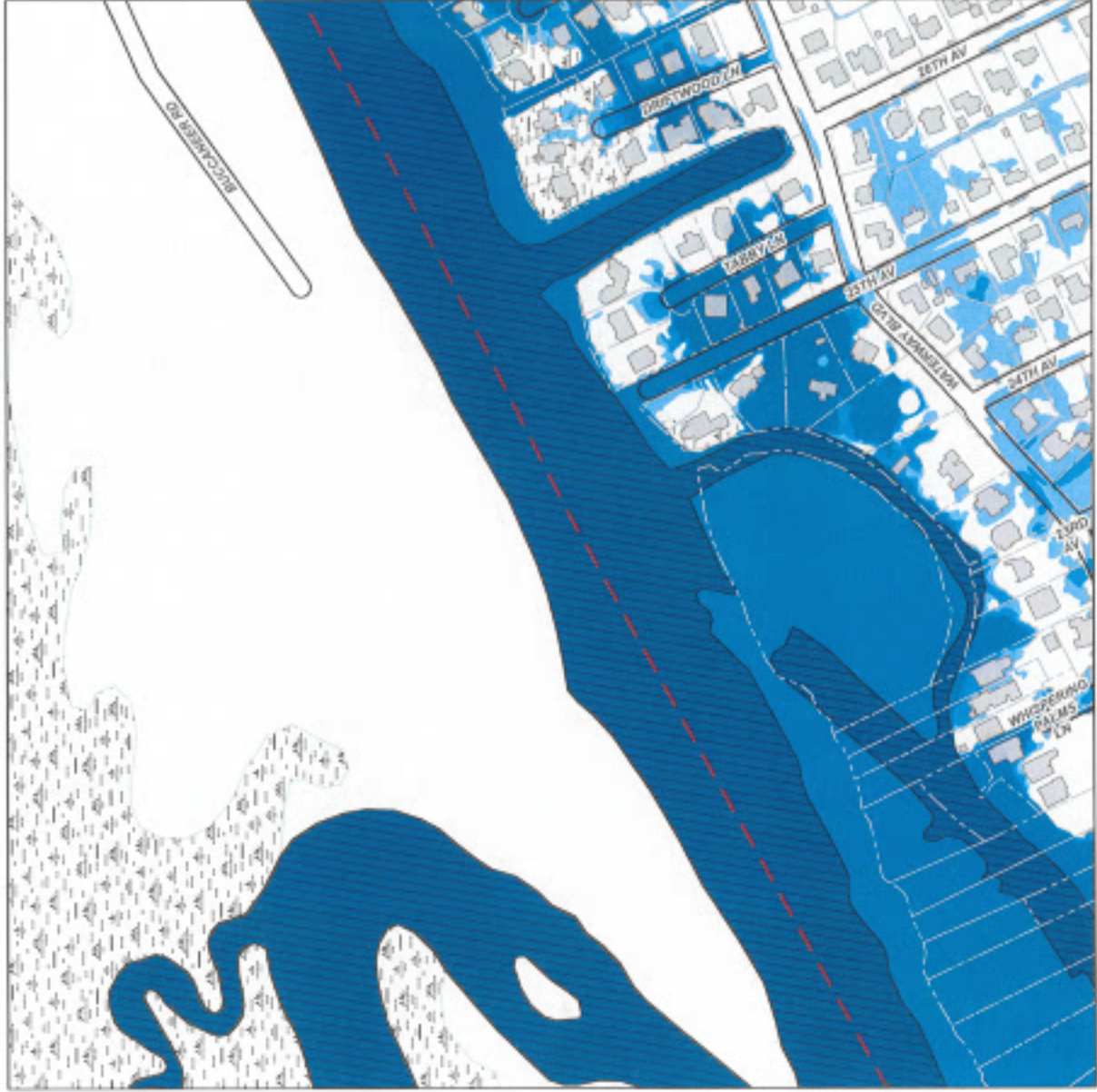


NOTES

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Migration Plan).
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inundation are possible due to model limitations.
6. These results do not account for the impact of catchment-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





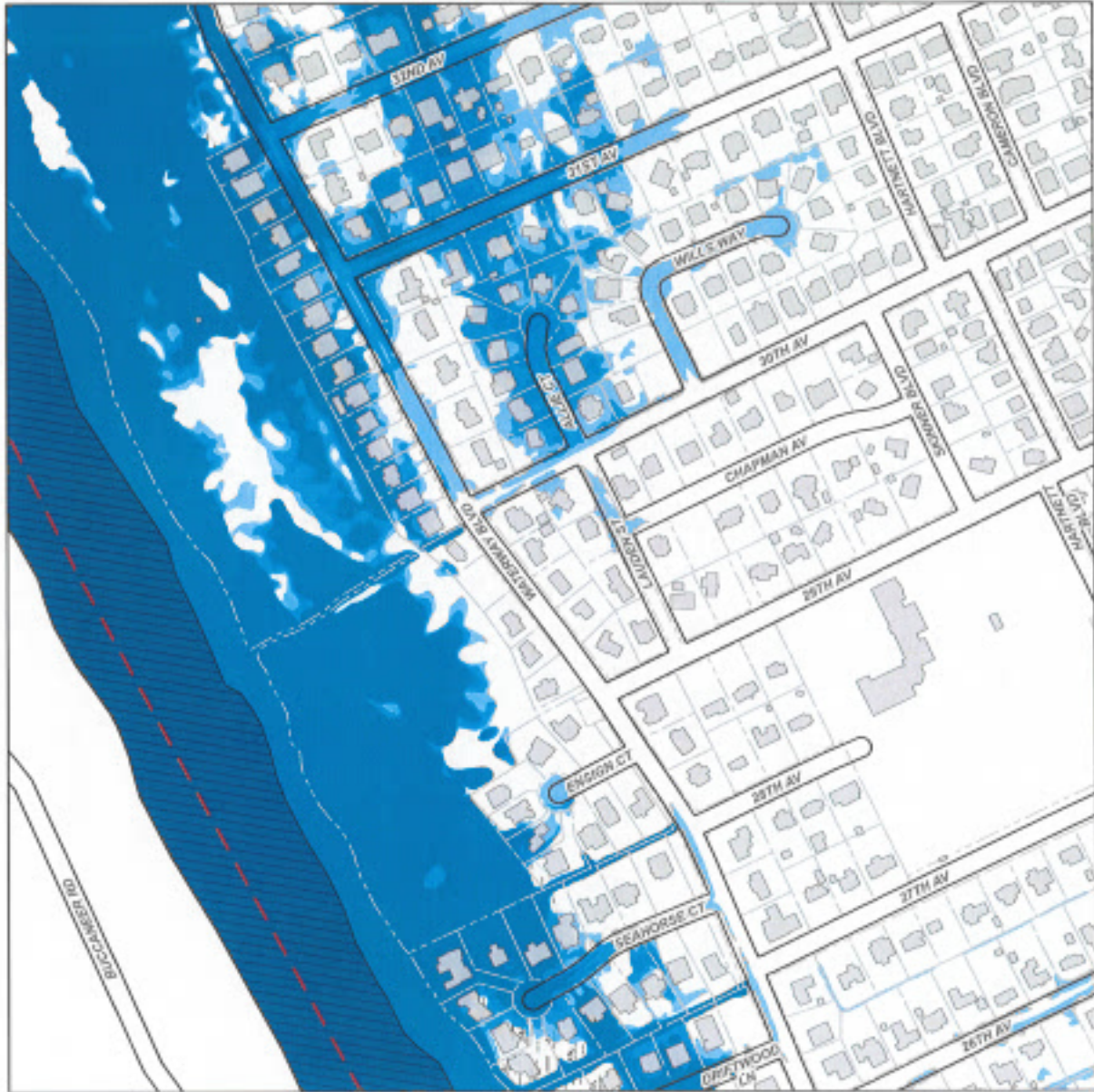


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk if foundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only; inaccuracies are possible due to model limitations.
6. These results do not account for the impact of variable driver flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



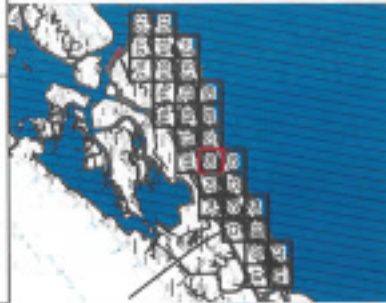
City of Isle of Palms, South Carolina  
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Appendix A

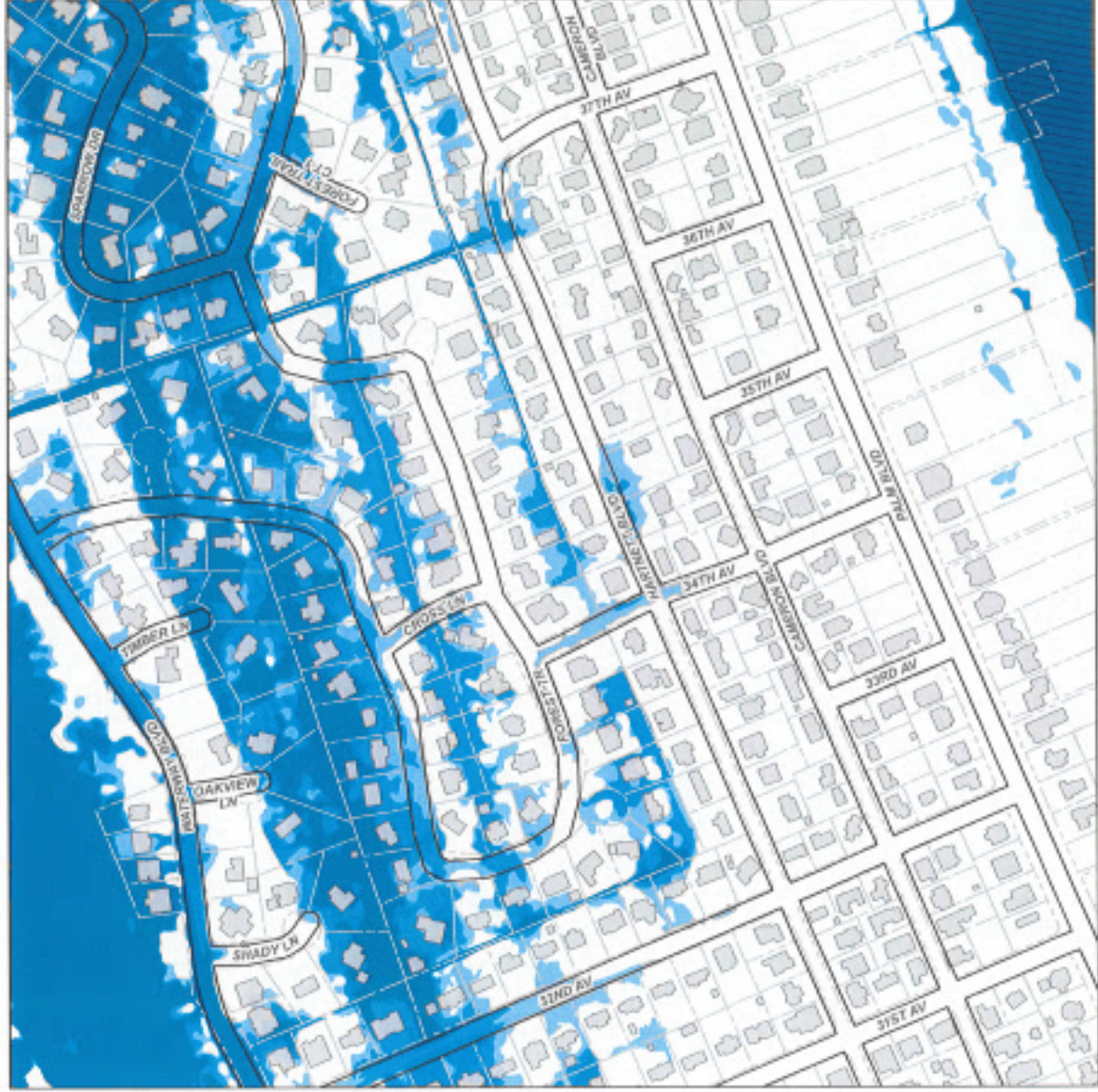
Sector D6

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NOTES:

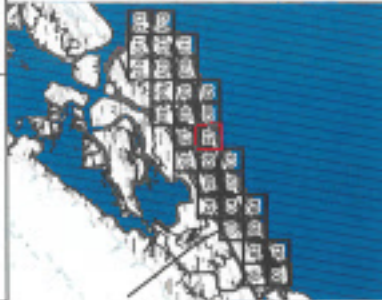
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary revisions are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Measurements are possible due to model limitations.
6. These results do not account for the impact of vertical-draw flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



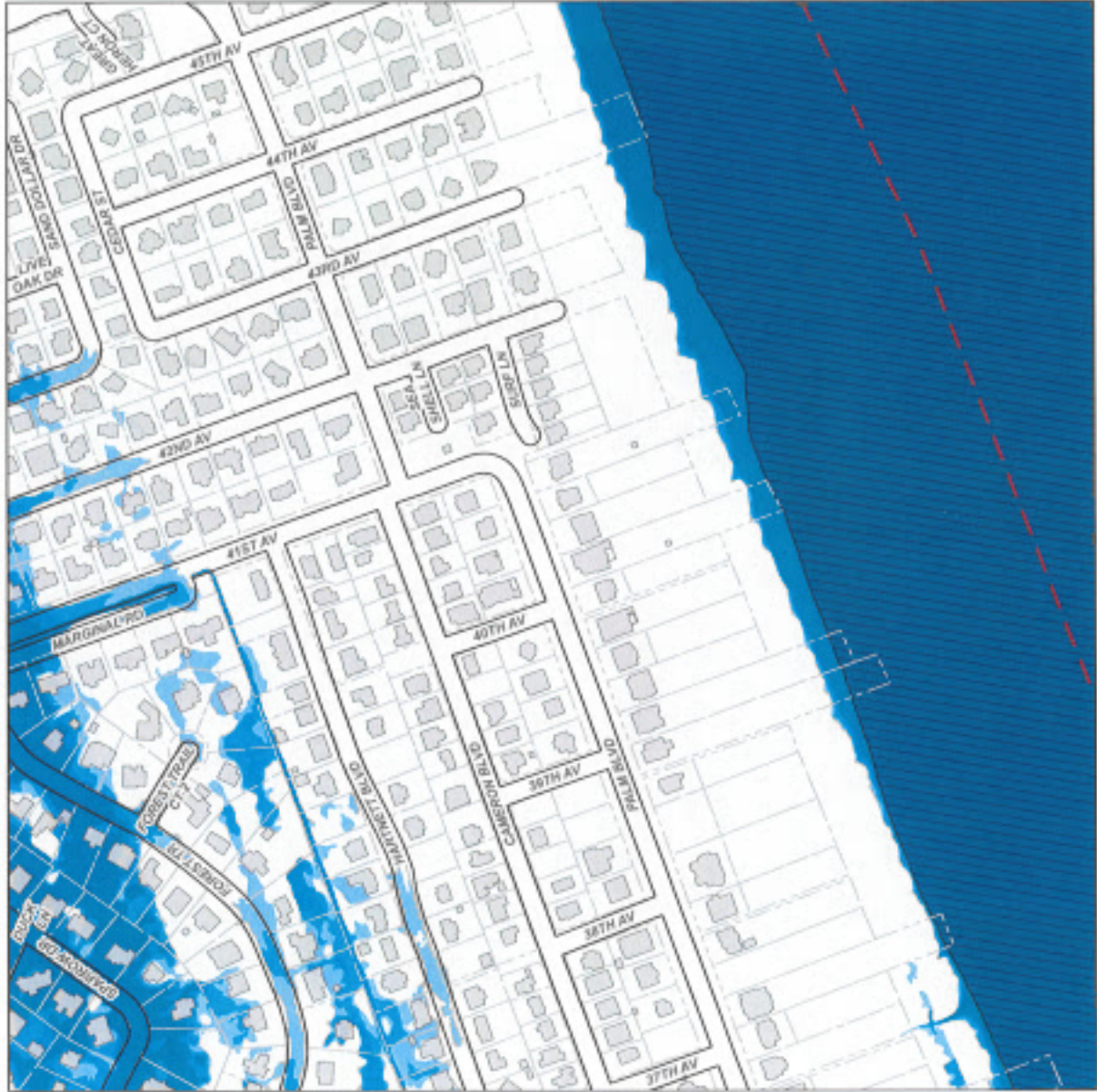


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if foundation boundary intersects parcel boundary.
5. Flood boundaries and results of the analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of variable-tide flooding.

**Legend**

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



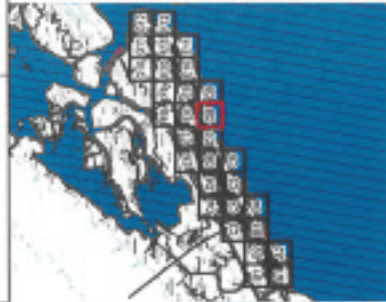
City of Isle of Palms, South Carolina  
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Appendix A

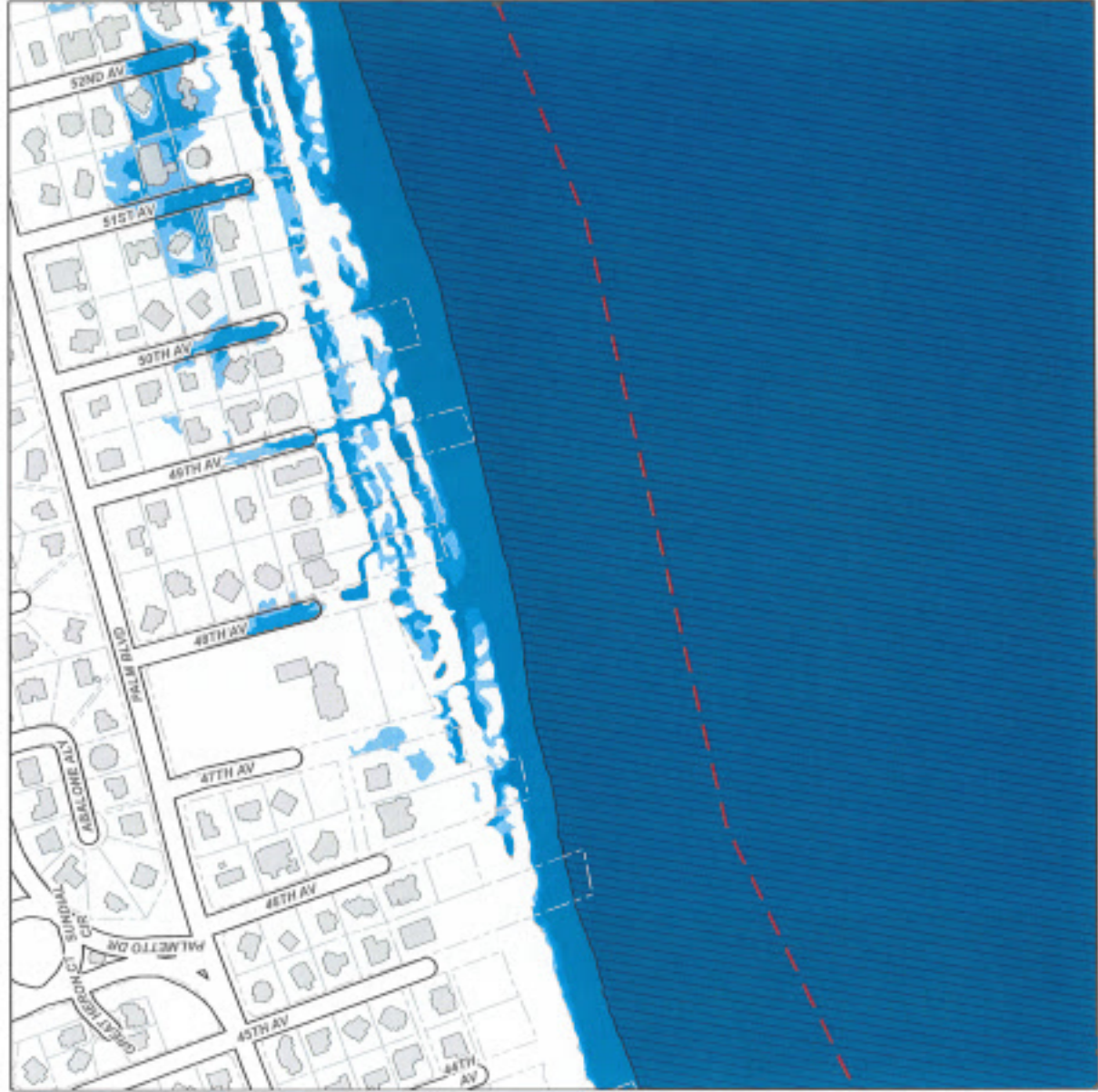
Sector D8

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NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. TSM boundaries were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary footprints are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of non-tidal stream flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



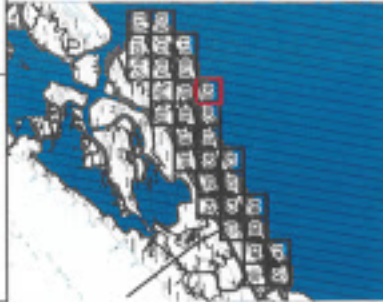
City of Isle of Palms, South Carolina  
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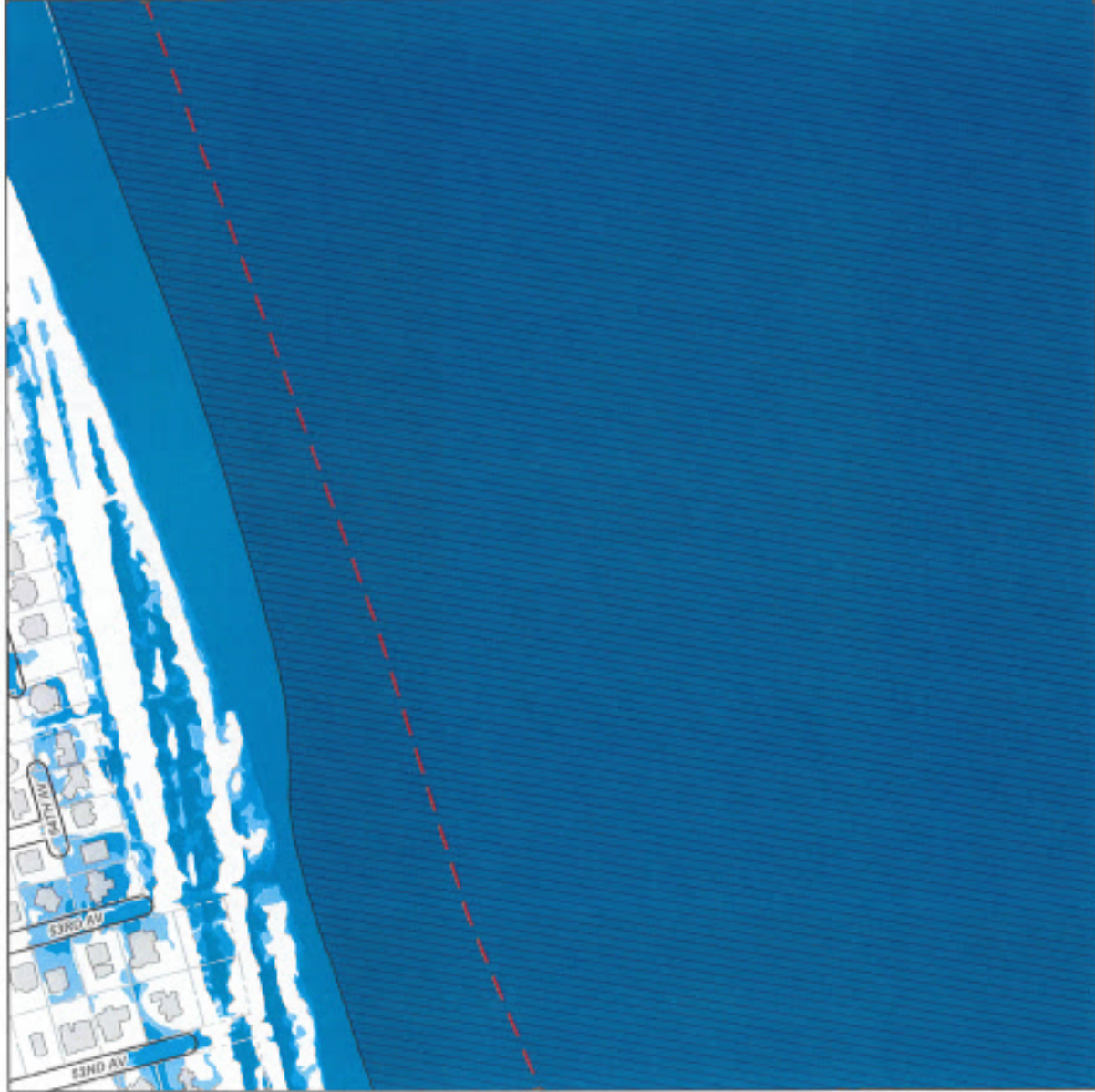


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inundations are possible due to local inundation.
6. These results do not account for the impact of rain-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



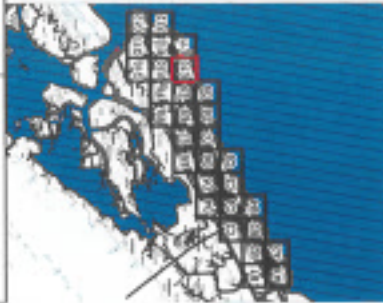
City of Isle of Palms, South Carolina  
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Appendix A

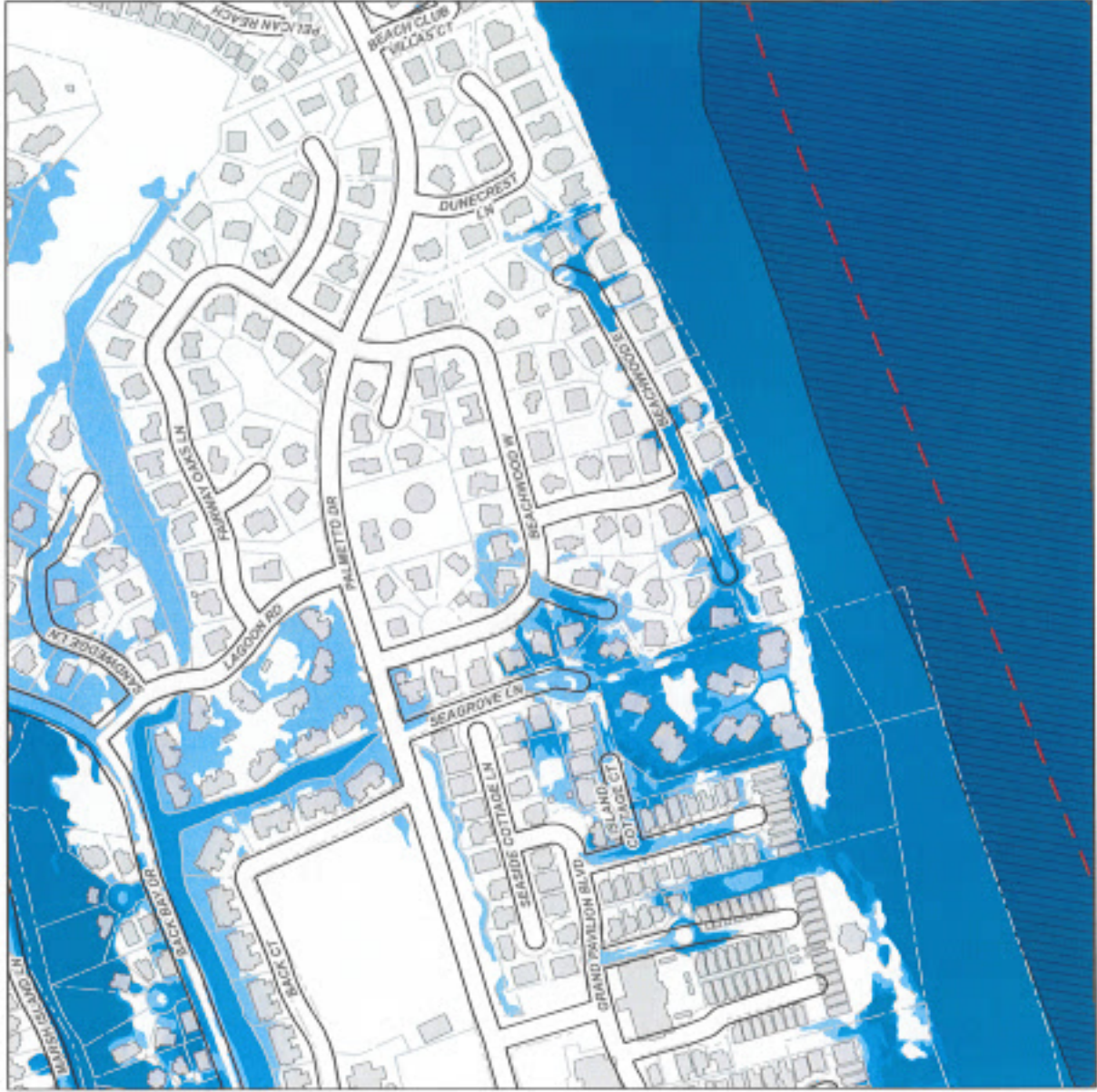
Sector E10

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NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of storm-driven flooding.



Legend

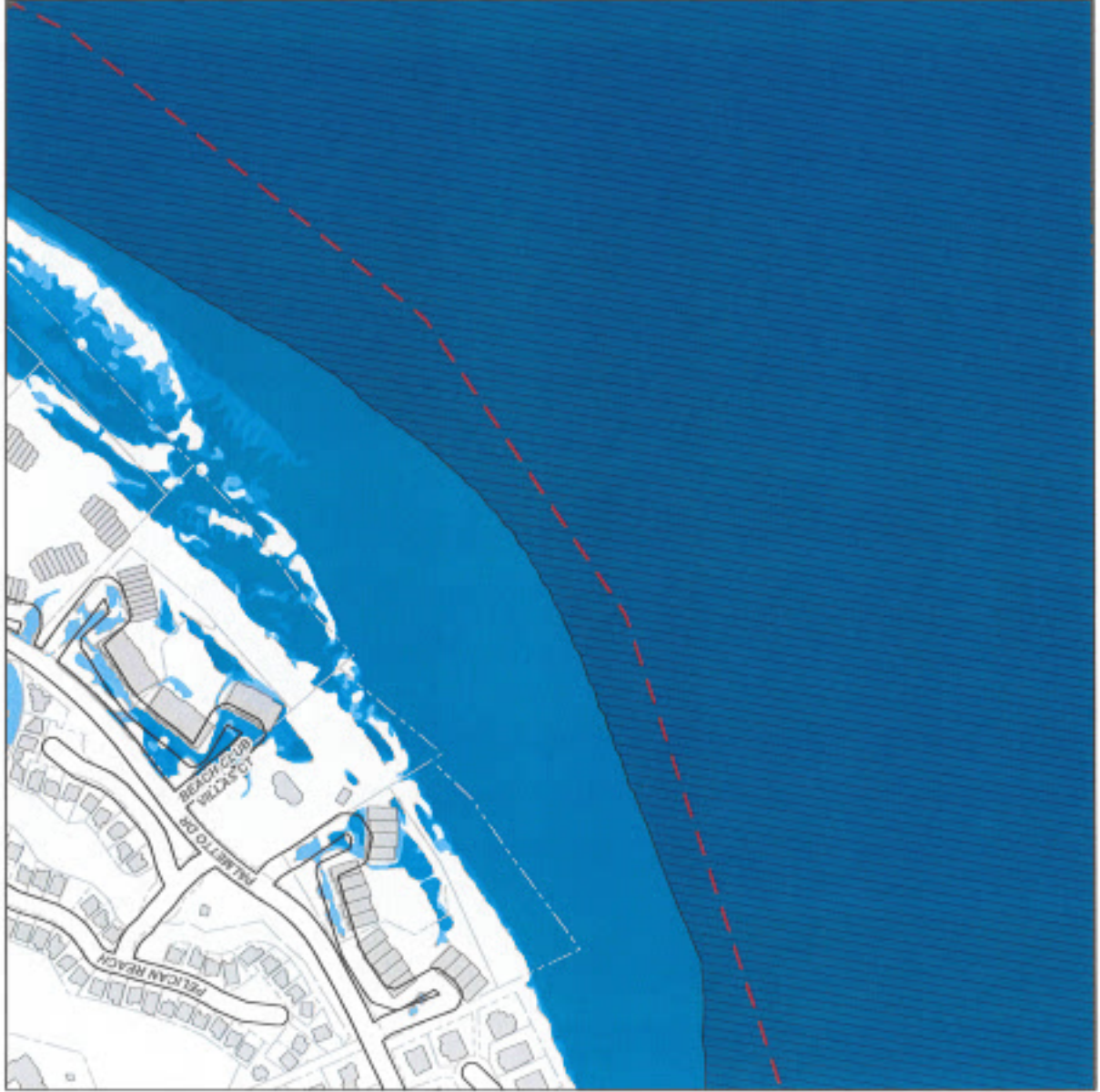
- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





NOTES:

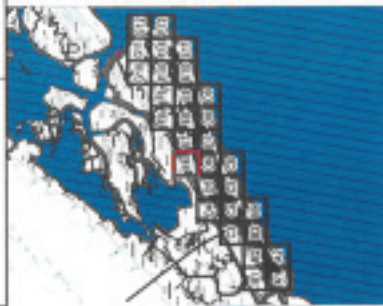
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only; inaccuracies are possible due to model limitations.
6. These results do not account for the impact of overland flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



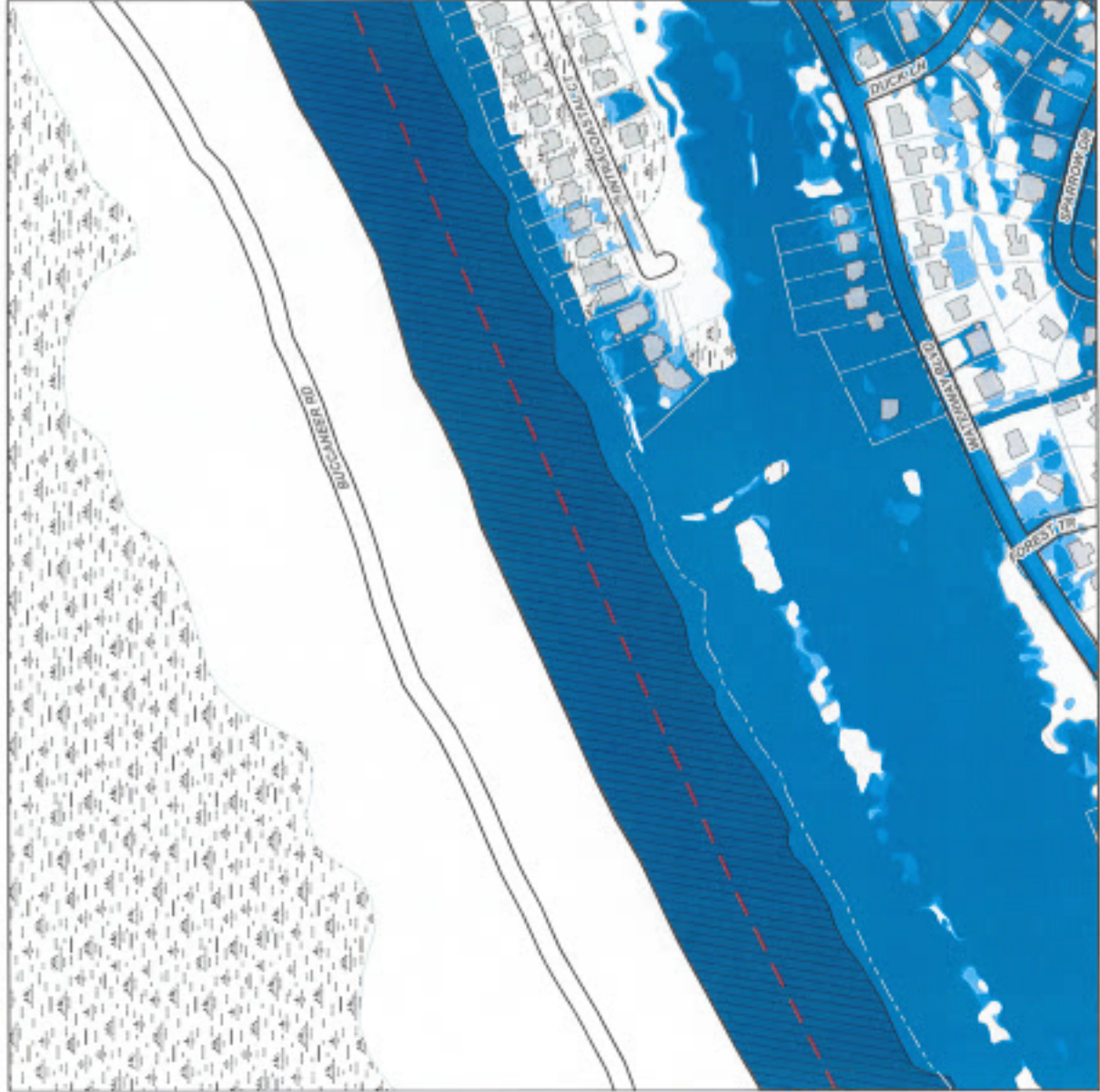


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of nearby dune loss.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





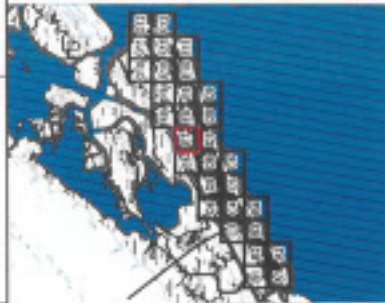
City of Isle of Palms, South Carolina  
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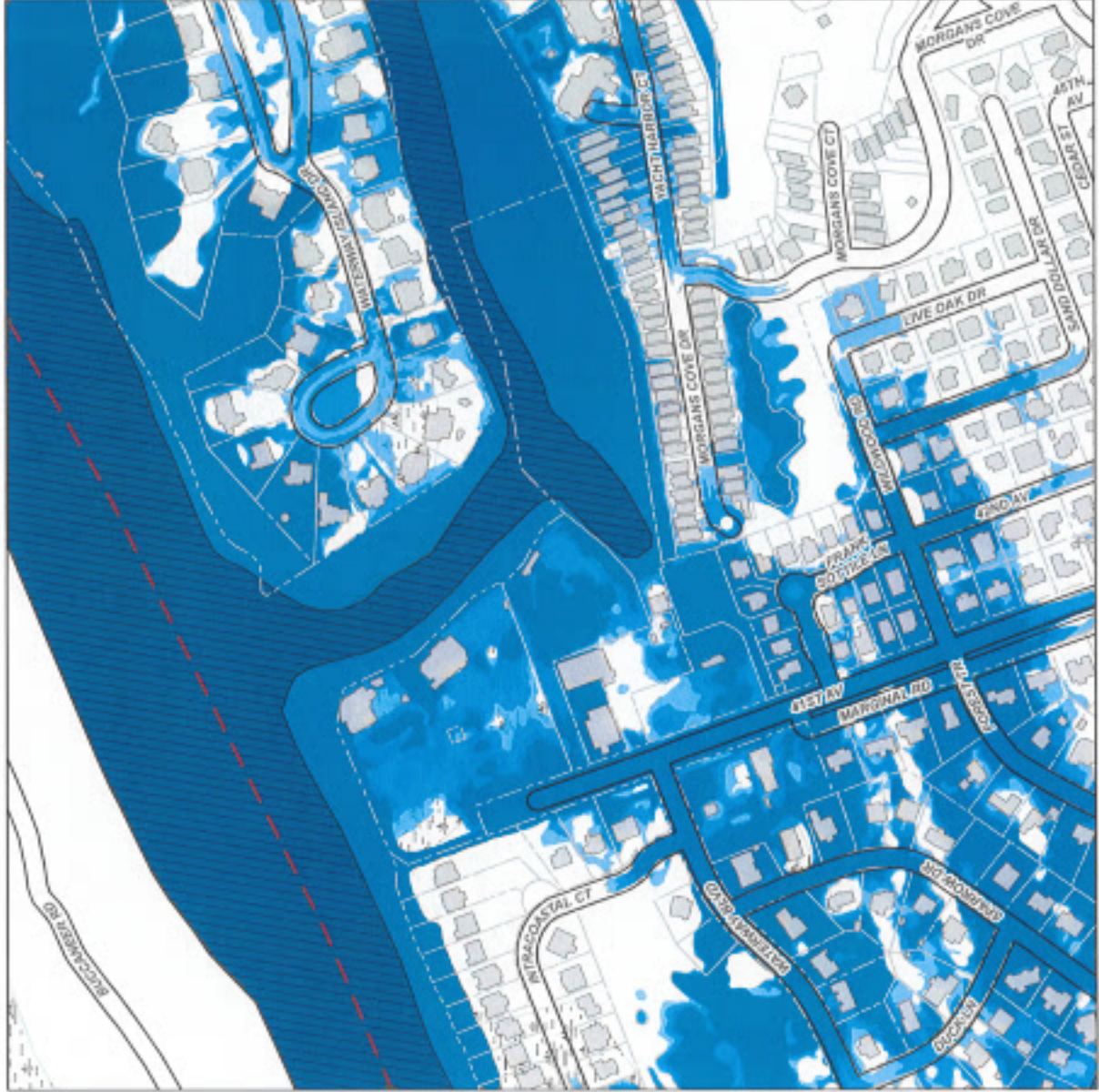


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total bountaine conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of rewilds driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary
  - 2023
  - 2030
  - 2040
  - 2050



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NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of nearby stream flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





NOTES:

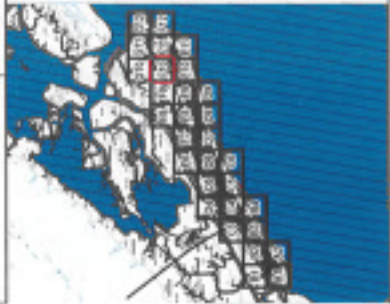
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood hazard areas and results of this analysis should be considered for planning purposes only. Hazard areas are possible due to model limitations.
6. These results do not account for the impact of nearby areas flooding.



Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- Maximum Inundation Boundary
- 2023
  - 2030
  - 2040
  - 2050





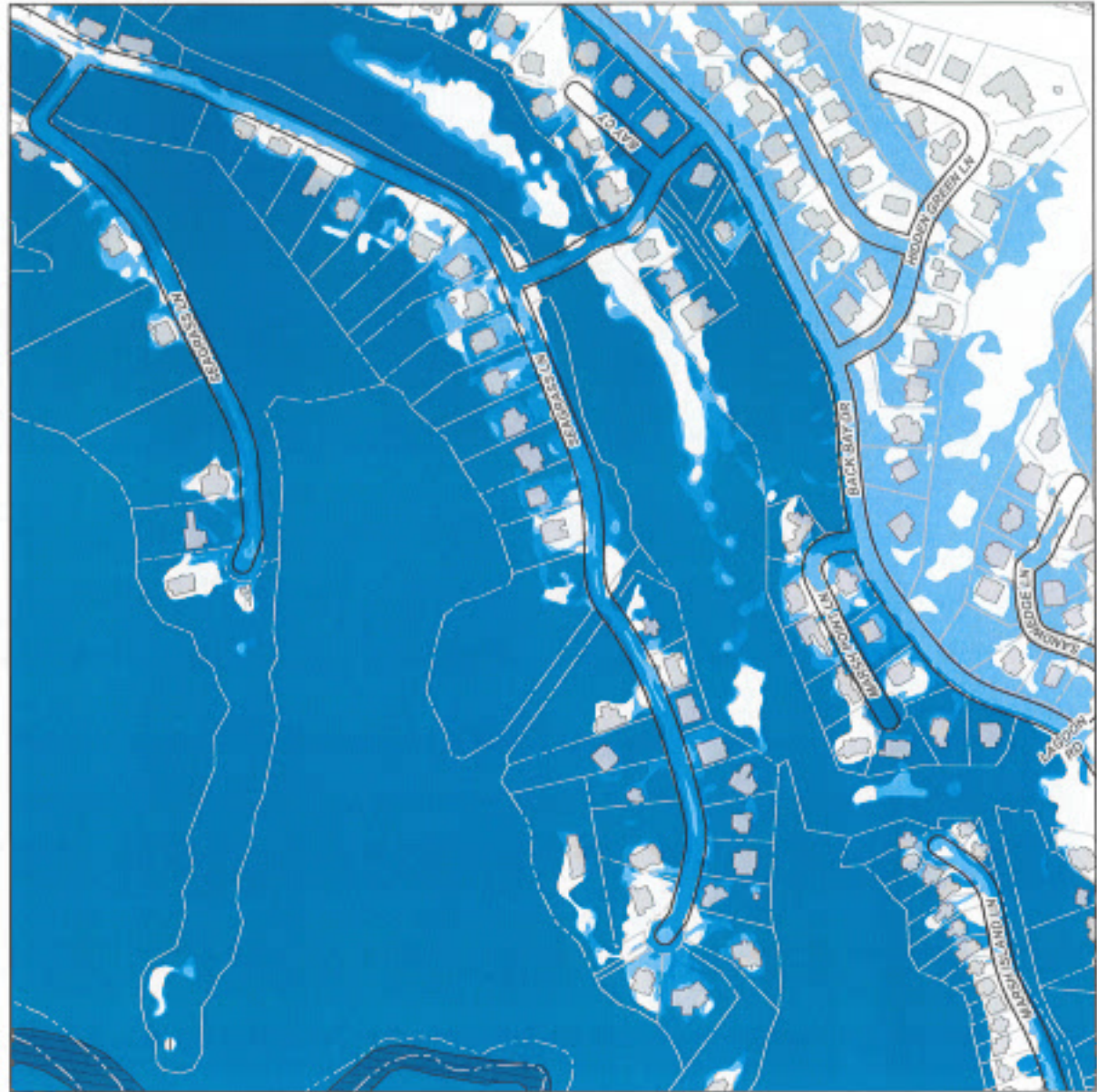
NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries created were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structures and parcel boundaries are approximate.
4. Parcels considered at risk of inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of wind-driven flooding.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Roadway
- Waterway
- Marsh

- Maximum Inundation Boundary
- 2023
  - 2030
  - 2040
  - 2050



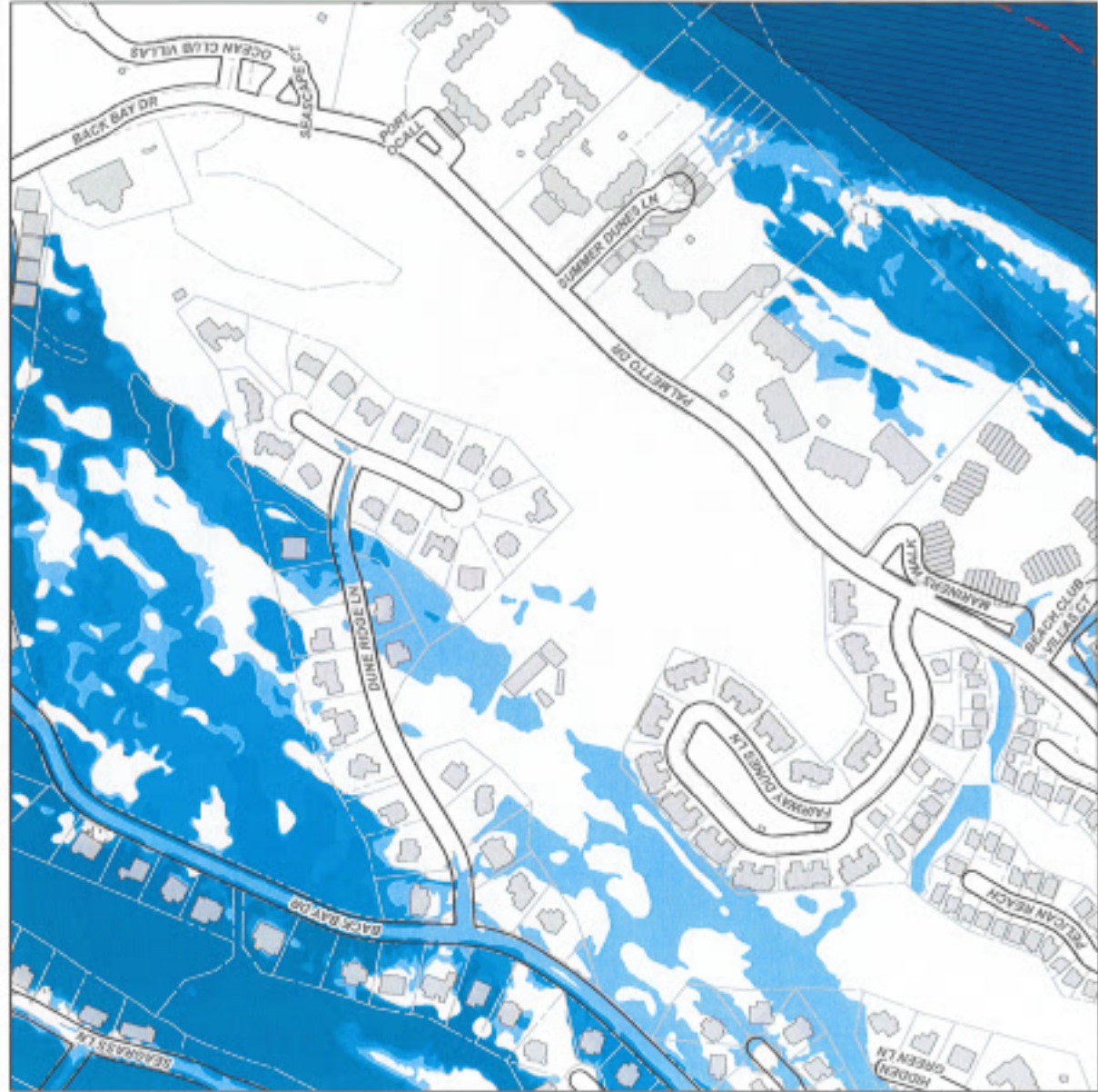


NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inundations are possible due to model limitations.
6. These results do not account for the impact of variable flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



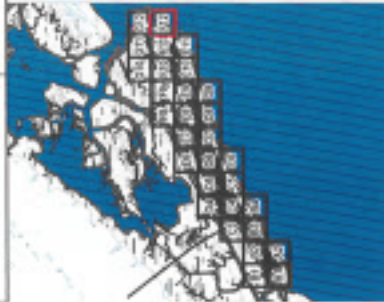
City of Isle of Palms, South Carolina  
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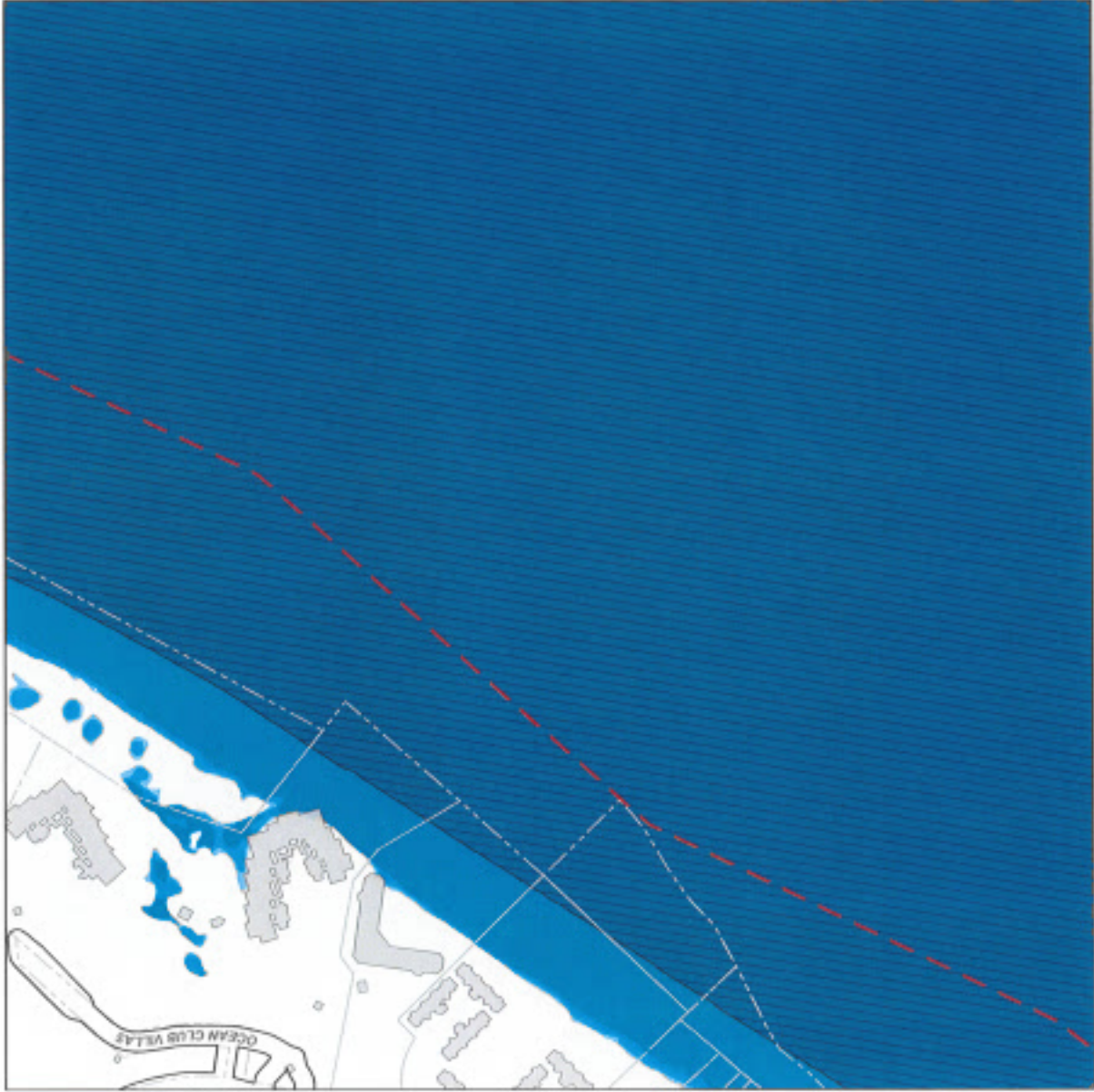


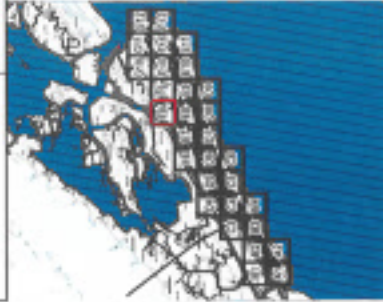
NOTES:

1. Flood inundation boundaries created using a 2D HEC-HMS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of wind-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of marsh stream flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary
  - 2023
  - 2030
  - 2040
  - 2060



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NOTES:

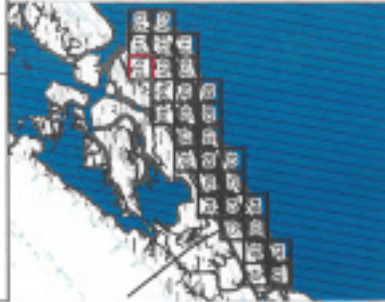
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structure and parcel boundary locations are approximate.
4. Parcels considered at-risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of weather-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050







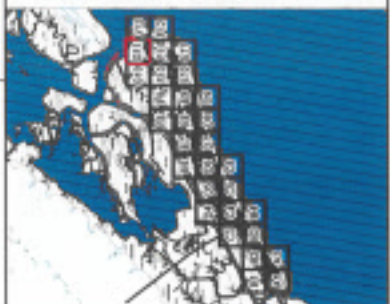
NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if foundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of rainfall-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050





- NOTES:**
1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
  2. Total boundaries conditions were developed for each target year based on projected sea level rise and vertical land subsidence (following methodology discussed in the Sea Level Rise Adaptation Plan).
  3. Existing structure and parcel boundary locations are approximate.
  4. Parcels considered at risk of inundation boundary intersects parcel boundary.
  5. Flood inundation and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
  6. These results do not account for the impact of rainfall-driven flooding.

**Legend**

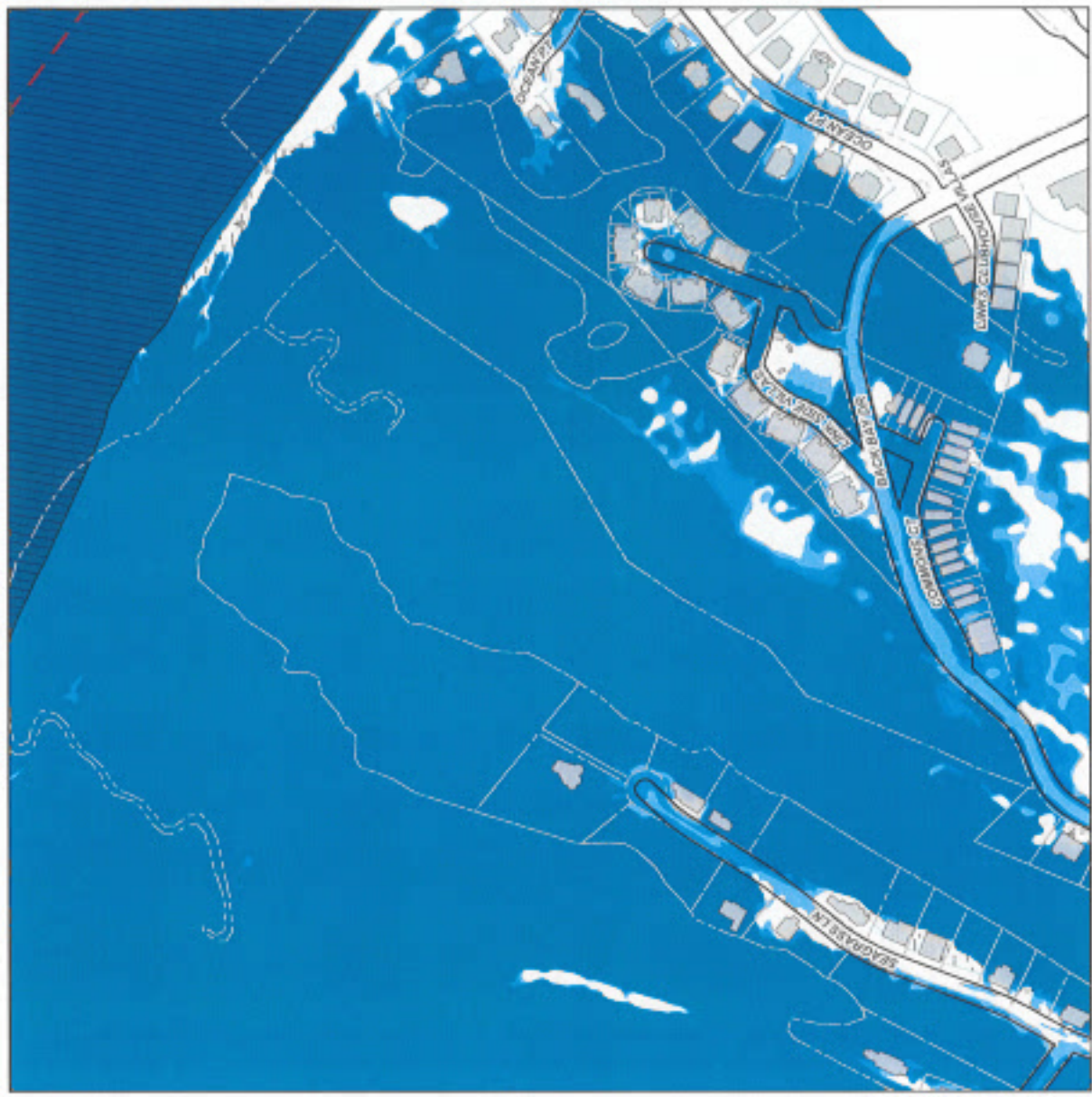
- Study Boundary
- Existing Structure
- Parcel Boundary
- Roadway
- Waterway
- Marsh

**Maximum Inundation Boundary**

- 2023
- 2030
- 2040
- 2050

N  
W E S

0 250 500 1,000 Feet



City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis

Appendix A

Sector G12

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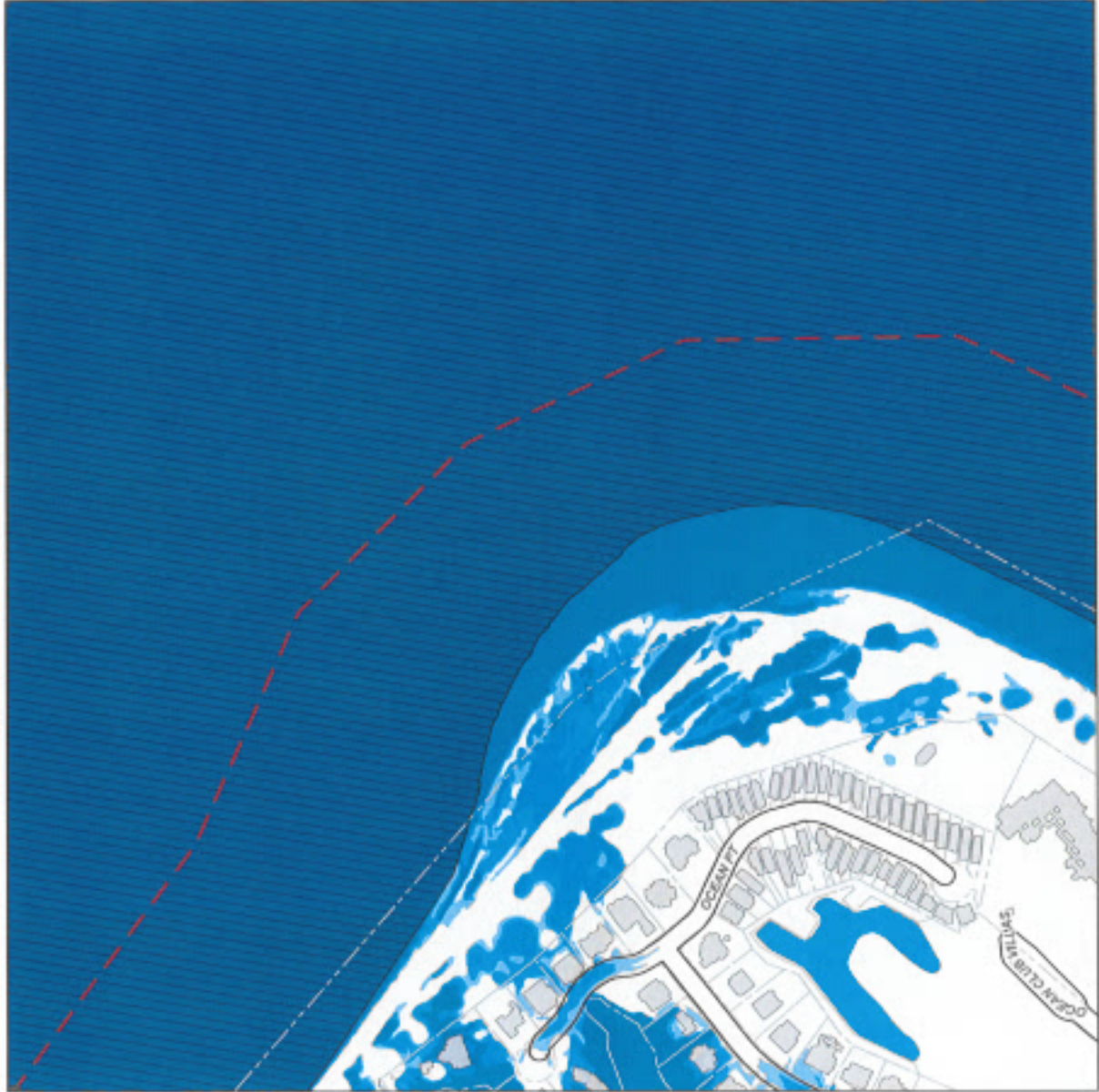


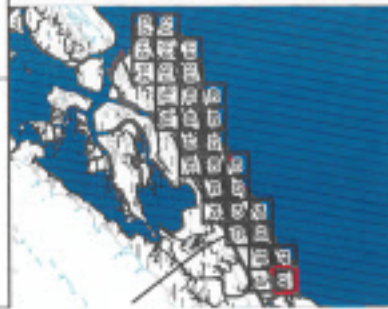
NOTES:

1. Flood inundation boundaries created using a 2D HEC-RAS model of the study area.
2. Total boundaries shown were developed for each target year based on projected sea level rise and vertical land subsidence following methodology discussed in the Sea Level Rise Adaptation Plan.
3. Existing structures and parcel boundary locations are approximate.
4. Parcels considered at risk if inundation boundary intersects parcel boundary.
5. Flood boundaries and results of this analysis should be considered for planning purposes only. Inaccuracies are possible due to model limitations.
6. These results do not account for the impact of wind-driven flooding.

Legend

- Study Boundary
  - Existing Structure
  - Parcel Boundary
  - Roadway
  - Waterway
  - Marsh
- 
- Maximum Inundation Boundary**
  - 2023
  - 2030
  - 2040
  - 2050



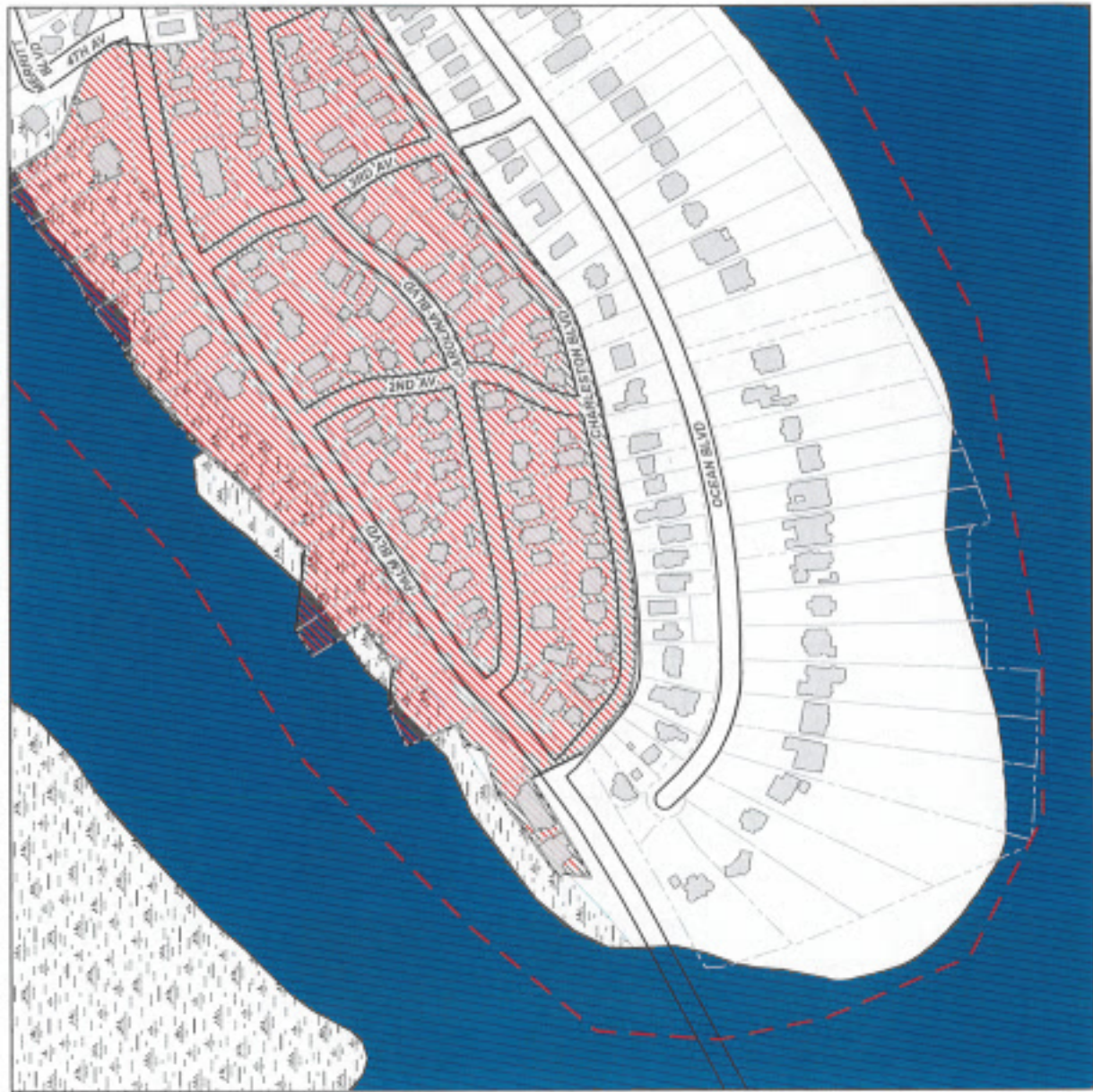


NOTES

1. Existing structure and parcel boundary footprints are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



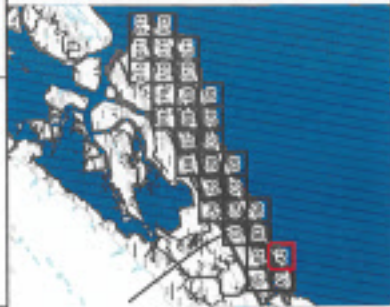
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis  
Sewer Master Plan Supplementary Data

Appendix B

Sector A2

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NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



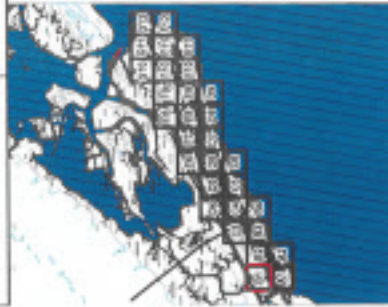
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis  
Sewer Master Plan Supplementary Data

Appendix B

Sector B1

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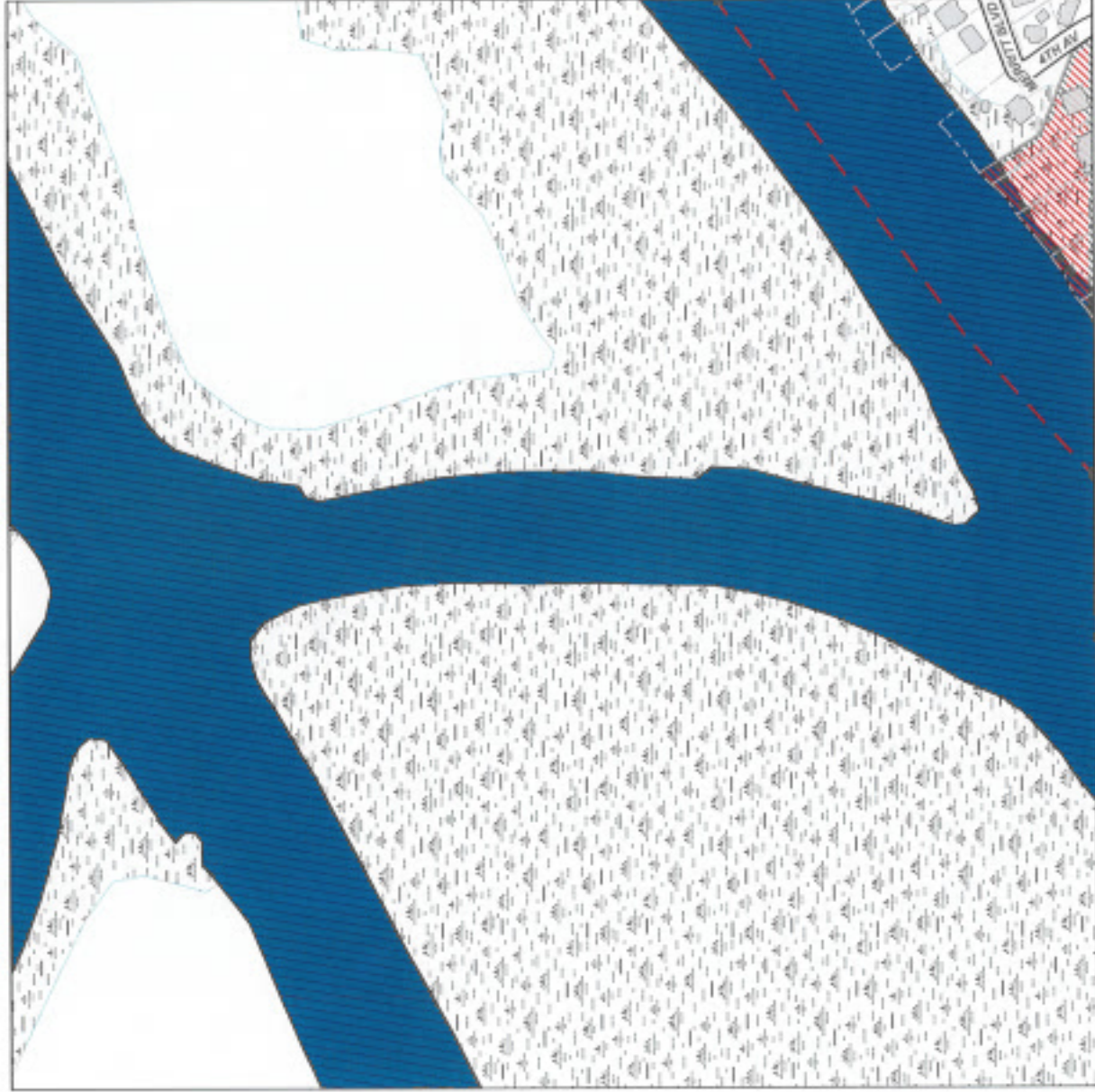


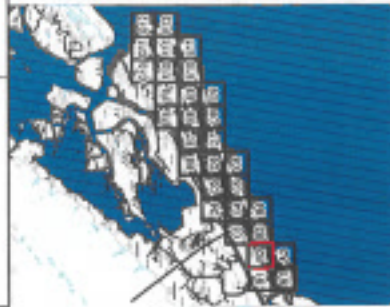
NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



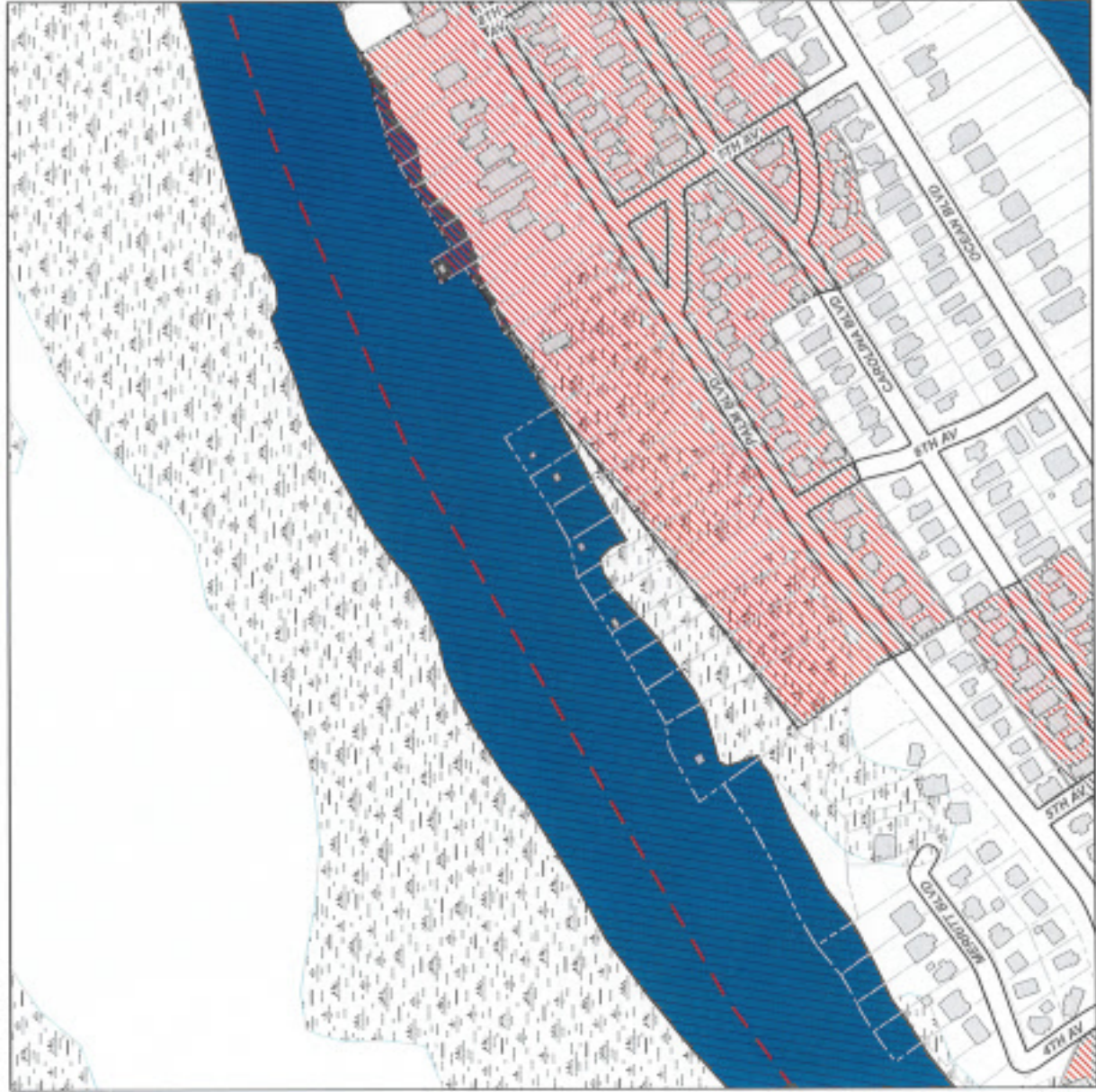


NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Sewer service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



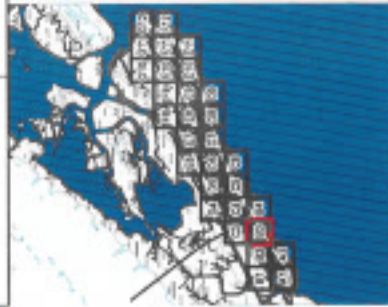
City of Isle of Palms, South Carolina  
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Appendix B

Sector B3

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NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2015 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





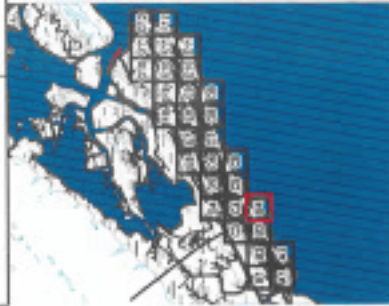
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

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Appendix B

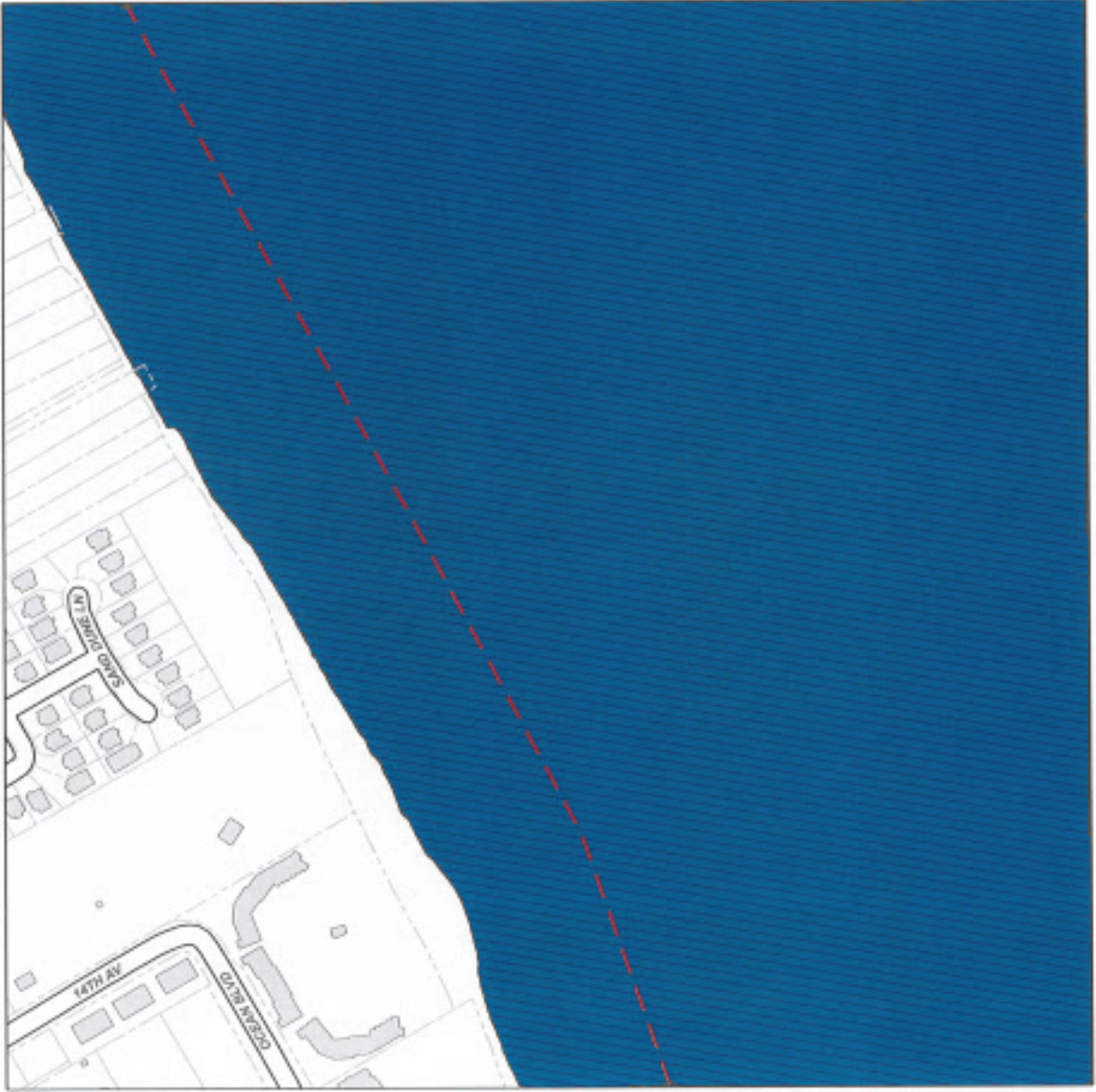
Sector B4

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NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2019 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



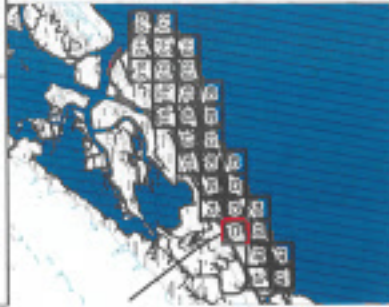
City of Isle of Palms, South Carolina  
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Appendix B

Sector C3

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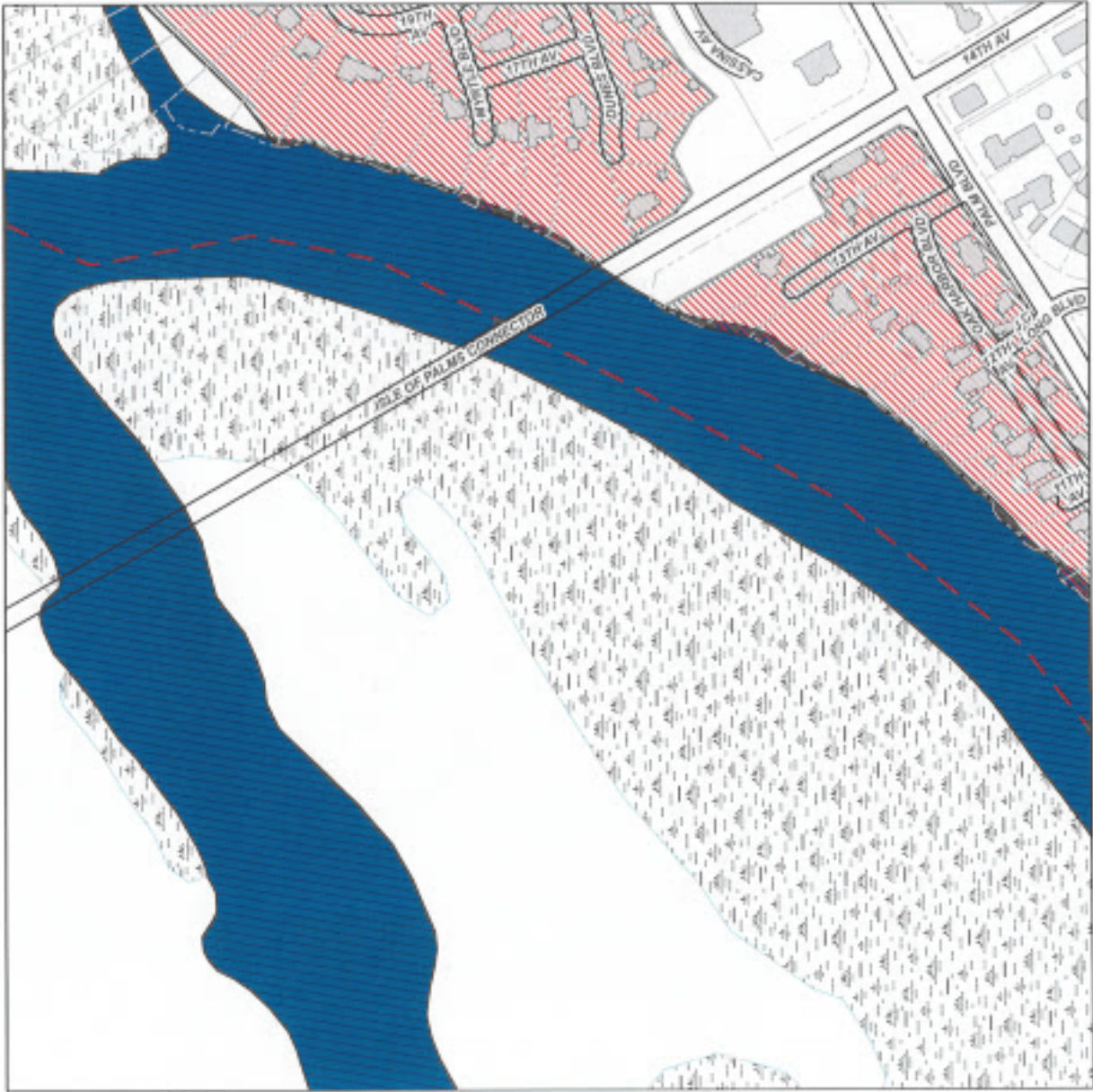


NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



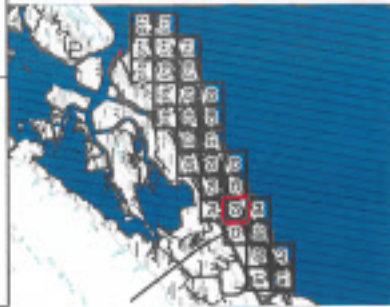
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

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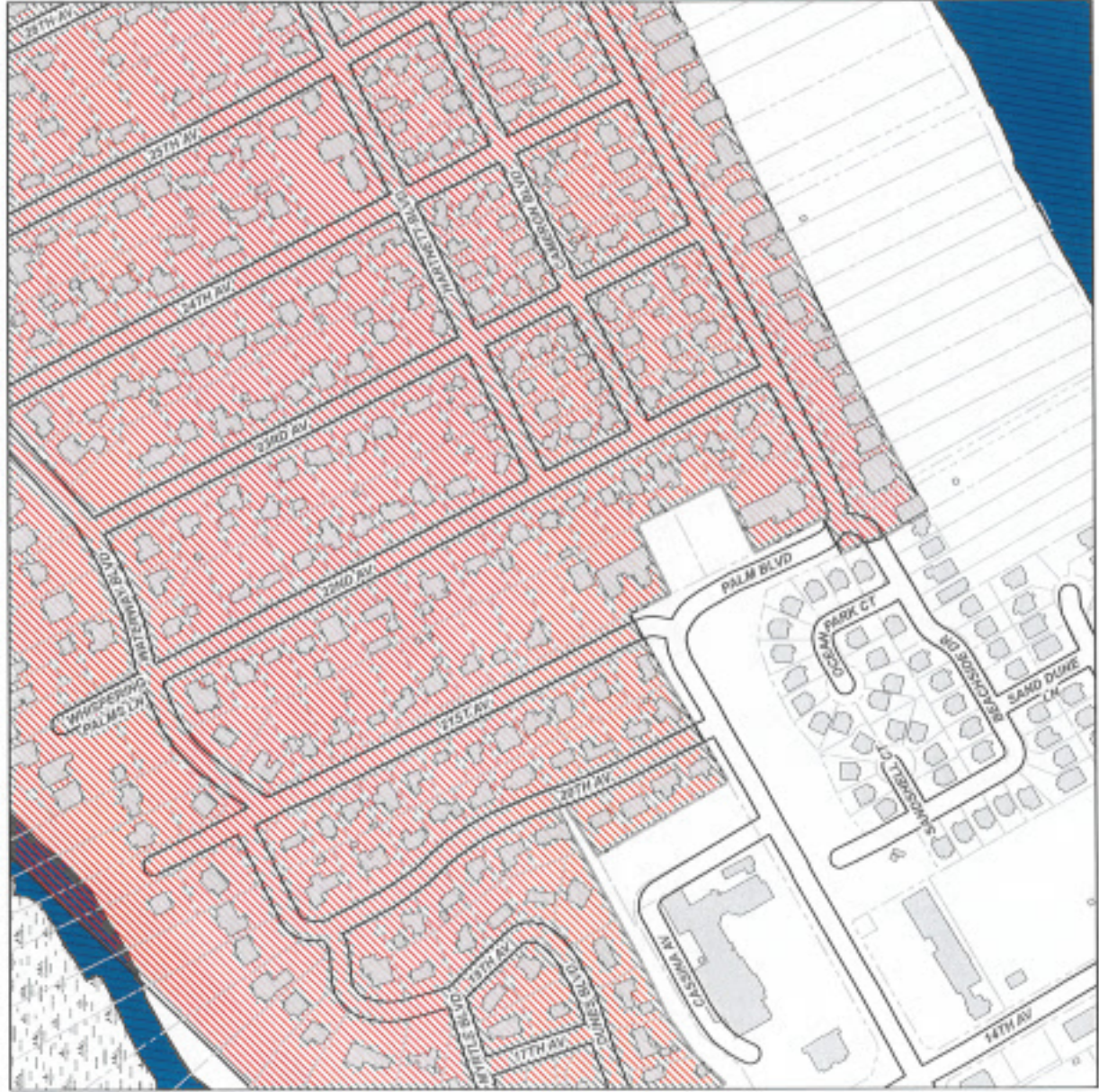
Sector C4

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NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



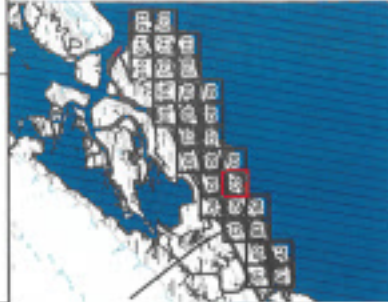
City of Isle of Palms, South Carolina  
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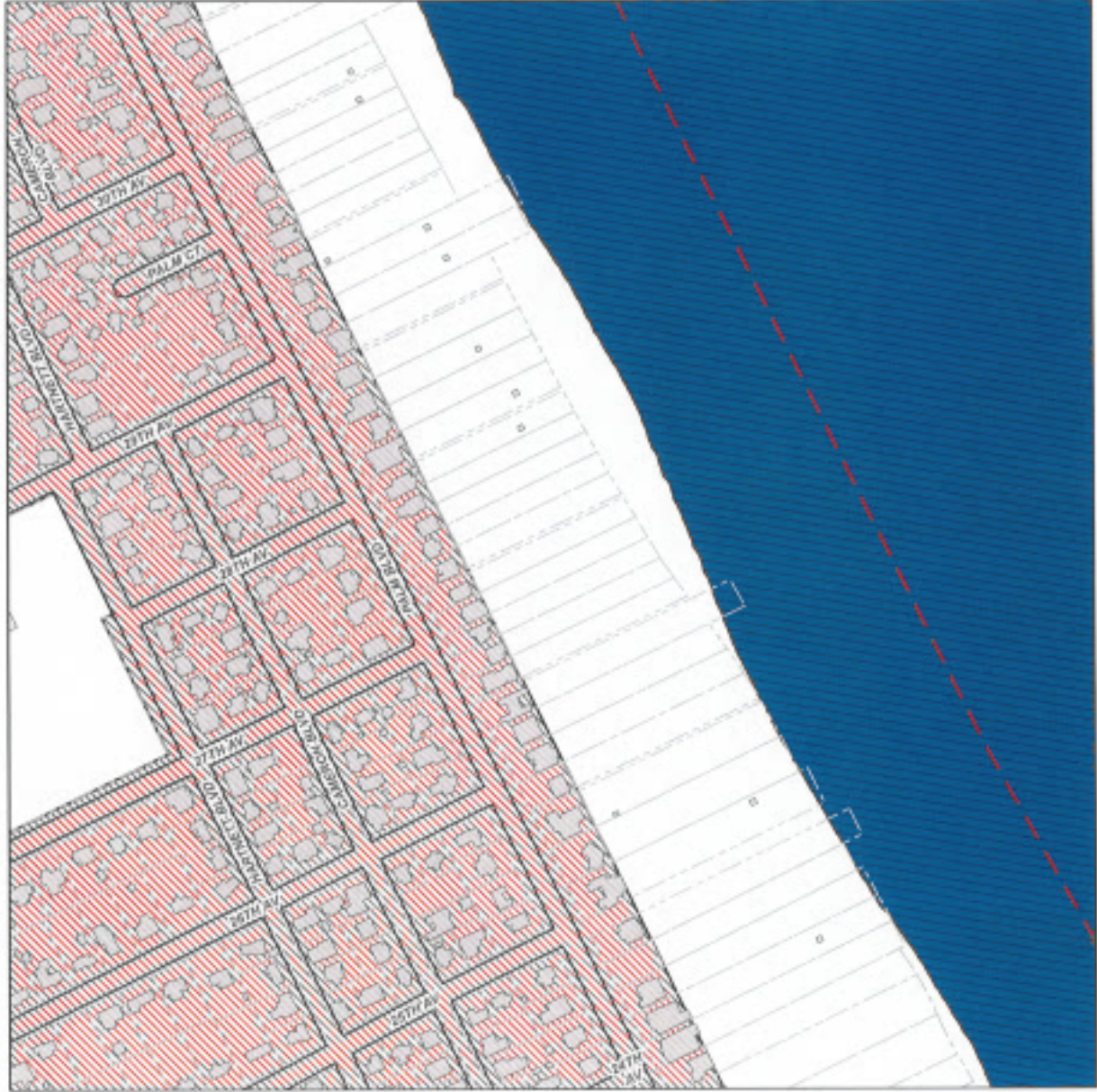
Sector C5

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NOTES:

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



City of Isle of Palms, South Carolina  
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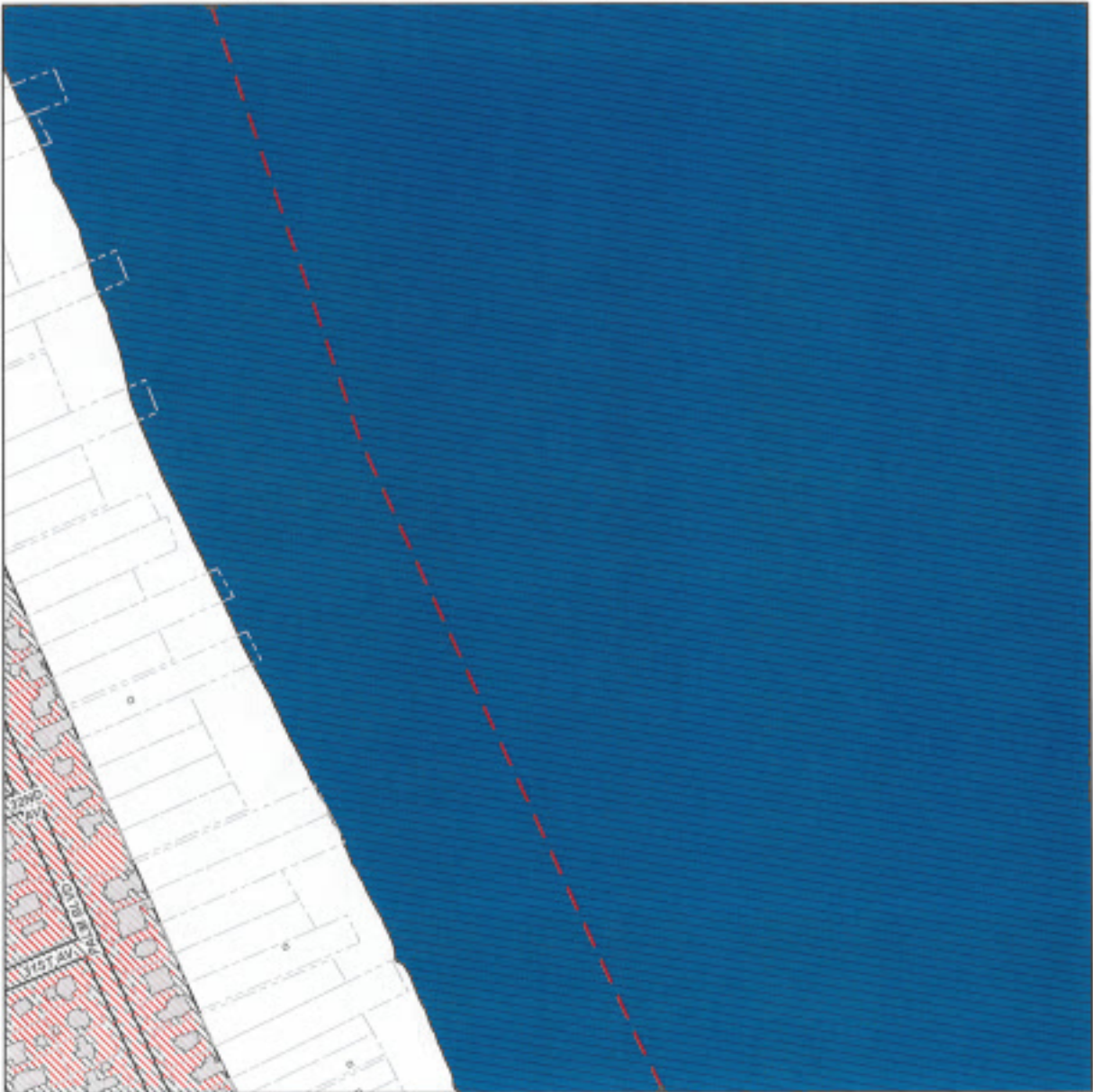
Sector C6

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NOTES:

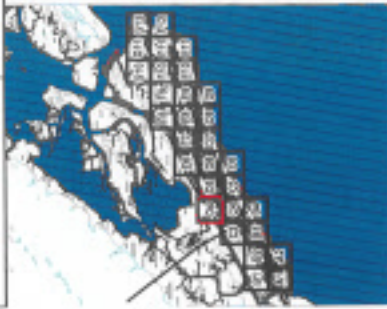
1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



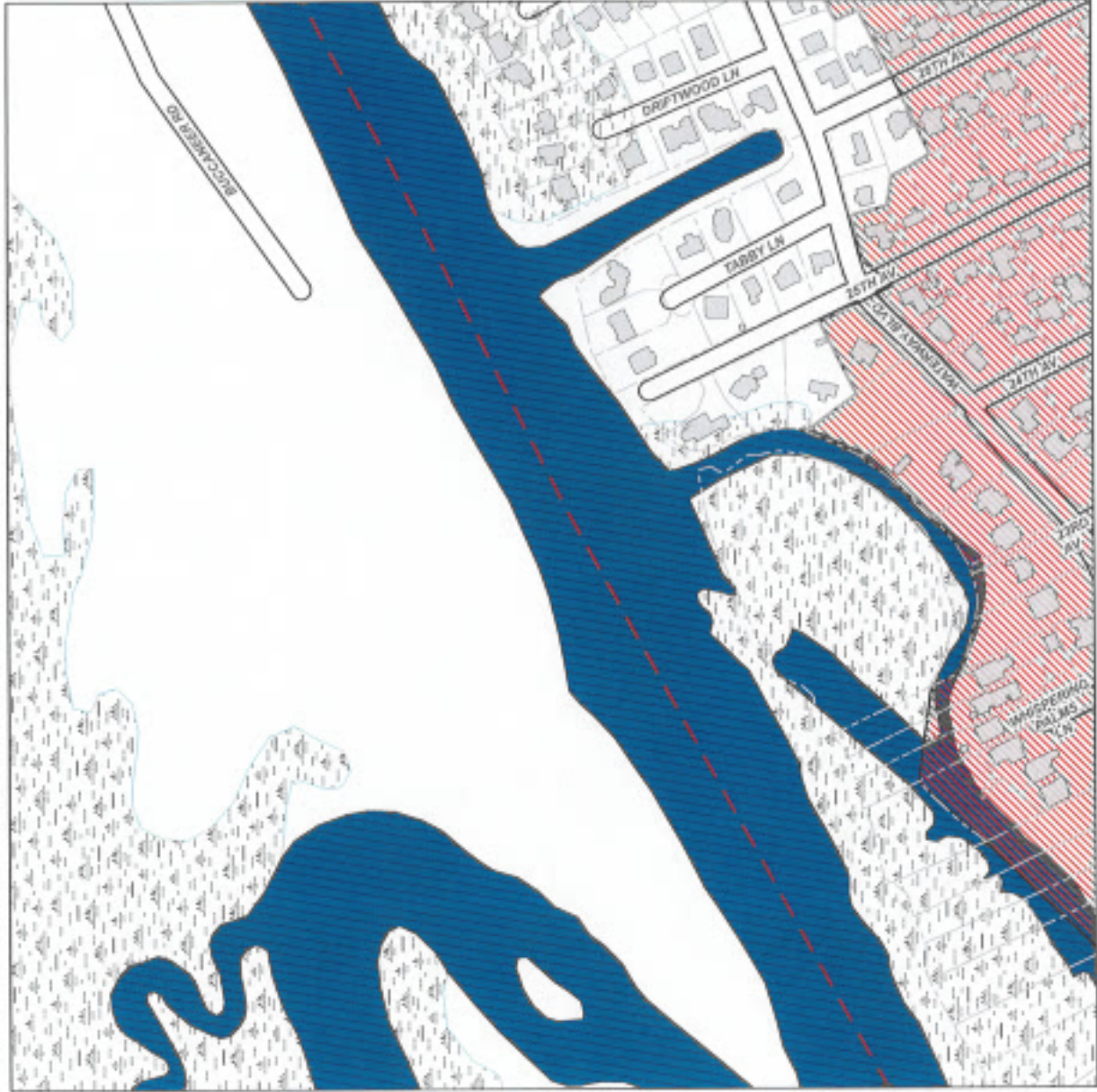


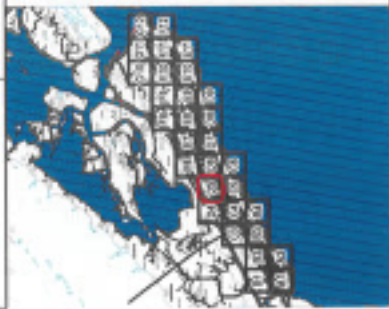
NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

**Legend**

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



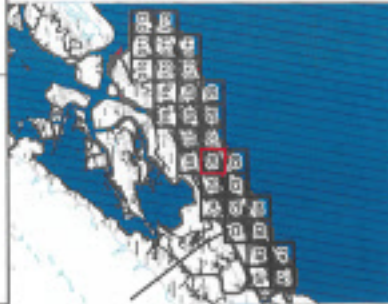
City of Isle of Palms, South Carolina  
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Appendix B

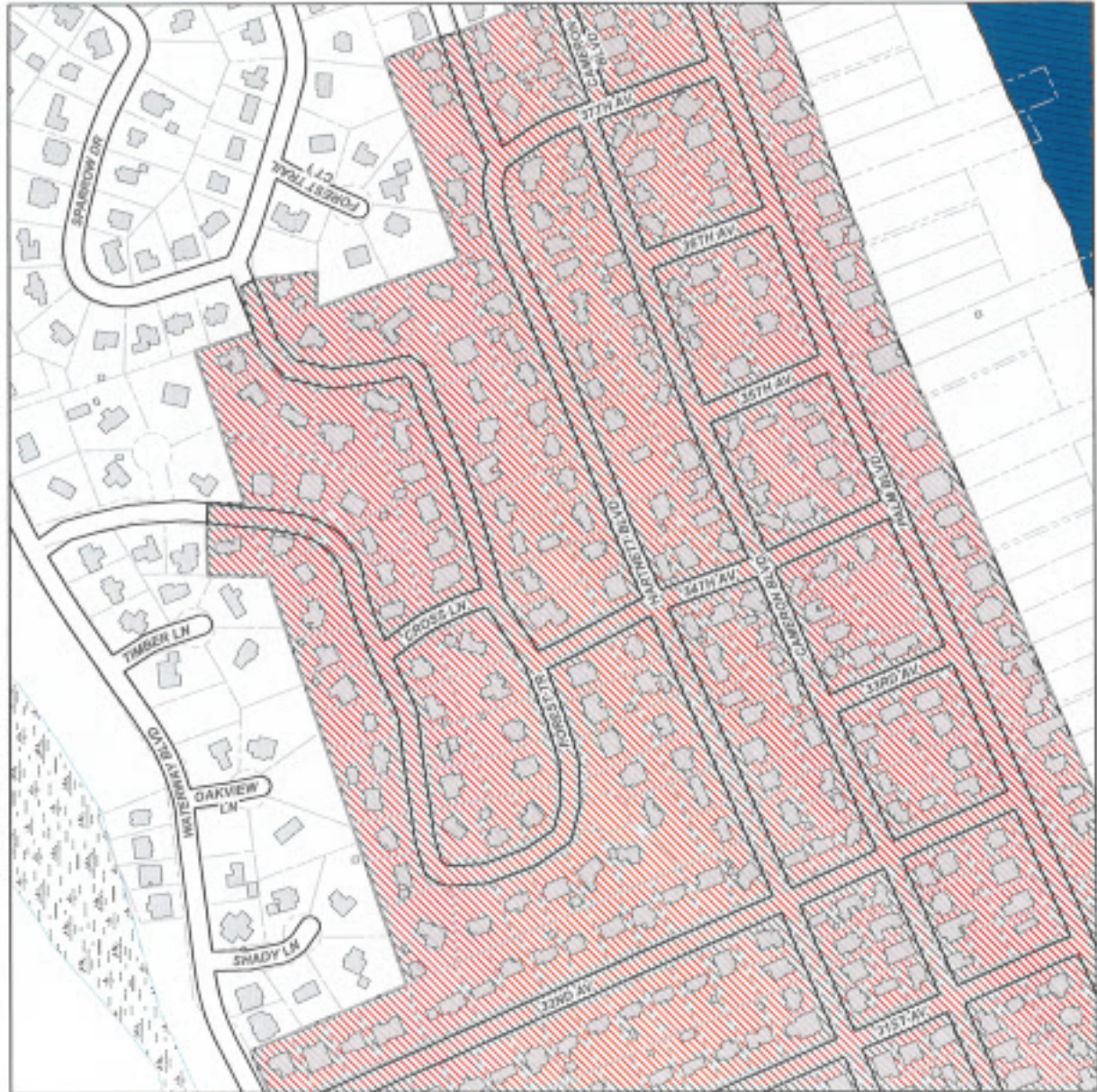
Sector D6

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NOTE:

- Existing structures and parcel boundary locations are approximate.
- Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





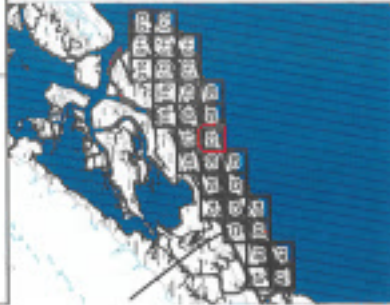
City of Isle of Palms, South Carolina  
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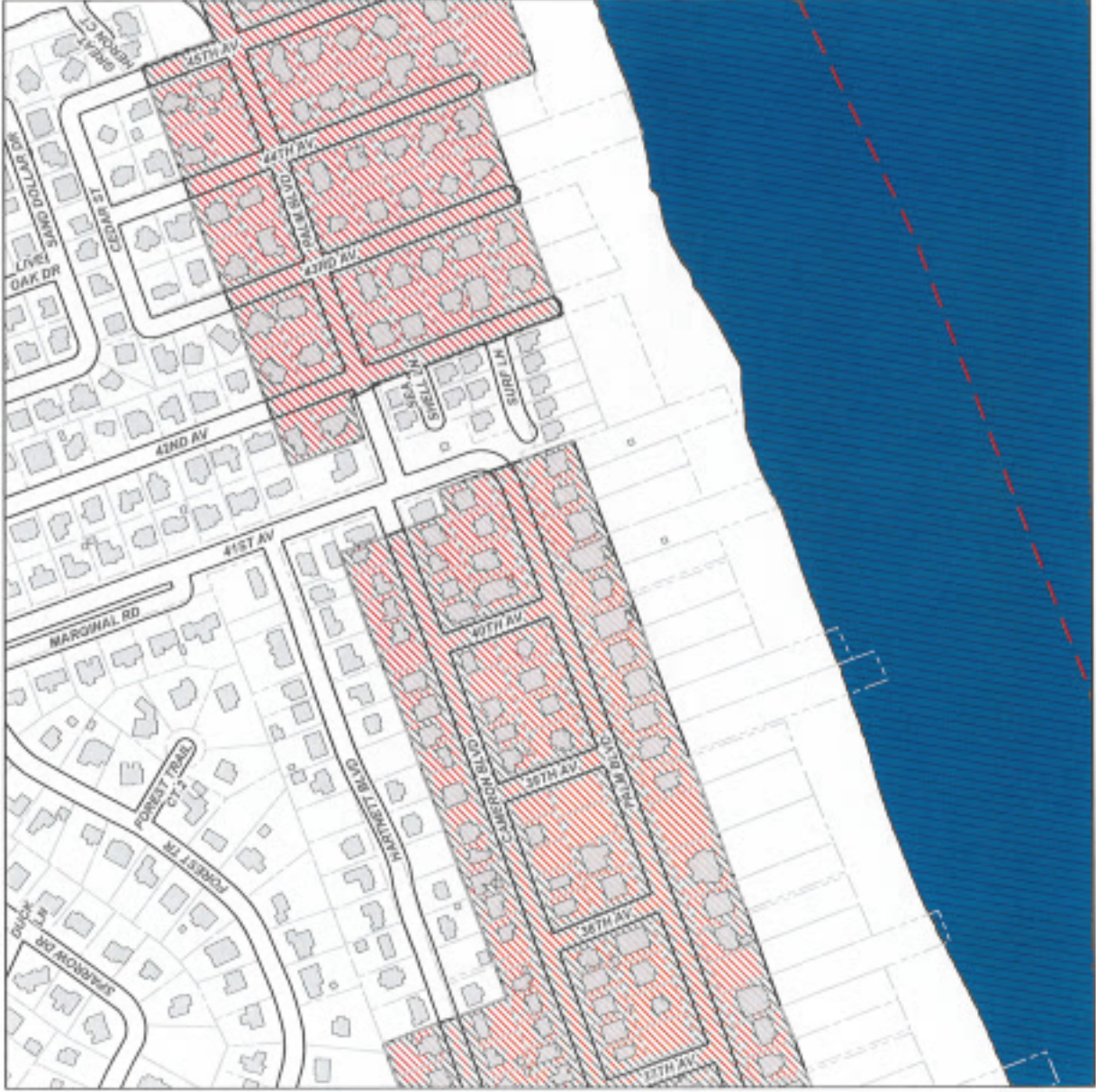
Sector D7

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NOTES:

1. Building structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2015 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



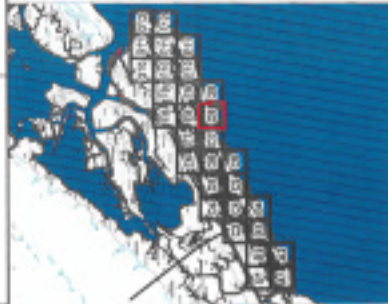
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

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Sewer Master Plan Supplementary Data

Appendix B

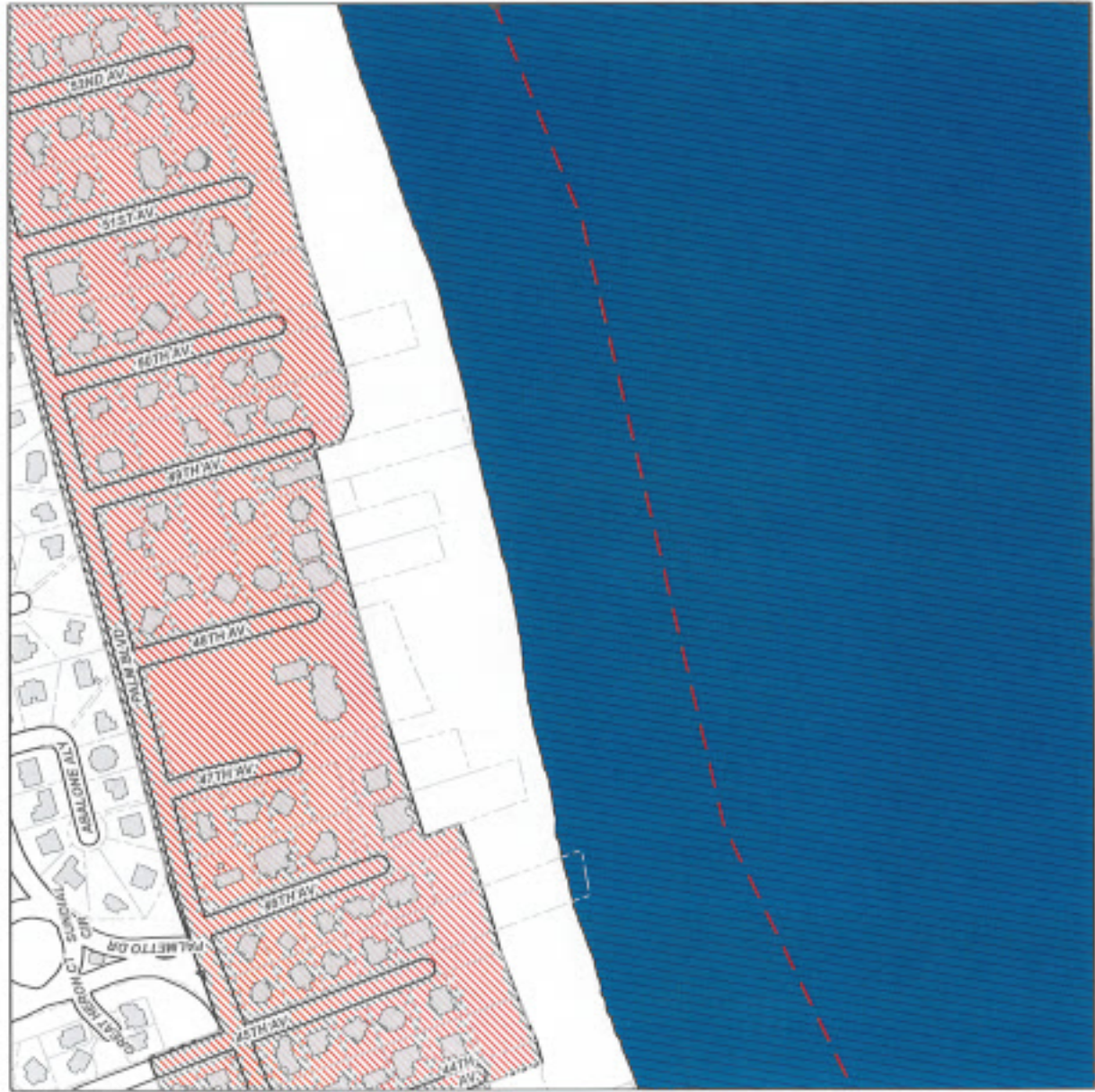
Sector D8

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NOTES:

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



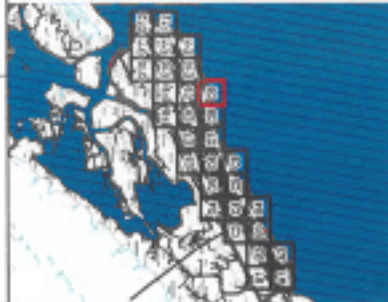
City of Isle of Palms, South Carolina  
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Sewer Master Plan Supplementary Data

Appendix B

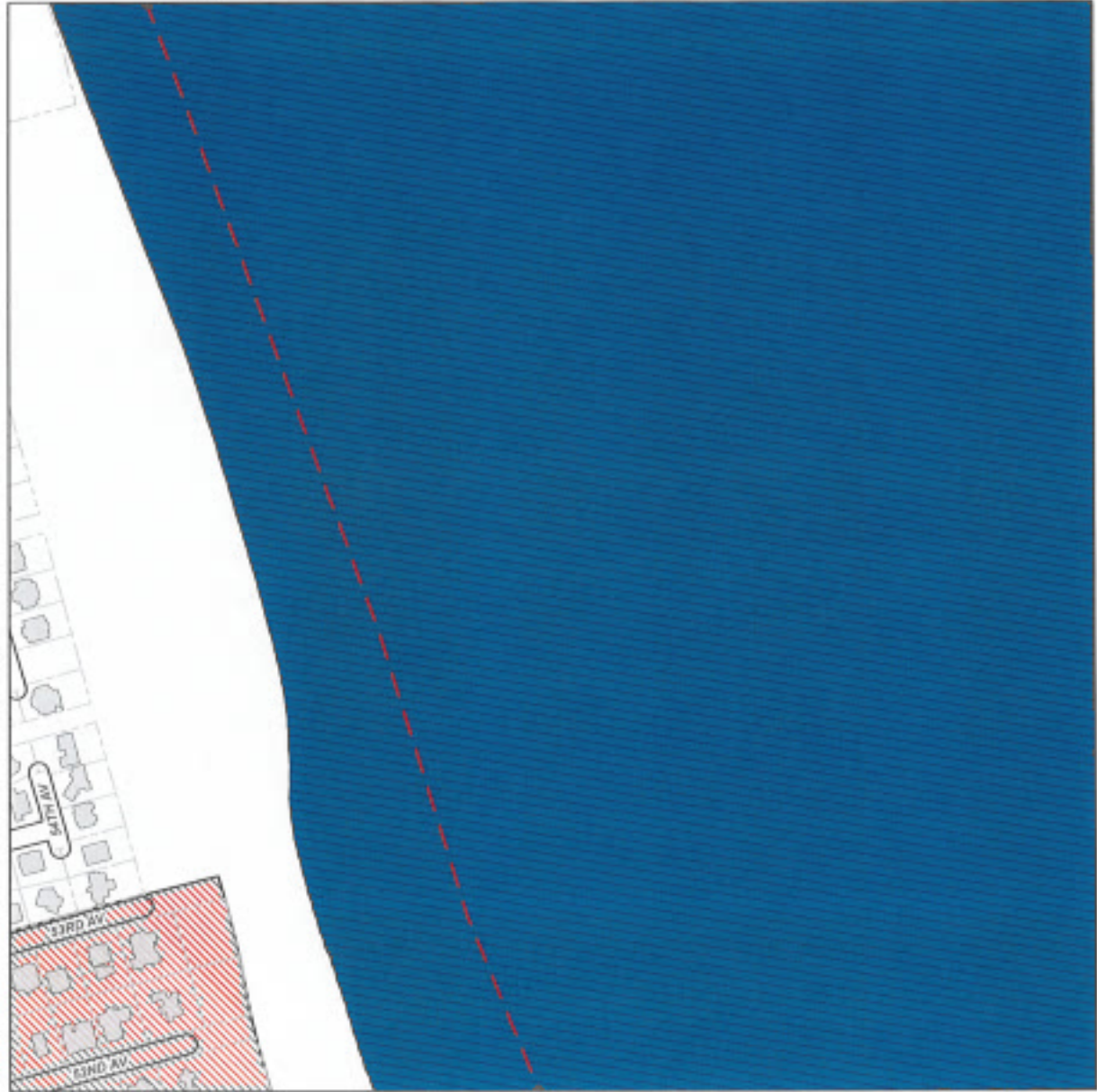
Sector D9

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NOTES

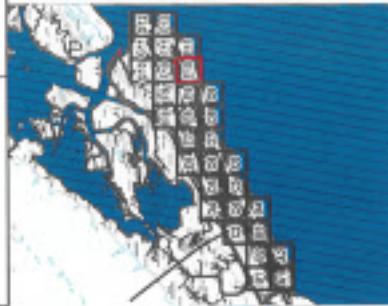
1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





NOTES:

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



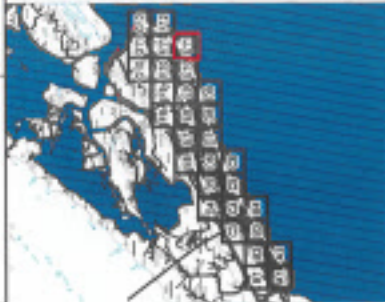
City of Isle of Palms, South Carolina  
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Sewer Master Plan Supplementary Data

Appendix B

Sector E11



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NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2019 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



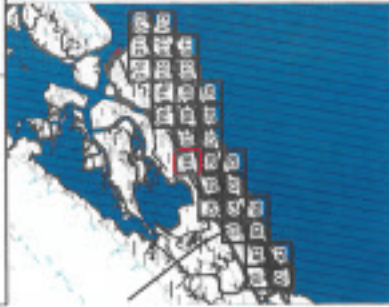
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis  
Sewer Master Plan Supplementary Data

Appendix B

Sector E6

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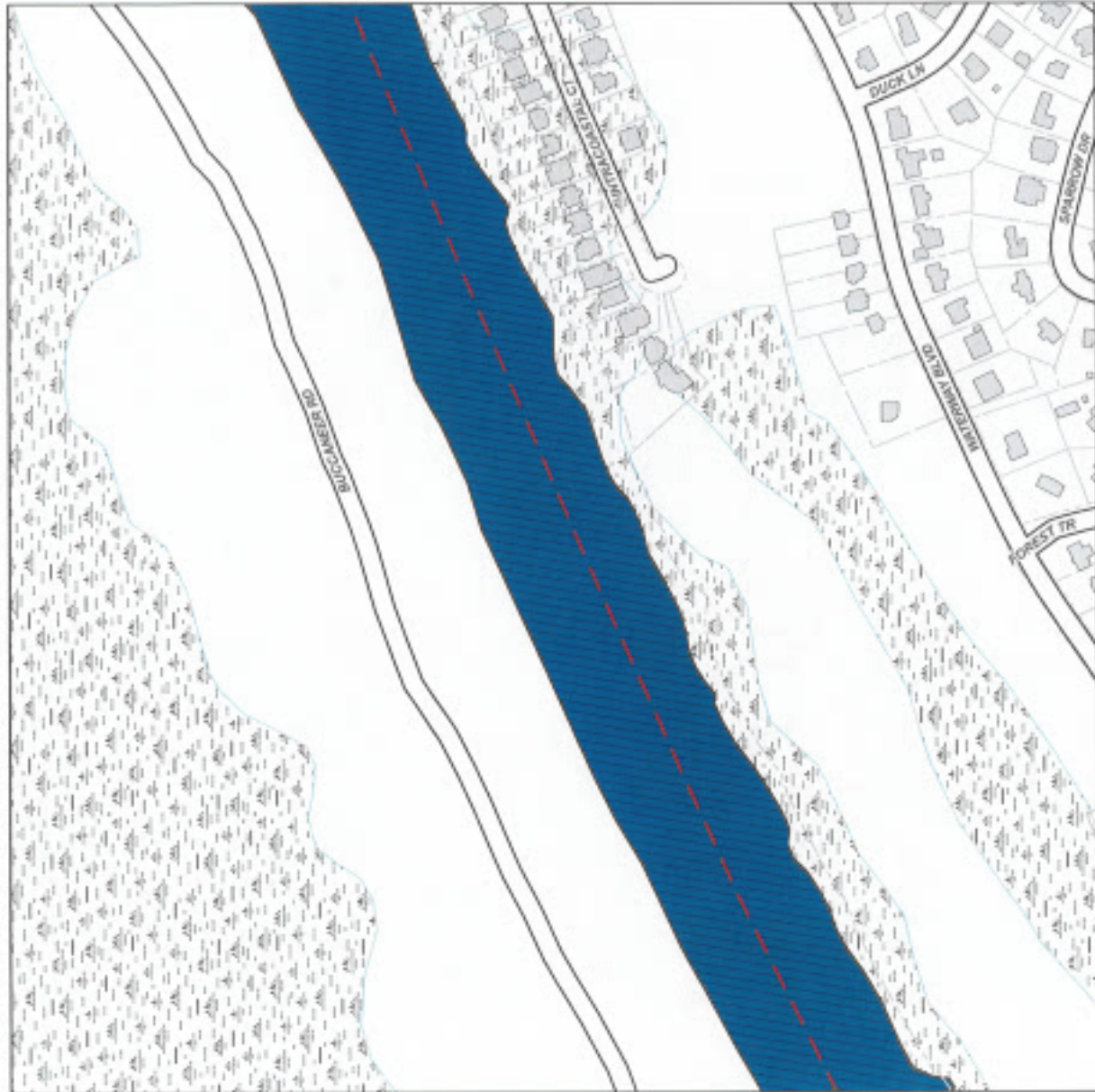


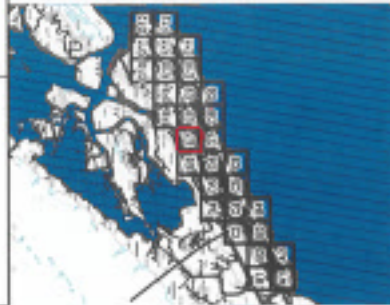
NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





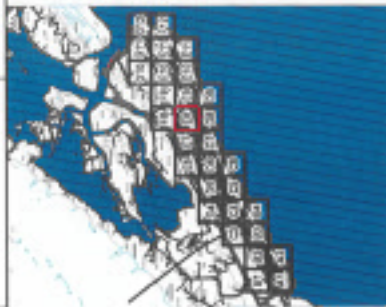
NOTES:

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





NOTES

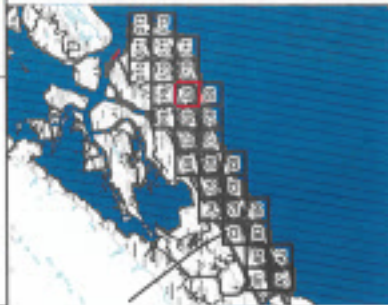
1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh








NOTES:

1. Existing enclosure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



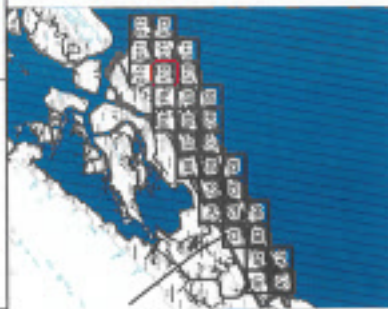
City of Isle of Palms, South Carolina  
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Appendix B

Sector F10

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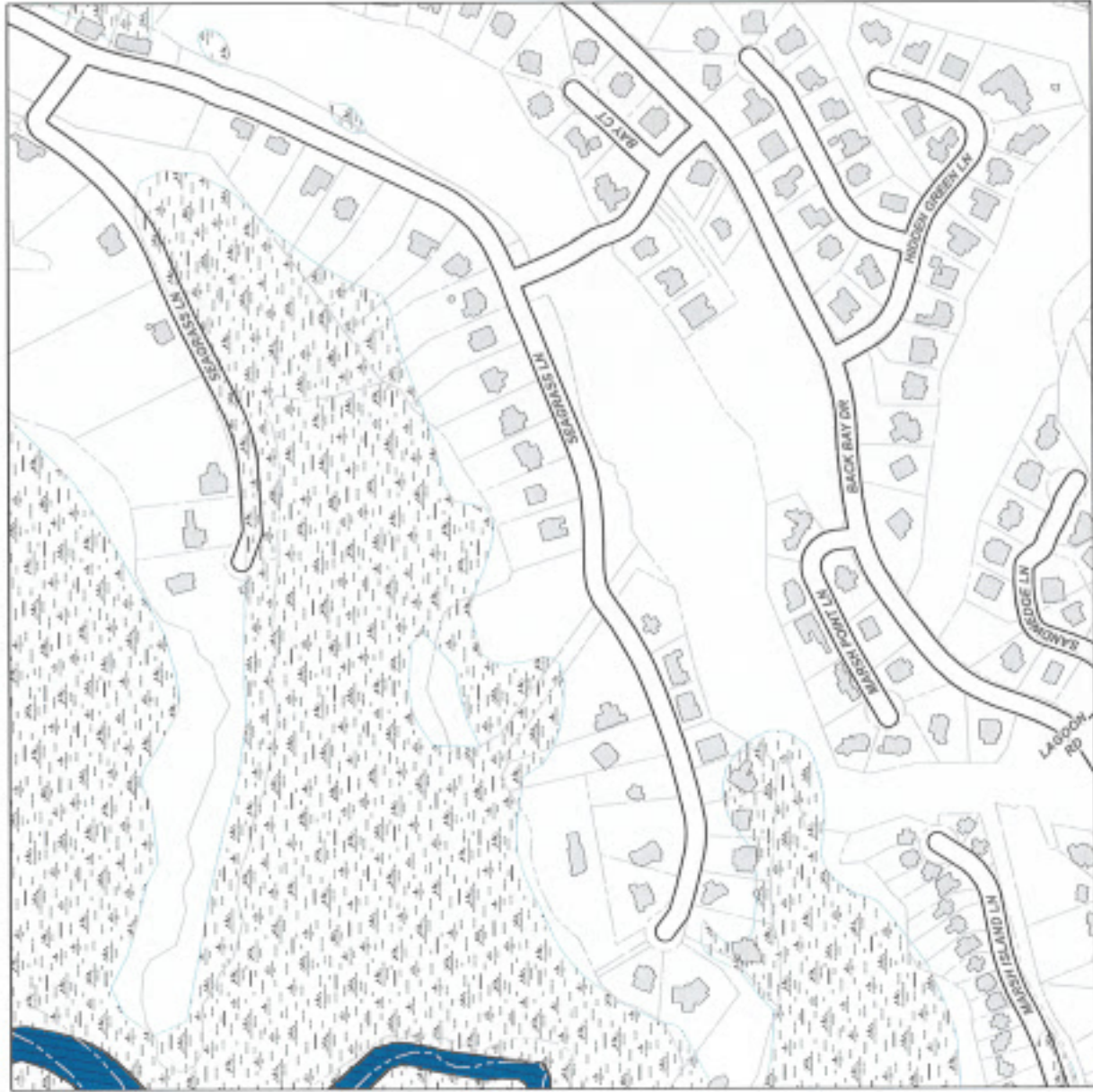


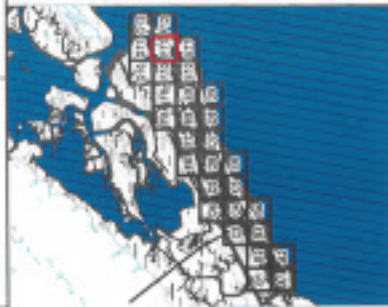
NOTES:

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2016 Sewer Master Plan and may not account for recent improvements.

Legend

-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh





NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2015 Sewer Master Plan and may not account for recent improvements.

Legend

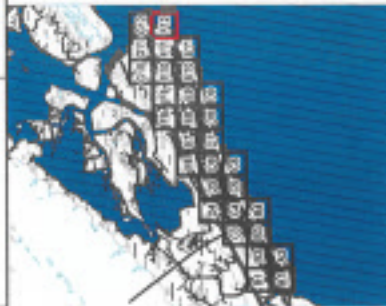
-  Study Boundary
-  Existing Structure
-  Parcel Boundary
-  Areas on Septic
-  Roadway
-  Waterway
-  Marsh



City of Isle of Palms, South Carolina  
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NOTES

1. Existing structure and parcel boundary locations are approximate.
2. Service area boundaries delineated based on 2015 Sewer Master Plan and may not account for needed improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



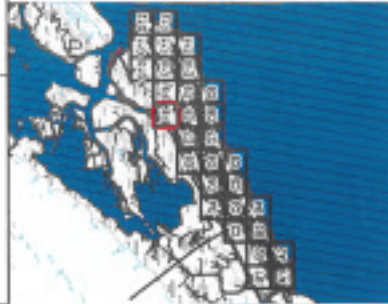
City of Isle of Palms, South Carolina  
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Appendix B

Sector F8

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NOTES

1. Existing structures and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



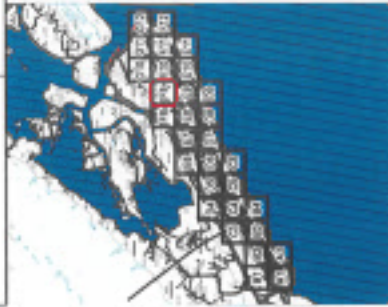
City of Isle of Palms, South Carolina  
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Appendix B

Sector F9

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NOTES

- Existing structure and parcel boundary locations are approximate.
- Septic service boundaries delineated based on 2015 Sewer Master Plan and may not account for recent improvements.

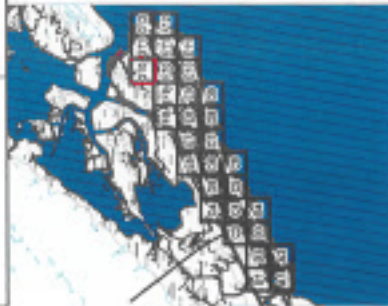
Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



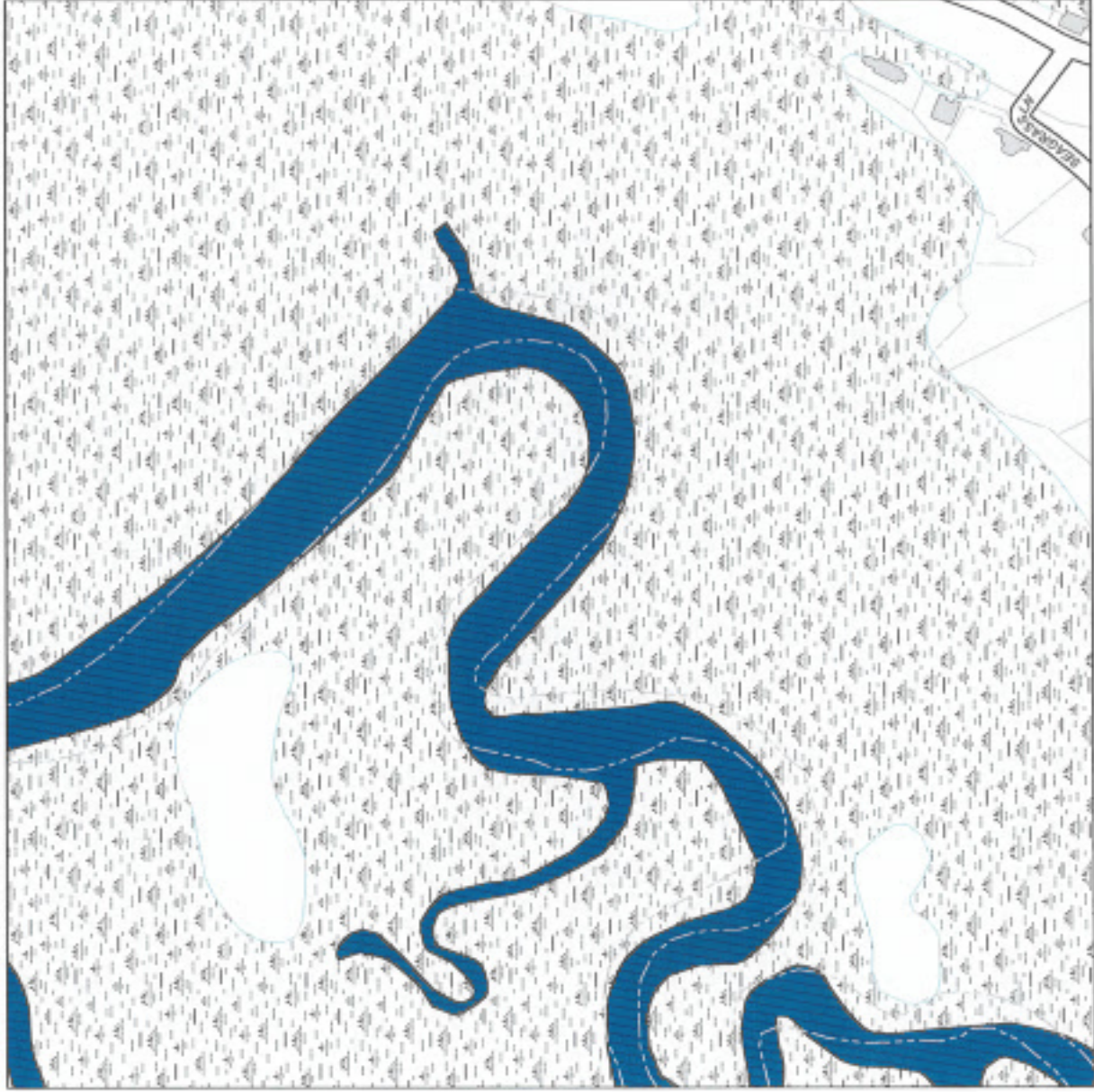
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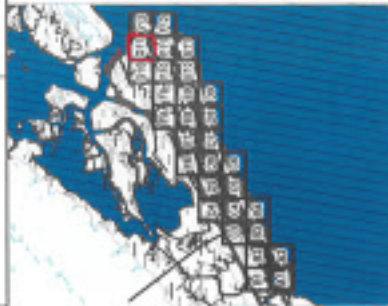
1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh



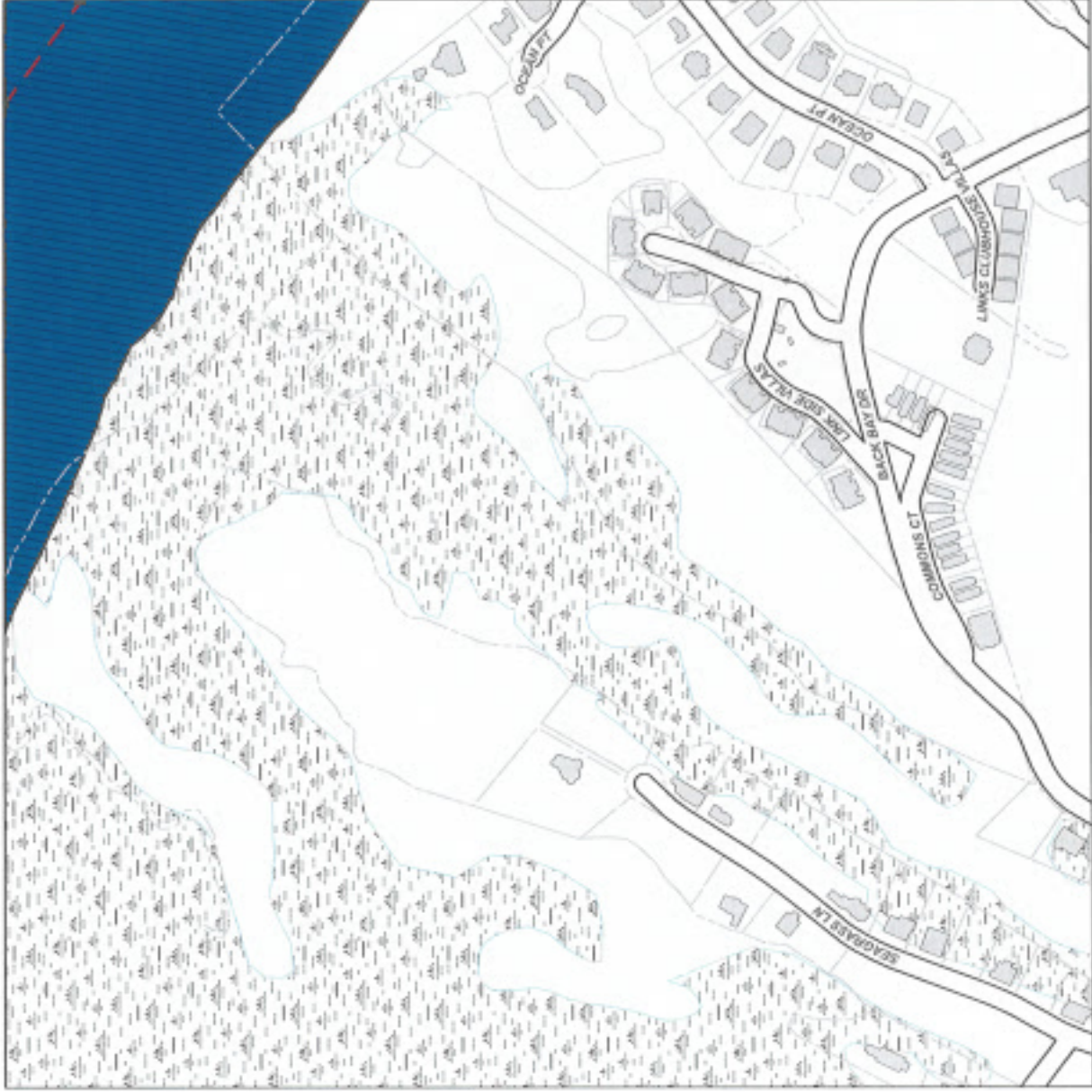


NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2018 Sewer Master Plan and may not account for recent improvements.

Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh





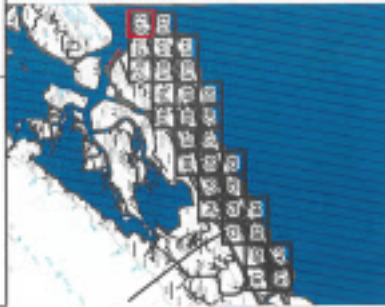
City of Isle of Palms, South Carolina  
Sea Level Rise Adaptation Plan

Vulnerability Analysis  
Sewer Master Plan Supplementary Data

Appendix B

Sector G12

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NOTES:

1. Existing structure and parcel boundary locations are approximate.
2. Septic service boundaries delineated based on 2019 Sewer Master Plan and may not account for recent improvements.



Legend

- Study Boundary
- Existing Structure
- Parcel Boundary
- Areas on Septic
- Roadway
- Waterway
- Marsh

