

# Sea Level Affecting Marshes Model (SLAMM) Maps

## *North Kingstown*

North Kingstown Map Panels		
41	57	79
42	63	83
47	64	88
48	69	89
53	74	

The Rhode Island Coastal Resources Management Council (CRMC) and its partners have developed Sea Level Affecting Marshes Model (SLAMM) Maps for the coastal wetlands of all 21 Rhode Island coastal communities. The purpose of these SLAMM maps is to show how coastal wetlands will likely transition and migrate onto adjacent upland areas under projected sea level rise scenarios of 1, 3 and 5 feet in the coming decades. These maps are intended to support state and local community planning efforts and to help decision makers prepare for and adapt to future coastal wetland conditions despite the inherent uncertainties associated with future rates of sea level rise.

The SLAMM maps were developed using a digital wetlands coverage derived from the 2010 National Wetlands Inventory for Rhode Island. The elevation data used in the model was developed from the 2011 USGS LIDAR elevation dataset. These maps were developed using the “protection off” mode for the model simulations, thereby depicting the highest potential for marsh migration despite current limitations such as parking lots, roads or other development. In this way the maps illustrate opportunities for conservation and potential land modification to enhance wetland migration and restoration. The SLAMM data do not consider natural processes such as coastal erosion or the impacts of coastal storms that can have significant influence on shoreline location and sediment dynamics. Despite these limitations the data still provide a valuable tool to identify those places that provide the best opportunity for future saltmarsh habitat and conservation priorities, and provide valuable information to help plan for new development and infrastructure. Additional map parameters, data sources and caveats can also be found at [www.crmc.ri.gov](http://www.crmc.ri.gov)

These SLAMM maps are Geographic Information System (GIS)-based map images exported as PDF files to reduce file size and ease of access. In total there are 149 map panels that cover the entire Rhode Island shoreline and each panel has four maps showing the initial (current) wetland condition followed by 1, 3, and 5-feet of sea level rise scenarios.

No warranty is expressed or implied by the CRMC and its SLAMM project partners related to the spatial accuracy of these maps and promote no other use of these maps and data other than as a planning tool. These maps should not be used for, and are not intended for, survey and engineering purposes. The data do not take the place of a legal survey or other primary source documentation. They were created for general reference, informational, planning, and guidance use. They are not a legally authoritative source as to the exact location of natural or manmade features.

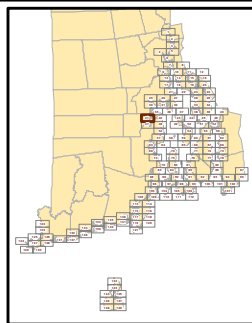
These maps can be examined at the Council’s office in Wakefield, at the Secretary of State’s office, and on-line at the Council’s website: [www.crmc.ri.gov](http://www.crmc.ri.gov).







Map  
41



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- |                    |                                |
|--------------------|--------------------------------|
| Developed Upland   | Salt Marsh                     |
| Undeveloped Upland | Brackish Marsh                 |
| Rocky Intertidal   | Scrub/Shrub Transitional Marsh |
| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

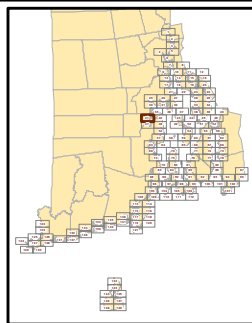
## Tidal Marsh Vulnerability Analysis: Current Condition







Map  
41



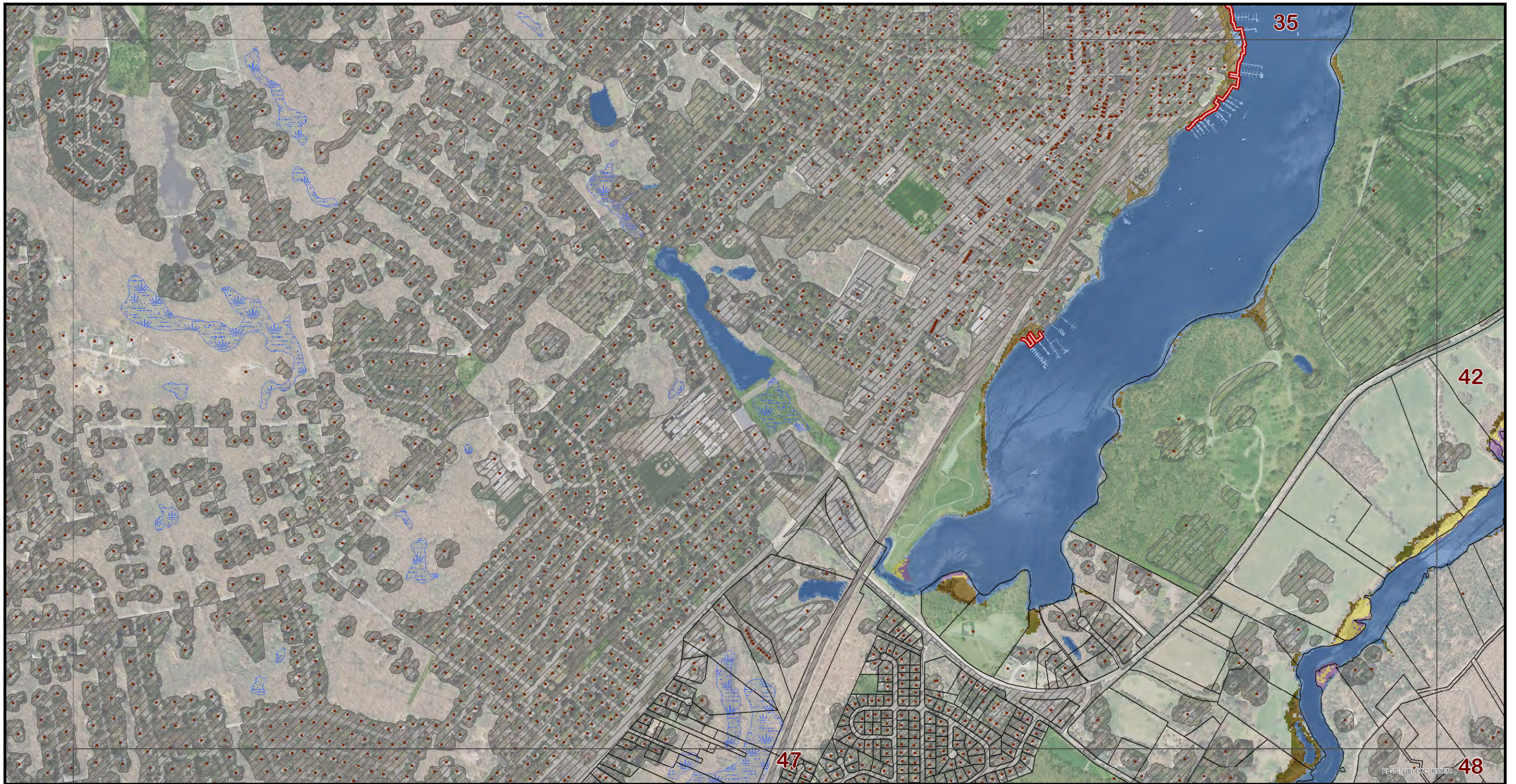
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-  Potential Marsh Zone
-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

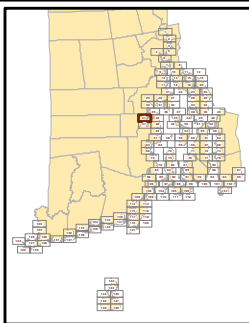
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model


















Map  
41



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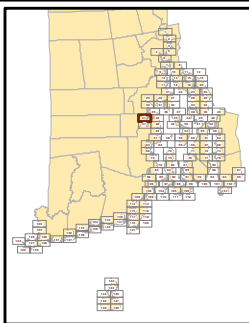
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
41



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## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model

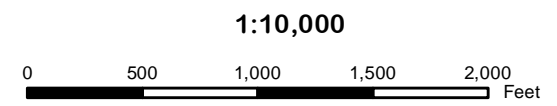
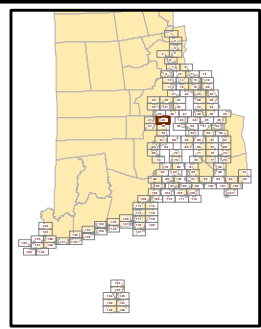






RIGIS, URI EDG, RDEM

Map 42



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| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

# Tidal Marsh Vulnerability Analysis: Current Condition



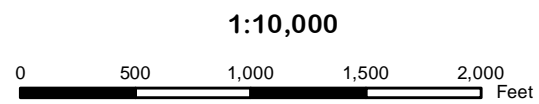
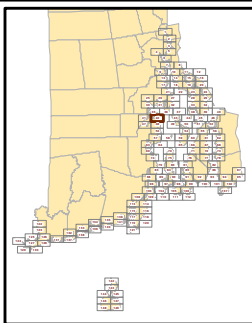
Map produced by Kevin Ruddock. 4/2/2014
















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Map 42



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## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



NOAA grant award #: NA120AR4310108

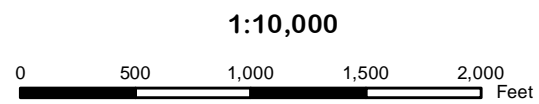
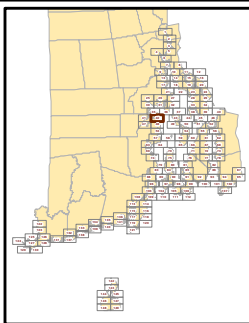
Map produced by Kevin Ruddock. 4/1/2014





RIGIS, URI EDG, RDEM

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## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



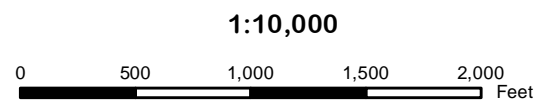
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
42



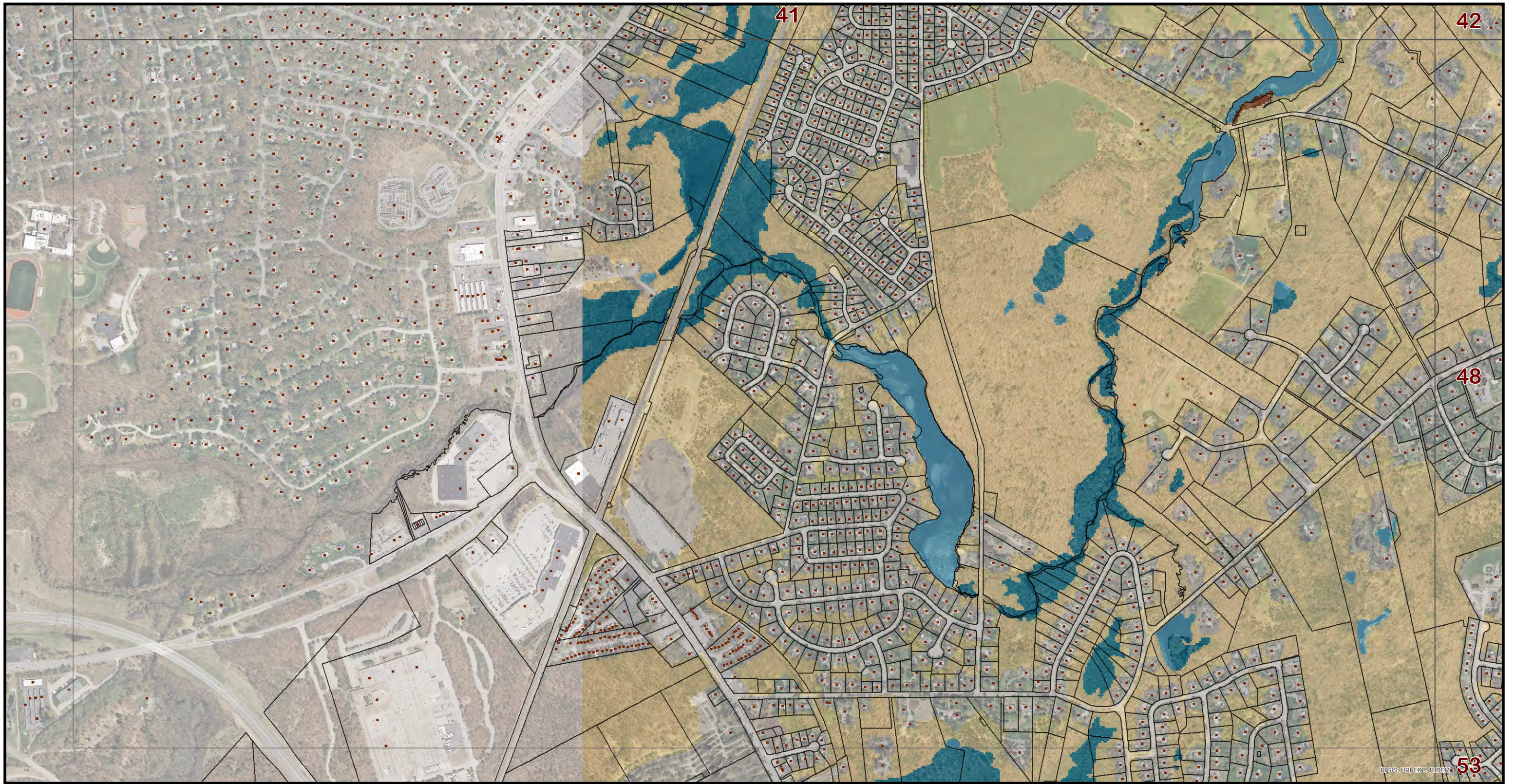
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- |  |                           |  |                       |
|--|---------------------------|--|-----------------------|
|  | Potential Marsh Zone      |  | Hardened Shores       |
|  | Persistent Marsh Zone     |  | Buildings             |
|  | Potential Marsh Loss      |  | Parcel Boundaries     |
|  | Open Water and Tidal Flat |  | Developed Land        |
|  | Current Fresh Wetlands    |  | CRMC Coastal Barriers |
|  | Protected Open Space      |  |                       |

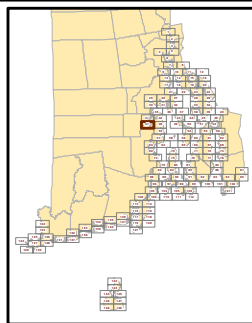
## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model







Map  
47



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| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

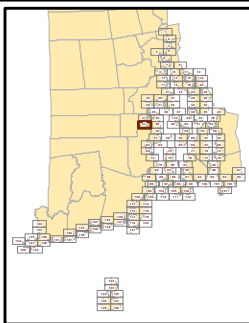
## Tidal Marsh Vulnerability Analysis: Current Condition







Map  
47



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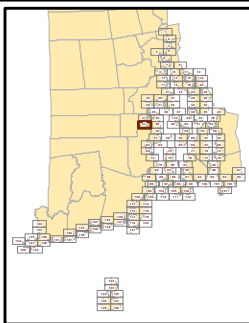
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model


















Map  
47



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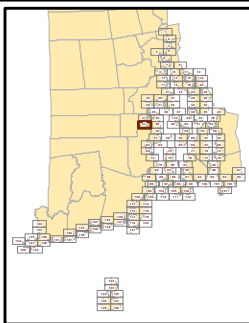
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
47



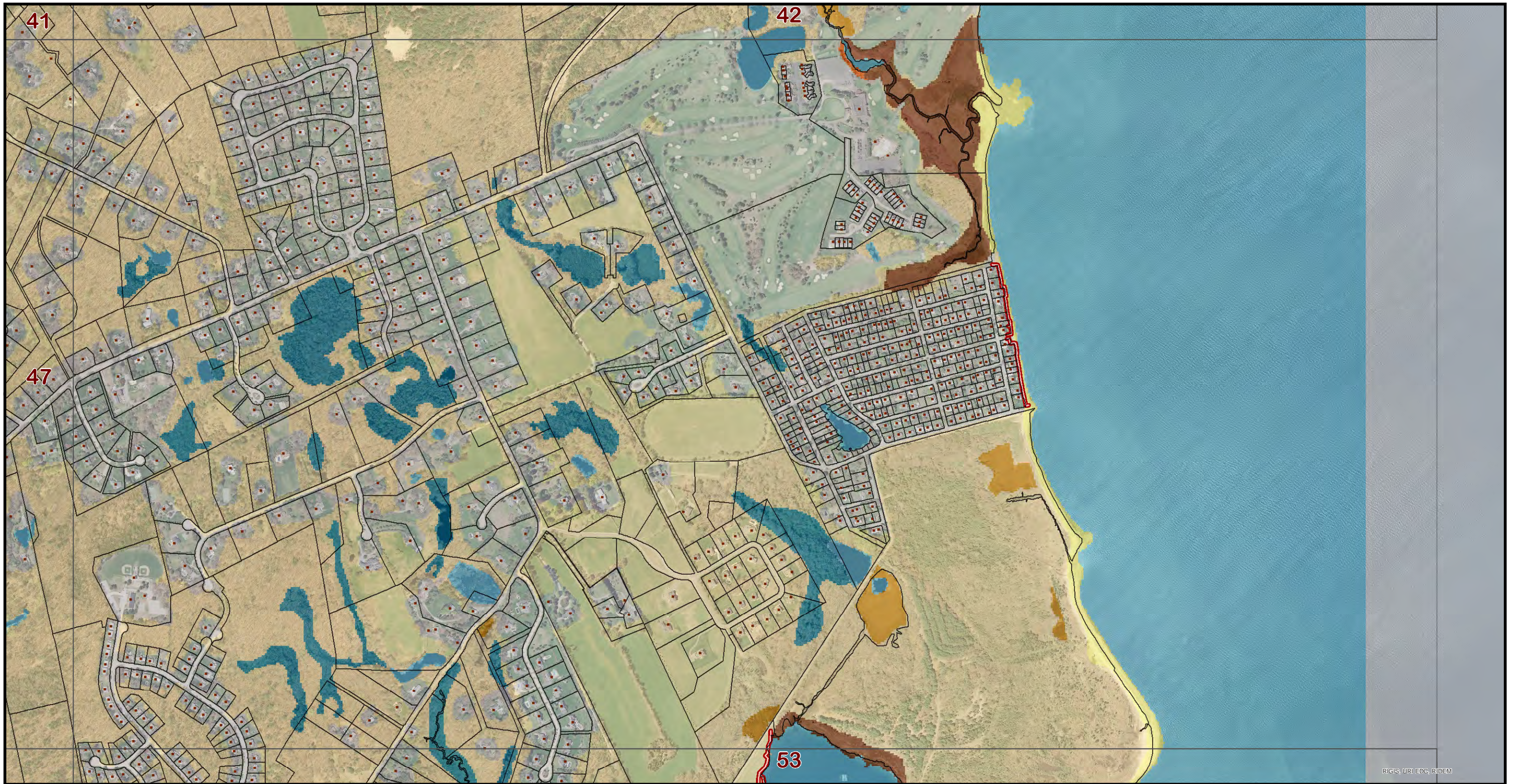
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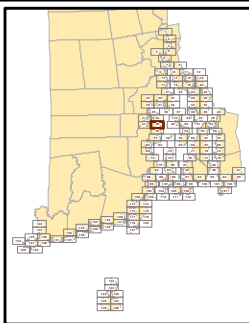




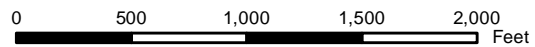


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Map  
48



1:10,000



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| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

## Tidal Marsh Vulnerability Analysis: Current Condition

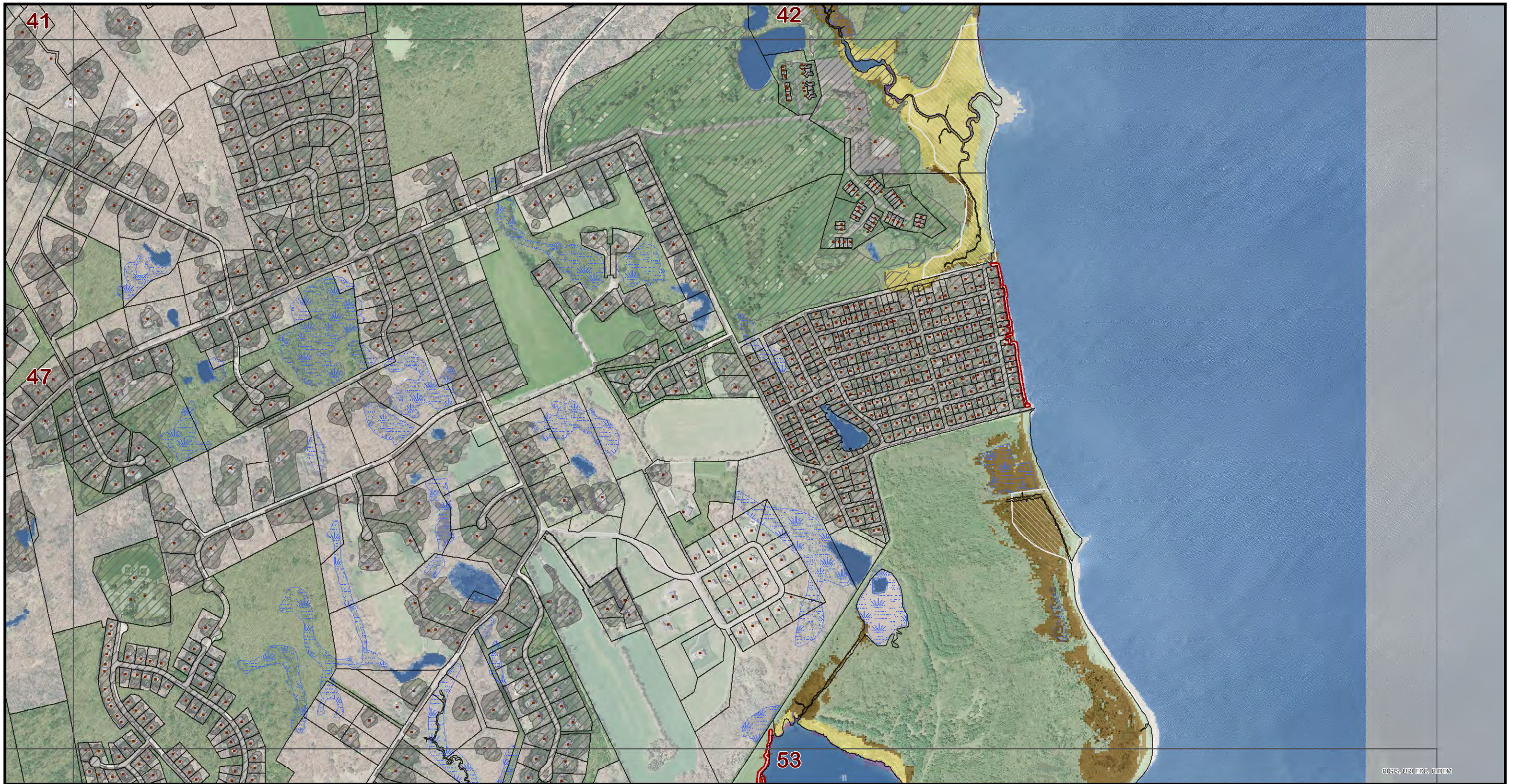


NOAA grant award #: NA12GAR4310108



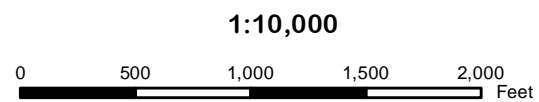
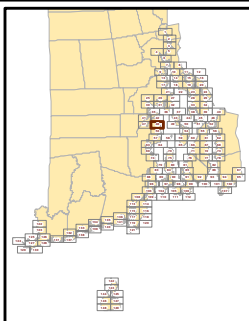
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RIGIS, URI EDG, RDEM

Map  
48



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## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



NOAA grant award #:  
NA120AR4310108

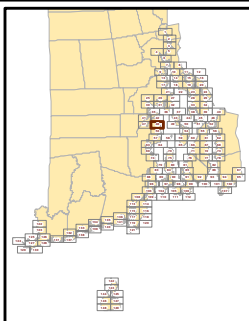
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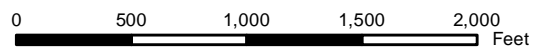


RIGIS, URI EDG, RDEM












Map  
48



1:10,000



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## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



NOAA grant award #:  
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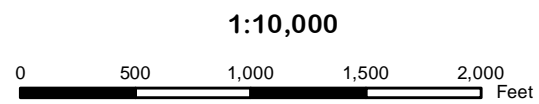
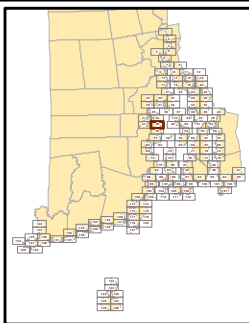
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RIGIS, URI EDG, RDEM

Map  
48



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## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model

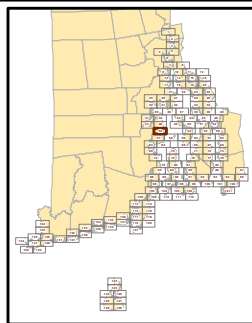


Map produced by Kevin Ruddock. 4/1/2014





Map  
53



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| Tidal Creek        |                                |

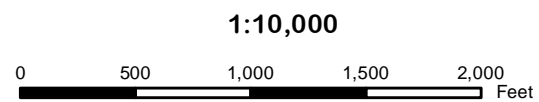
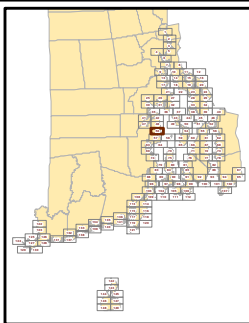
## Tidal Marsh Vulnerability Analysis: Current Condition







Map 53



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## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model

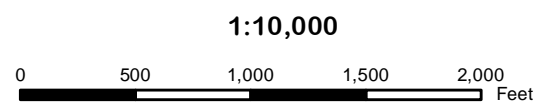
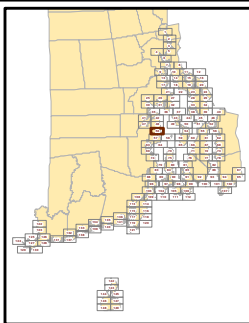


NOAA grant award #: NA120AR4310108
















Map  
53



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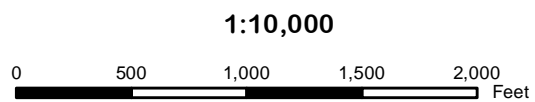
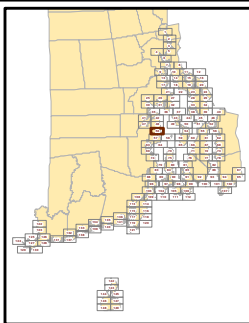
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







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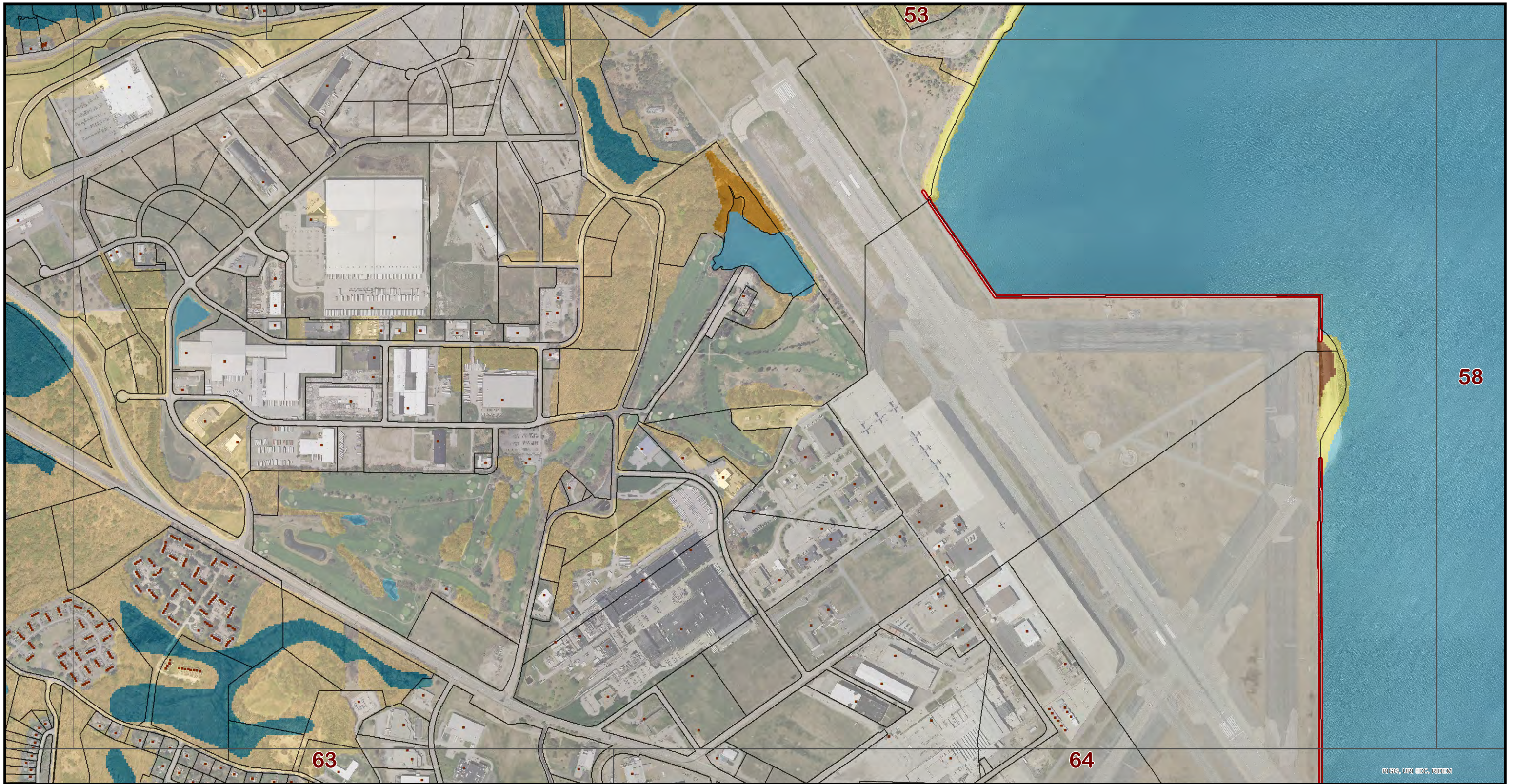
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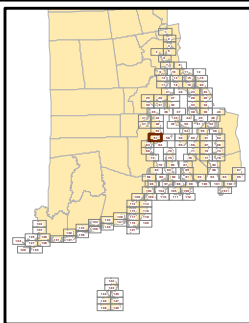


NOAA grant award #: NA120AR4310108





Map  
57



1:10,000

0 500 1,000 1,500 2,000 Feet

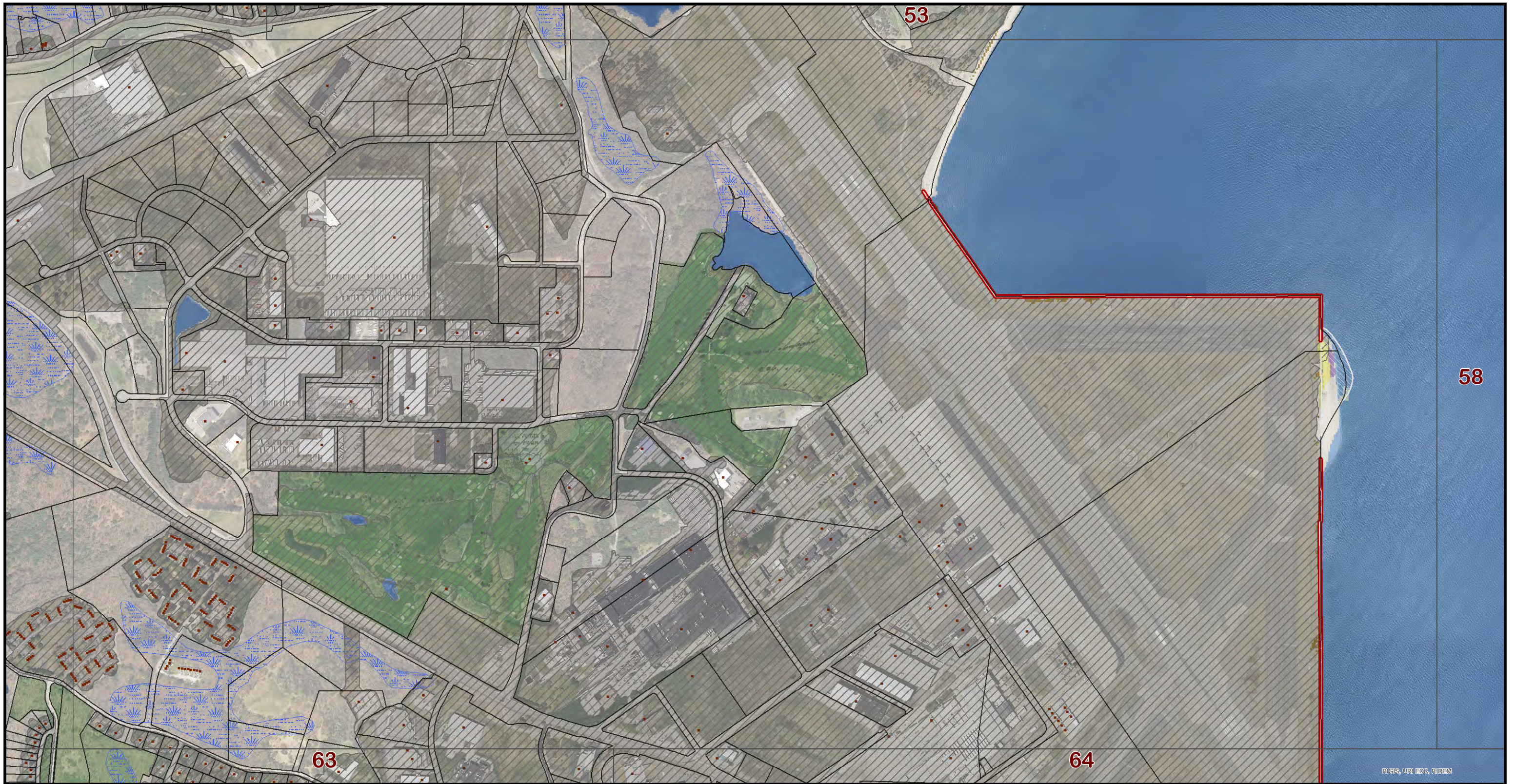
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| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

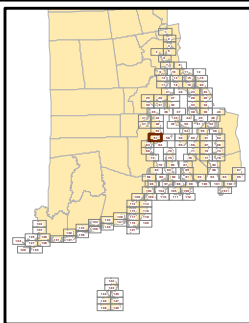
## Tidal Marsh Vulnerability Analysis: Current Condition







Map  
57



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-  Potential Marsh Zone
-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model

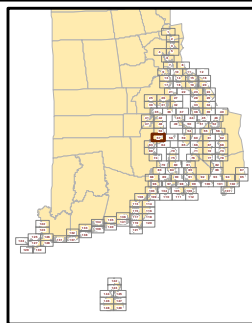


NOAA grant award #:  
NA120AR4310108
















Map  
57



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-  Current Fresh Wetlands
-  Protected Open Space
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-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

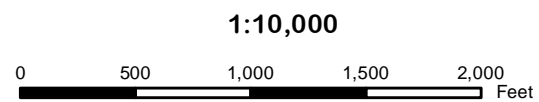
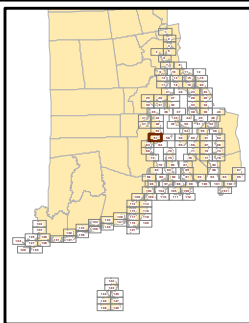
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
57



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-  Potential Marsh Loss
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-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

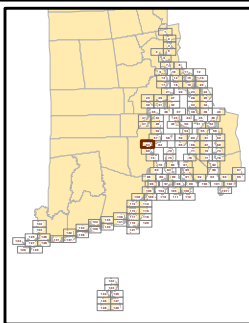
## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model







Map  
63



1:10,000

0 500 1,000 1,500 2,000 Feet

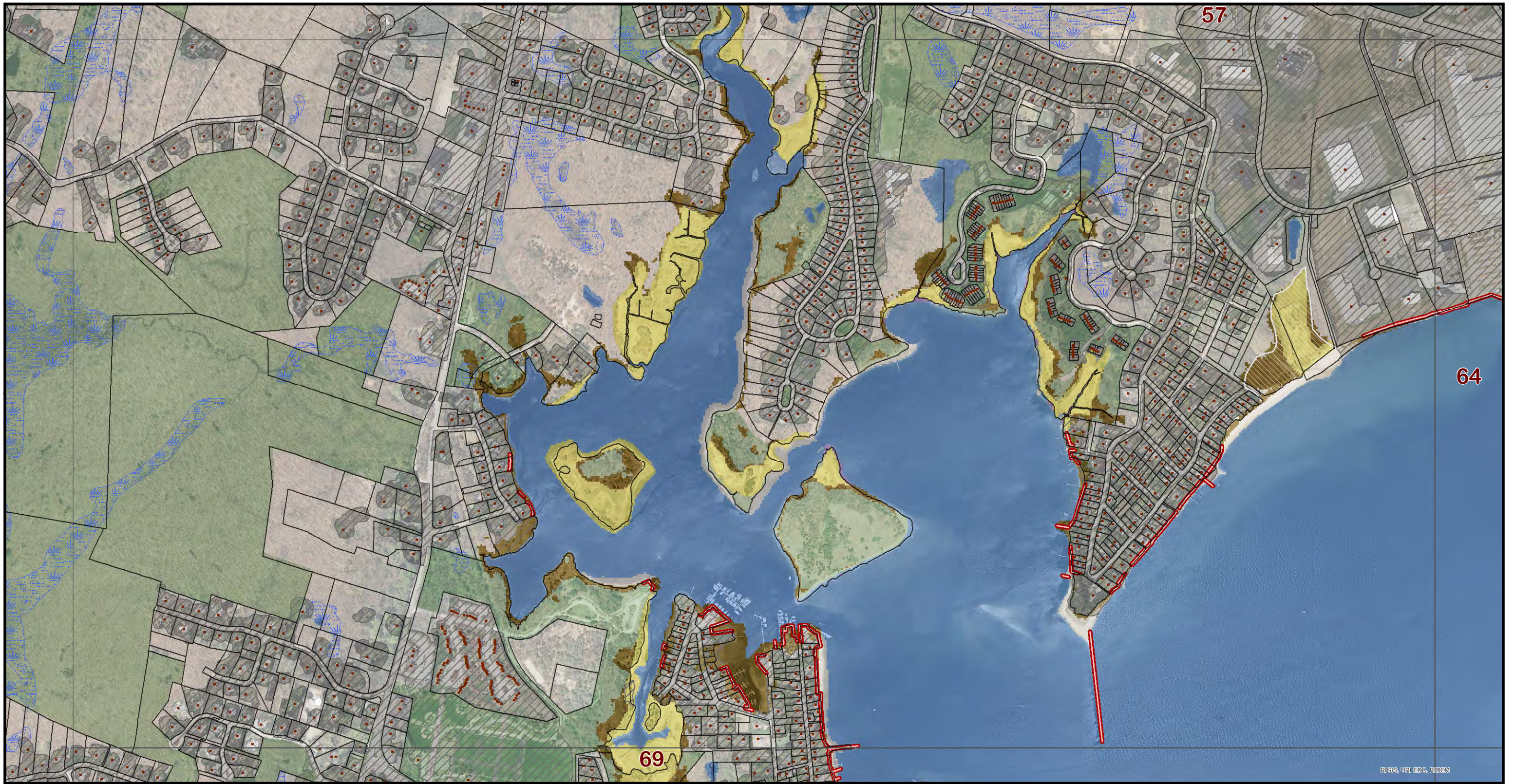
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- |                    |                                |
|--------------------|--------------------------------|
| Developed Upland   | Salt Marsh                     |
| Undeveloped Upland | Brackish Marsh                 |
| Rocky Intertidal   | Scrub/Shrub Transitional Marsh |
| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

## Tidal Marsh Vulnerability Analysis: Current Condition

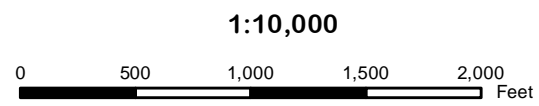
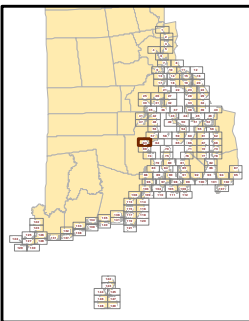
















RTS, URI EDG, RDEM

Map 63



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-  Potential Marsh Zone
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-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

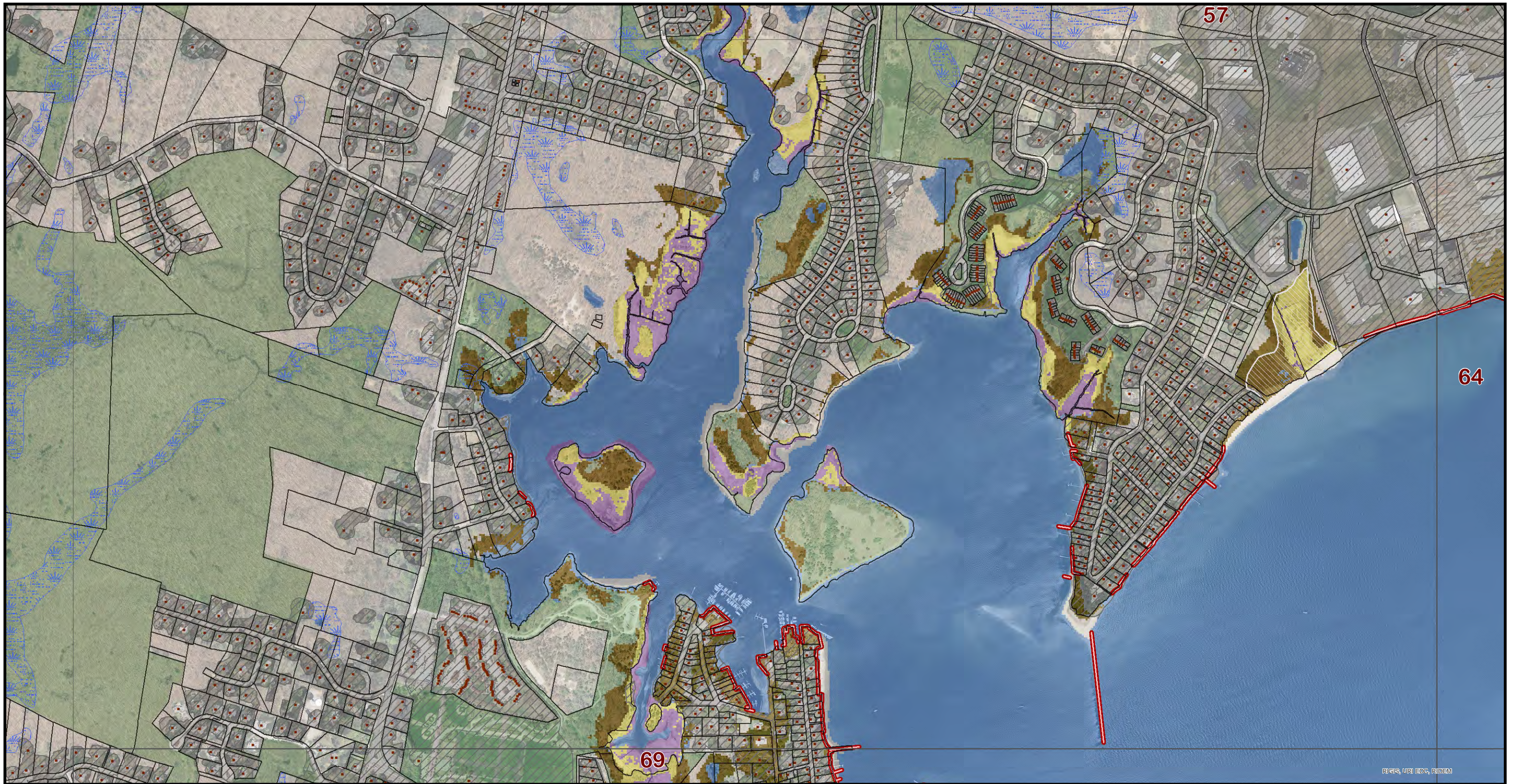
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



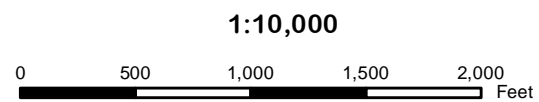
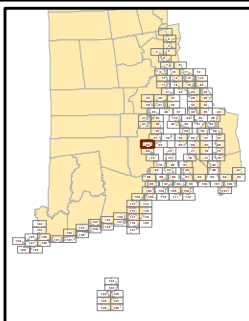
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
63



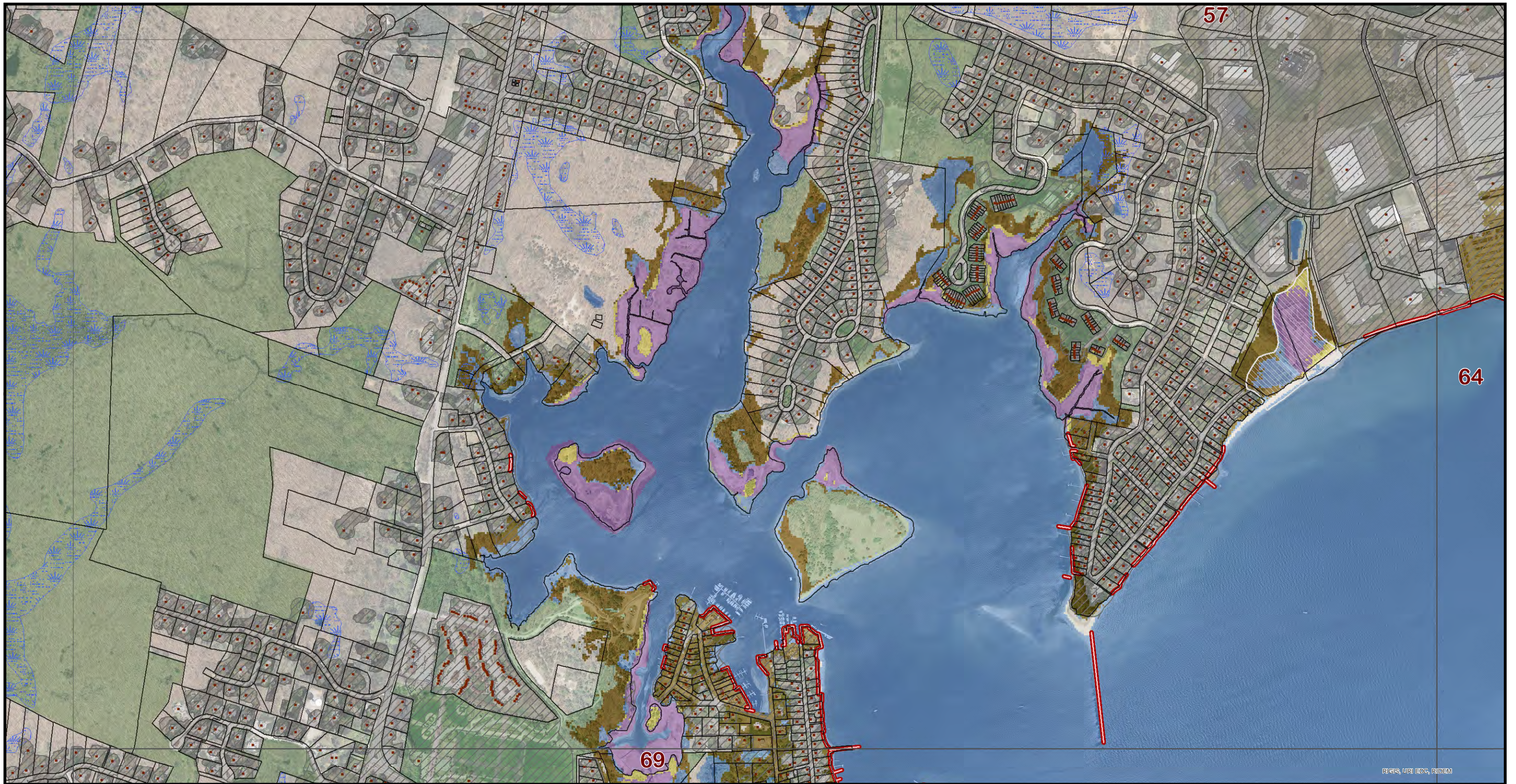
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- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

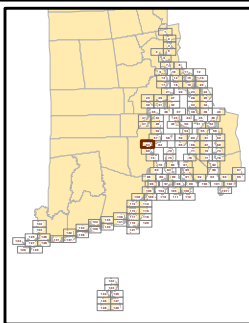
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
63



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-  Potential Marsh Zone
-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model







63

57

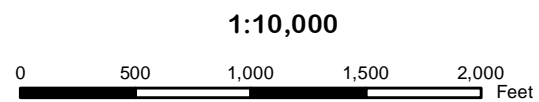
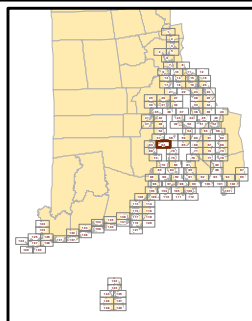
58

69

70

RCS, URI EDC, RIDEM

Map  
64



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- |                    |                                |
|--------------------|--------------------------------|
| Developed Upland   | Salt Marsh                     |
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| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

# Tidal Marsh Vulnerability Analysis: Current Condition

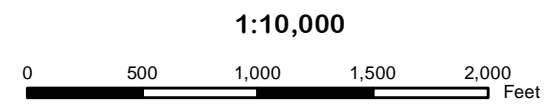
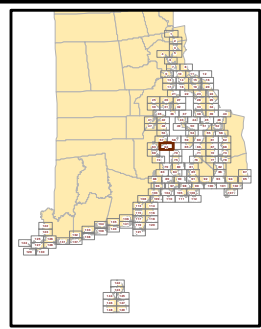


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Map  
64



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- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



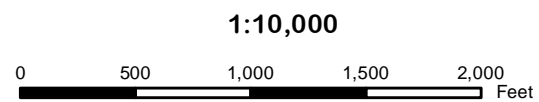
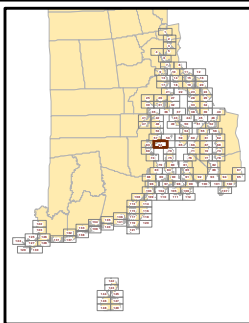
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014
















Map  
64



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-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



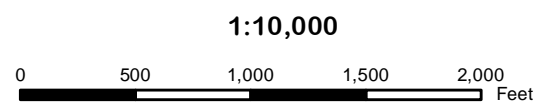
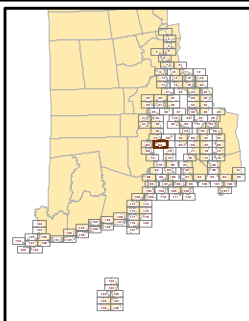
NOAA grant award #:  
NA120AR4310108

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Map  
64



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-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model



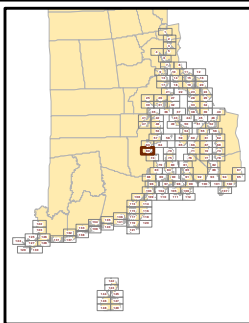
NOAA grant award #:  
NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
69



1:10,000

0 500 1,000 1,500 2,000 Feet

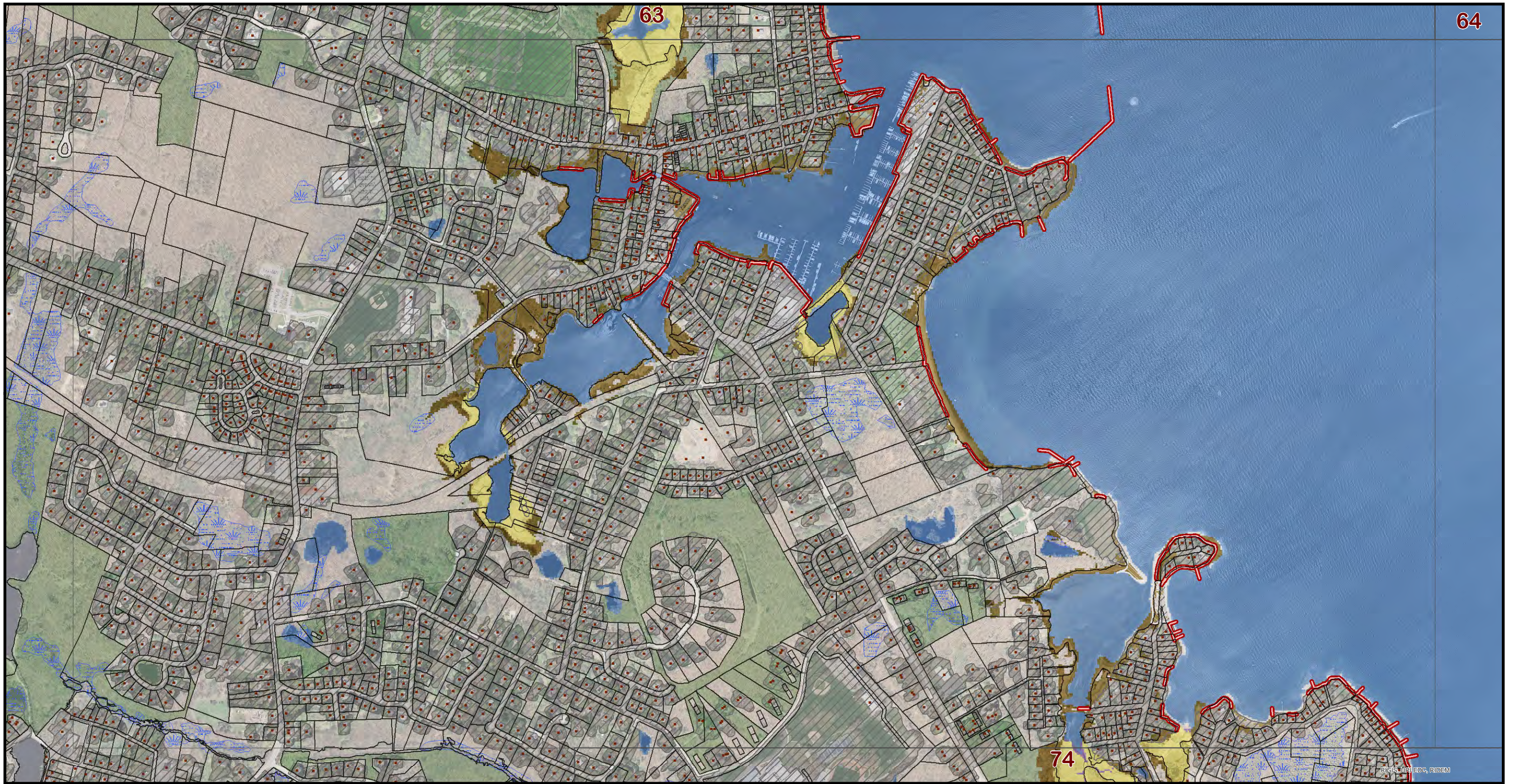
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- |                    |                                |
|--------------------|--------------------------------|
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| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

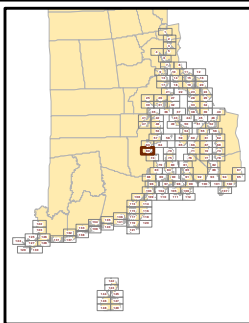
## Tidal Marsh Vulnerability Analysis: Current Condition







Map  
69



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-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

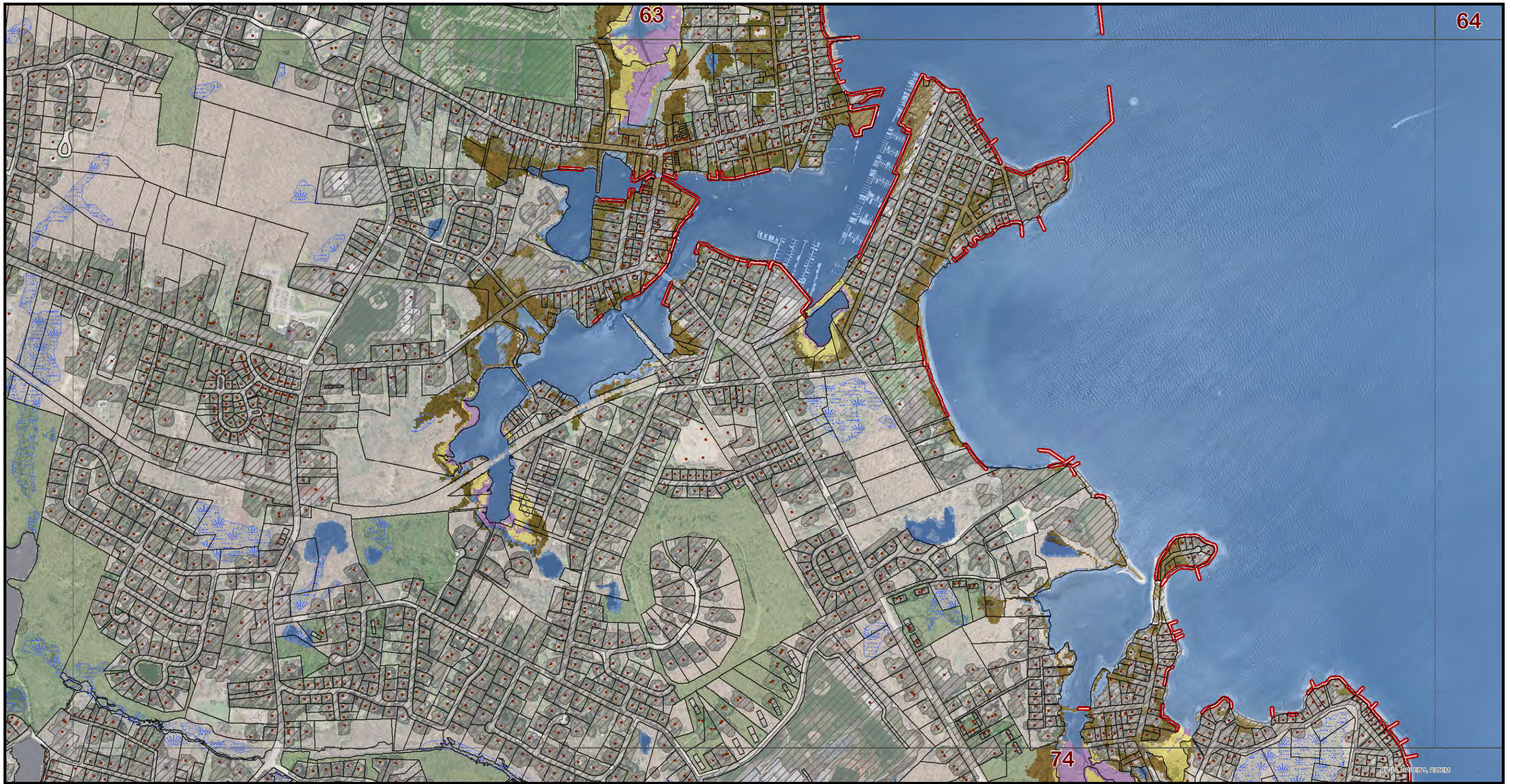
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



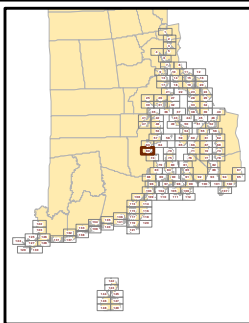
NOAA grant award #:  
NA120AR4310108


















Map  
69



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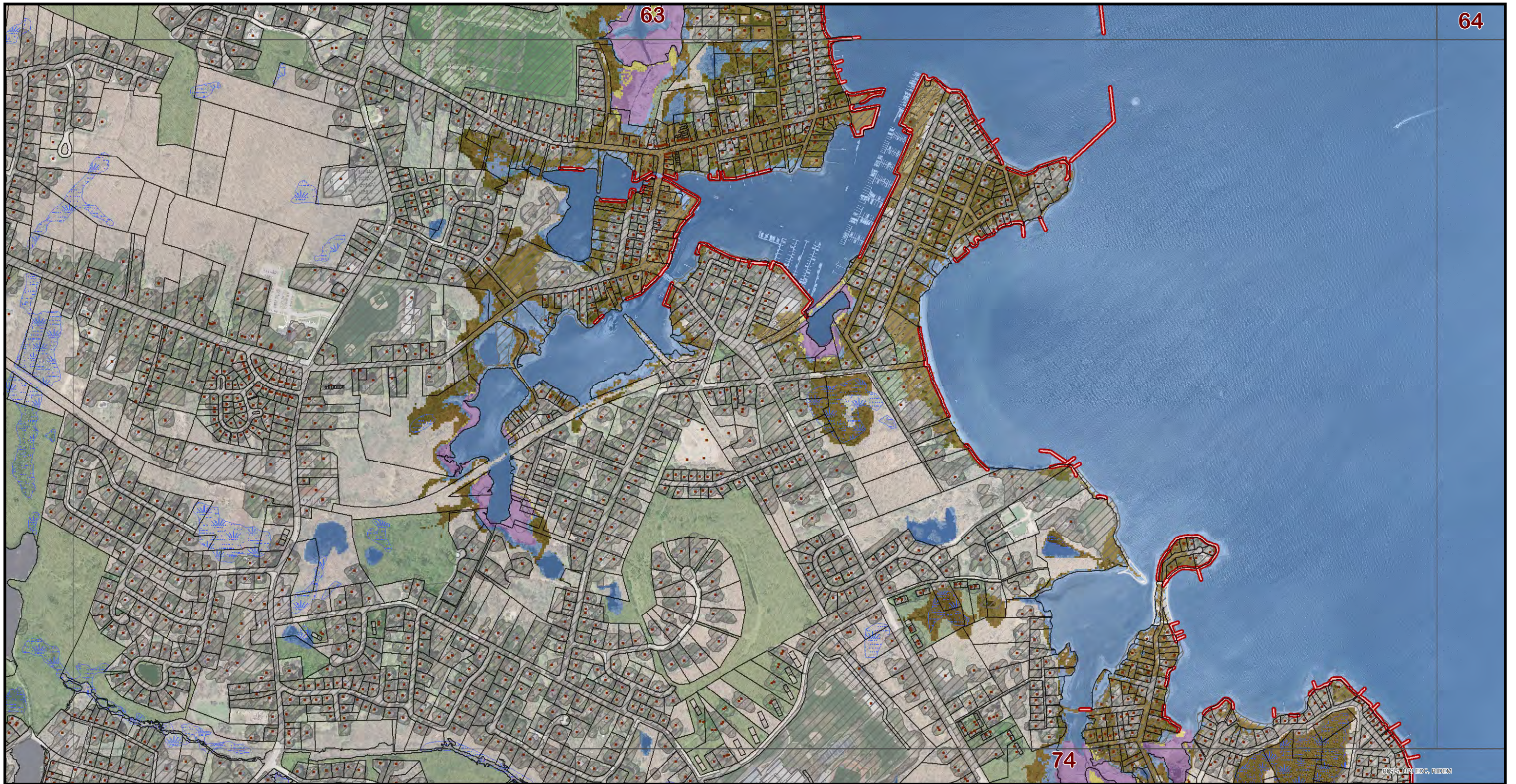
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



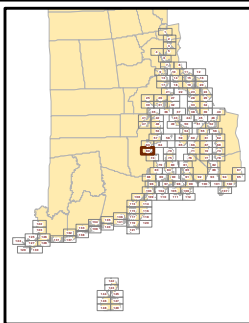
NOAA grant award #:  
NA120AR4310108


















Map  
69



1:10,000

0 500 1,000 1,500 2,000 Feet

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## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model



NOAA grant award #:  
NA120AR4310108



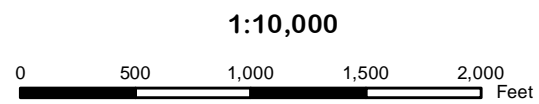
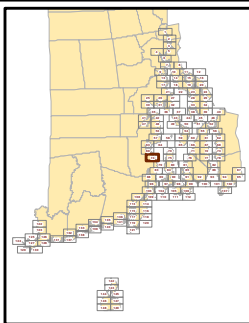
Map produced by Kevin Ruddock. 4/1/2014





RTEIS, URI EDG, RIDEM

Map  
74



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|--------------------|--------------------------------|
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| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

## Tidal Marsh Vulnerability Analysis: Current Condition

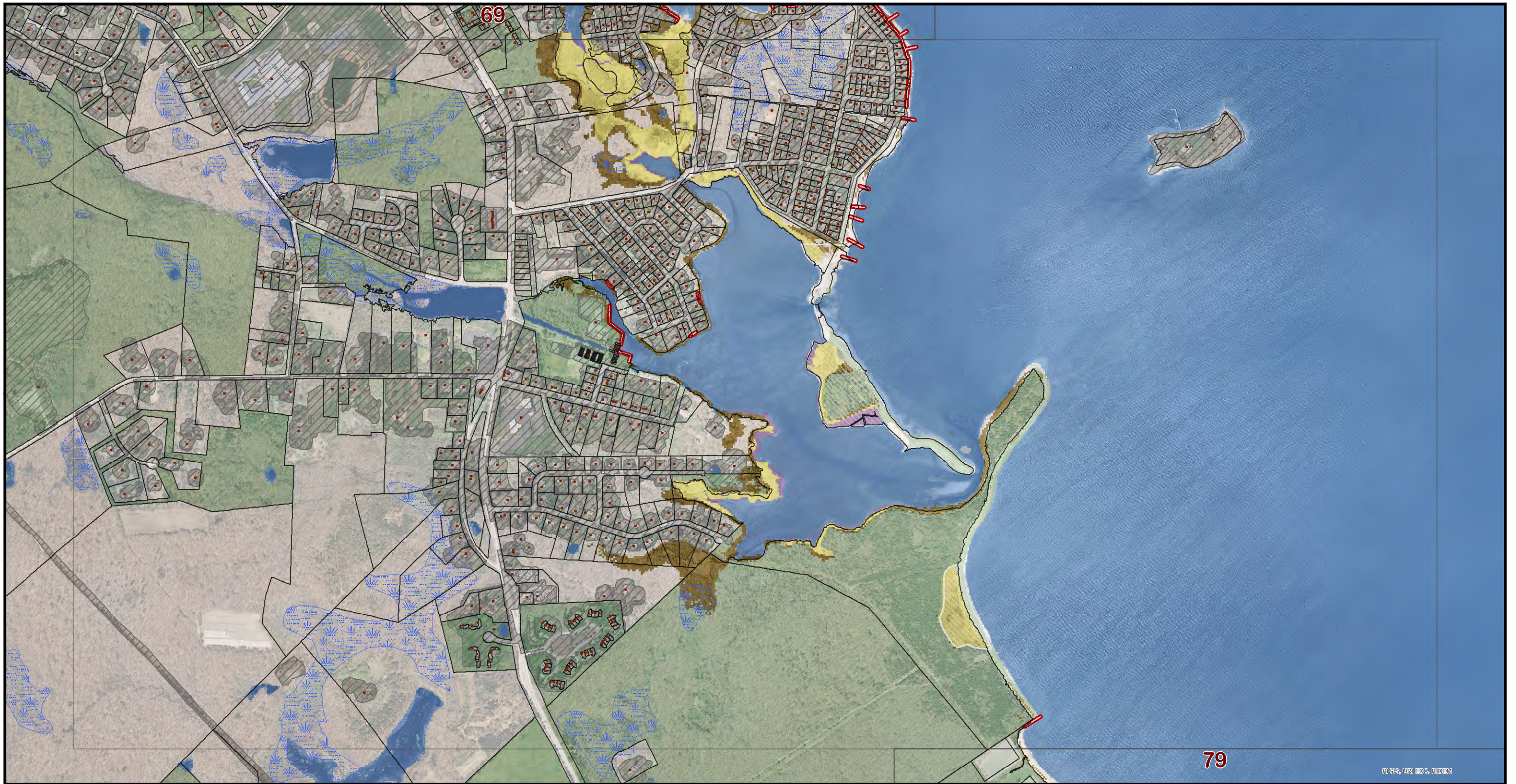


NOAA grant award #:  
NA12GAR4310108

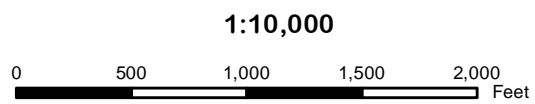
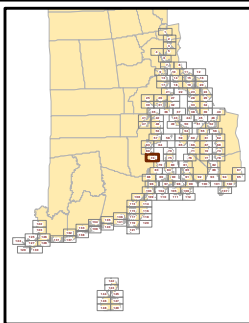


Map produced by Kevin Ruddock. 4/2/2014





Map  
74



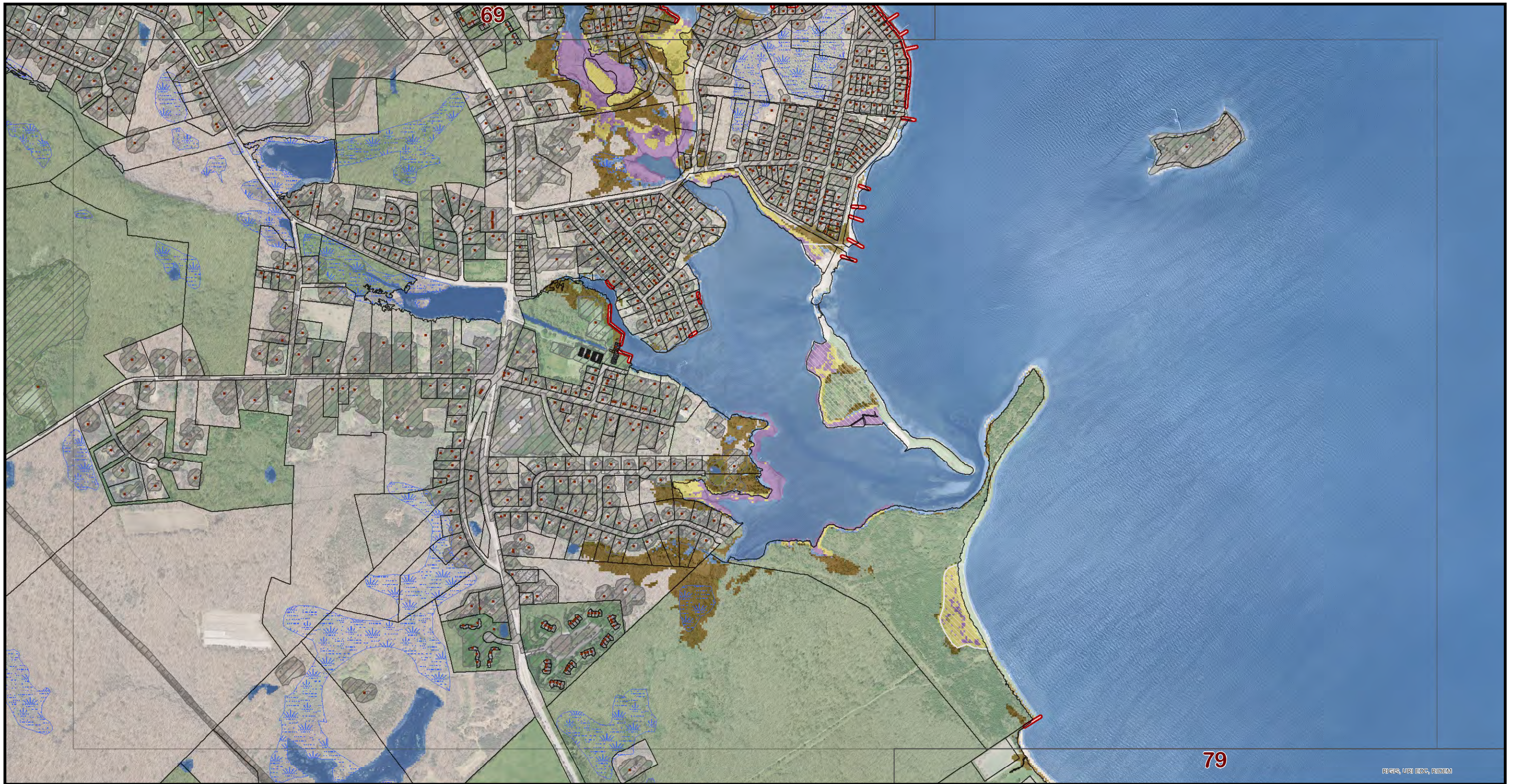
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-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

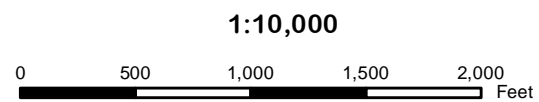
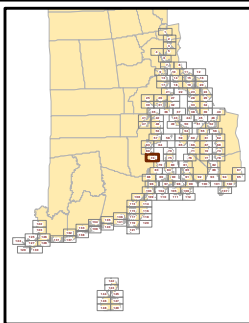
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model


















Map  
74



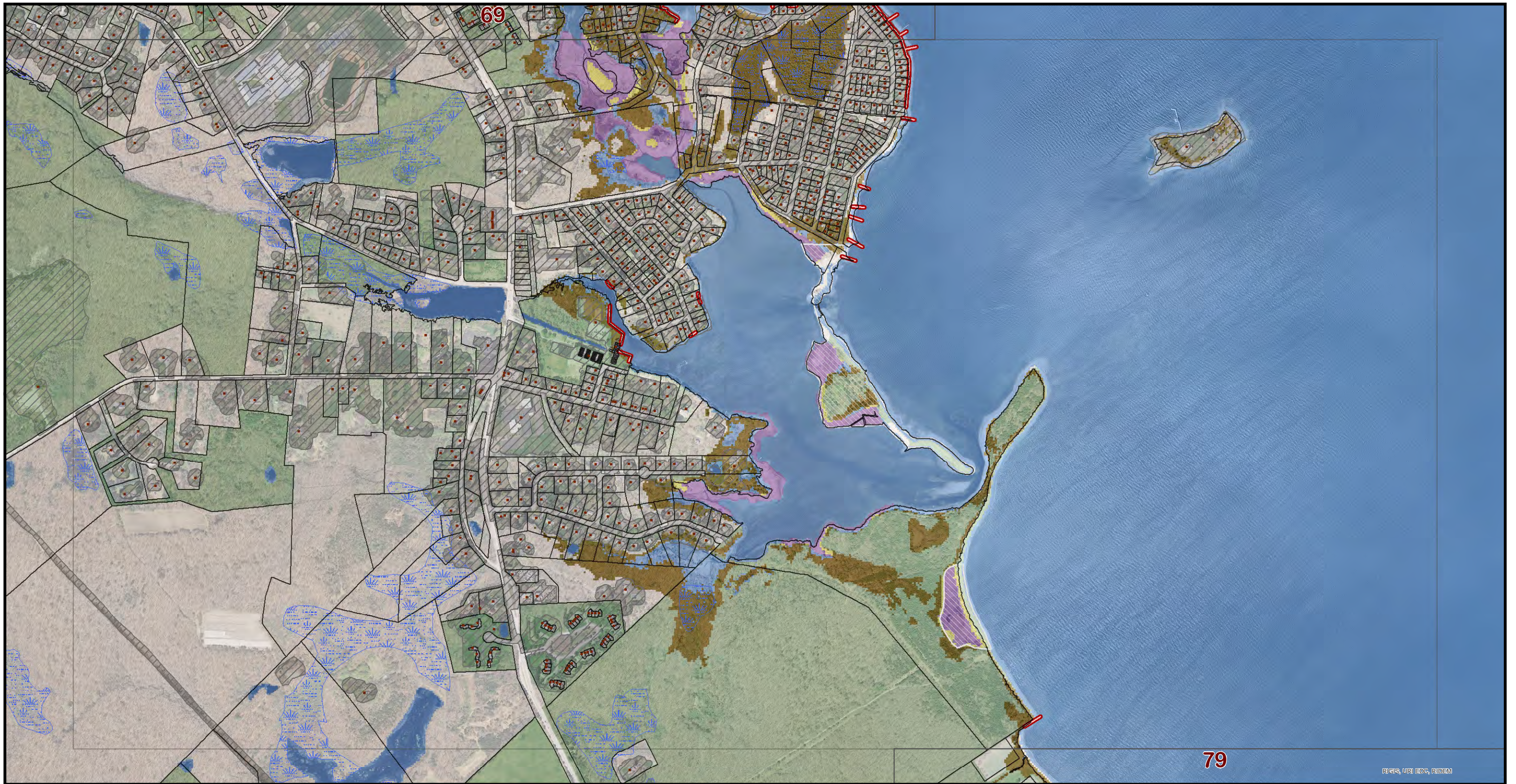
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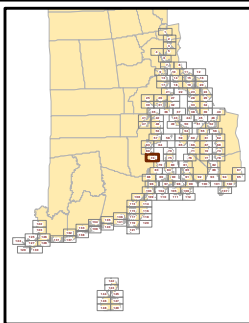
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
74



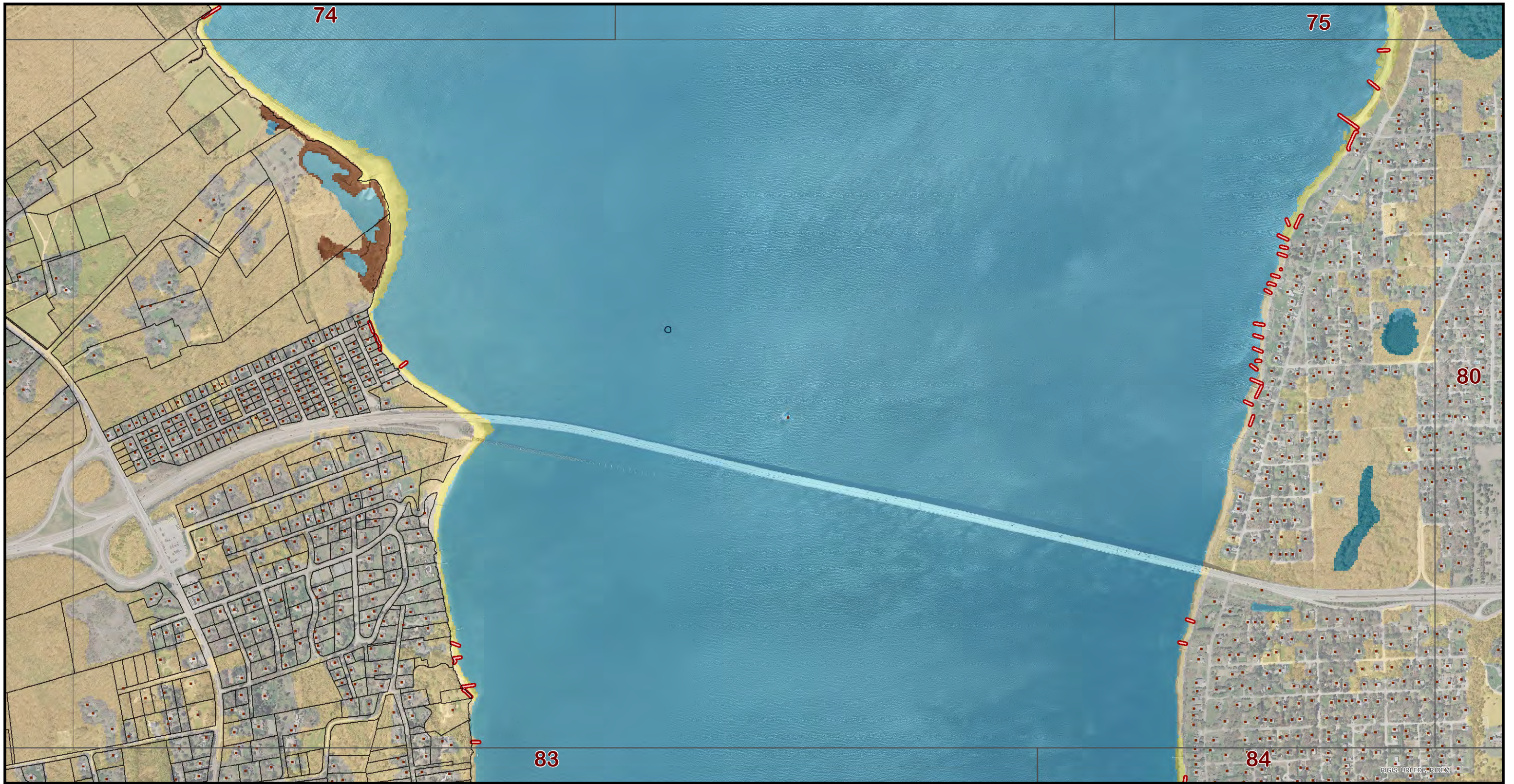
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-  Parcel Boundaries
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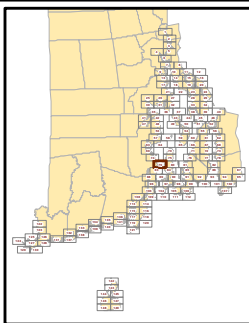
## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model







Map  
79



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- |                    |                                |
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| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

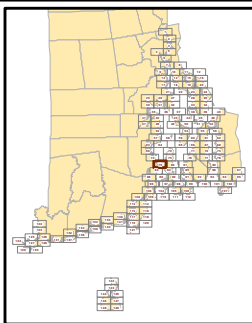
## Tidal Marsh Vulnerability Analysis: Current Condition







Map  
79



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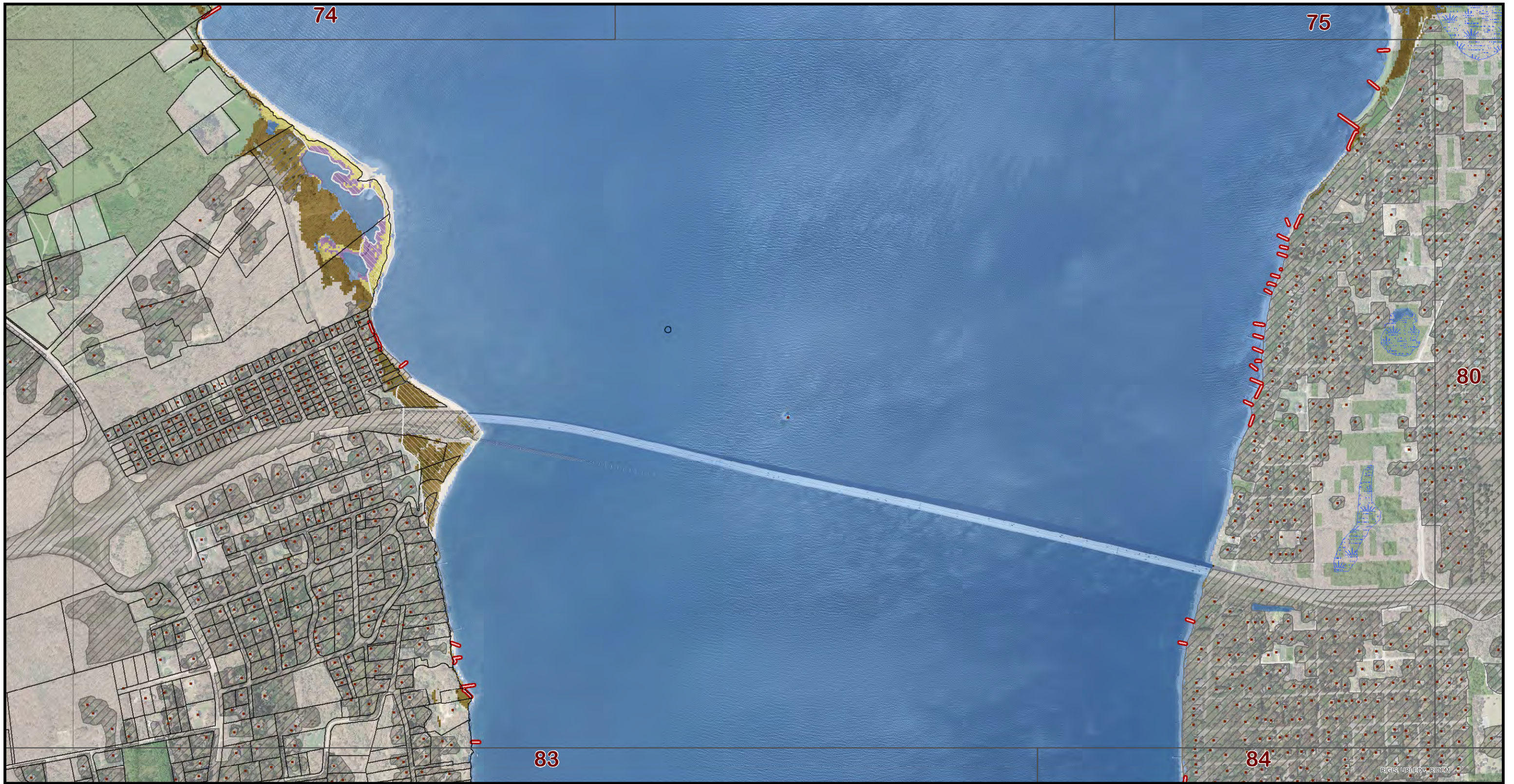
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



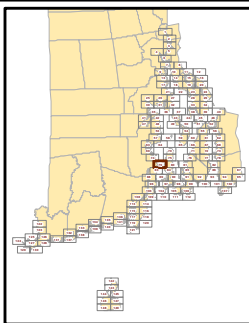
NOAA grant award #:  
NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
79



1:10,000

0 500 1,000 1,500 2,000 Feet

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- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space

- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

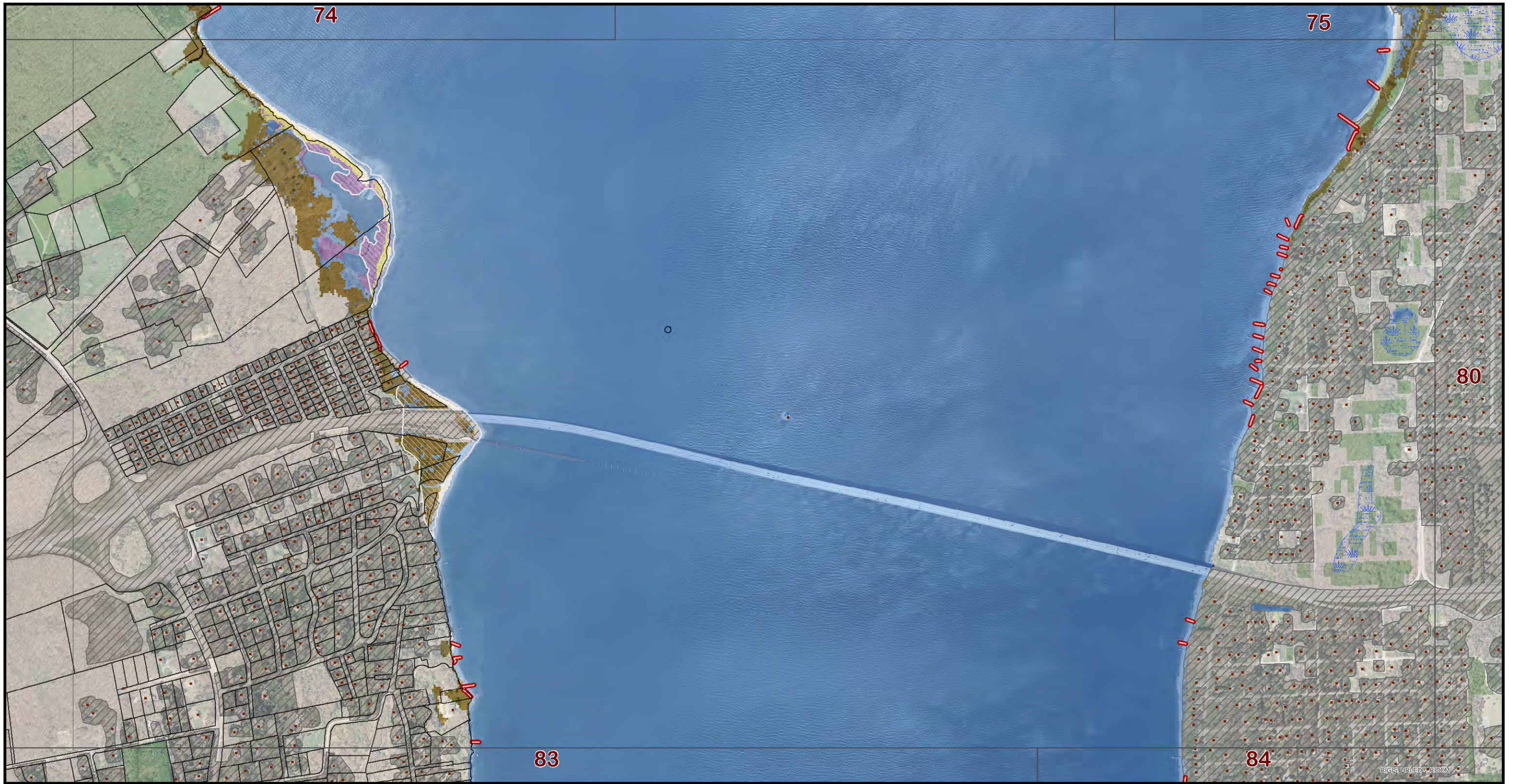
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



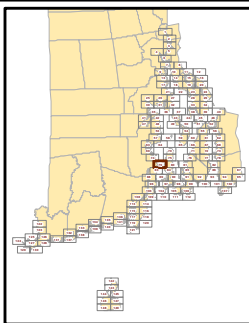
NOAA grant award #:  
NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014
















Map  
79



1:10,000

0 500 1,000 1,500 2,000 Feet

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-  Potential Marsh Zone
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-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

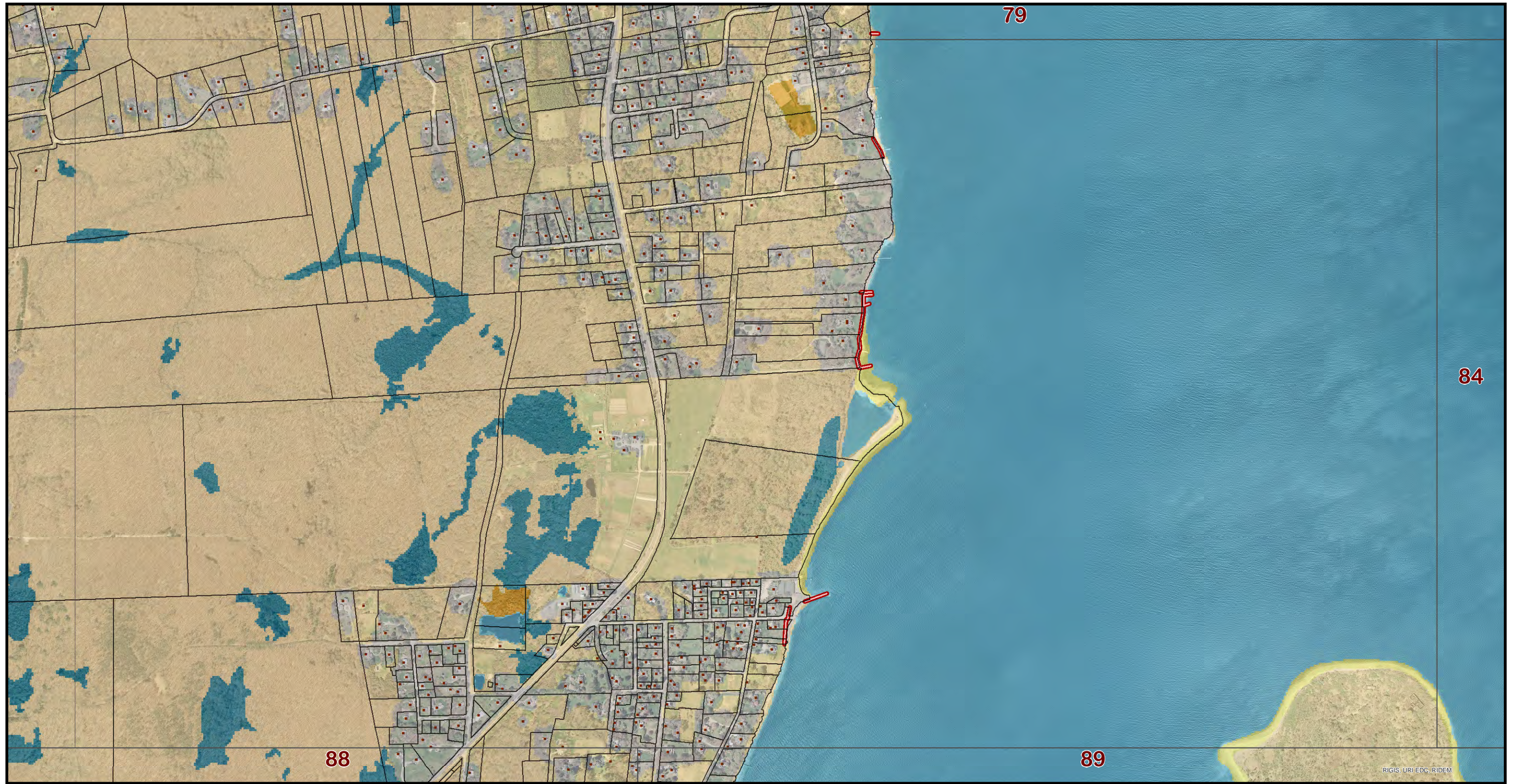
## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model



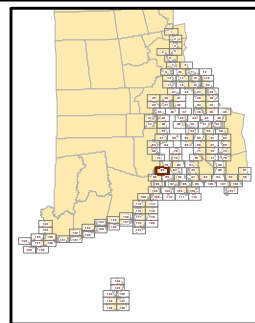
NOAA grant award #:  
NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
83



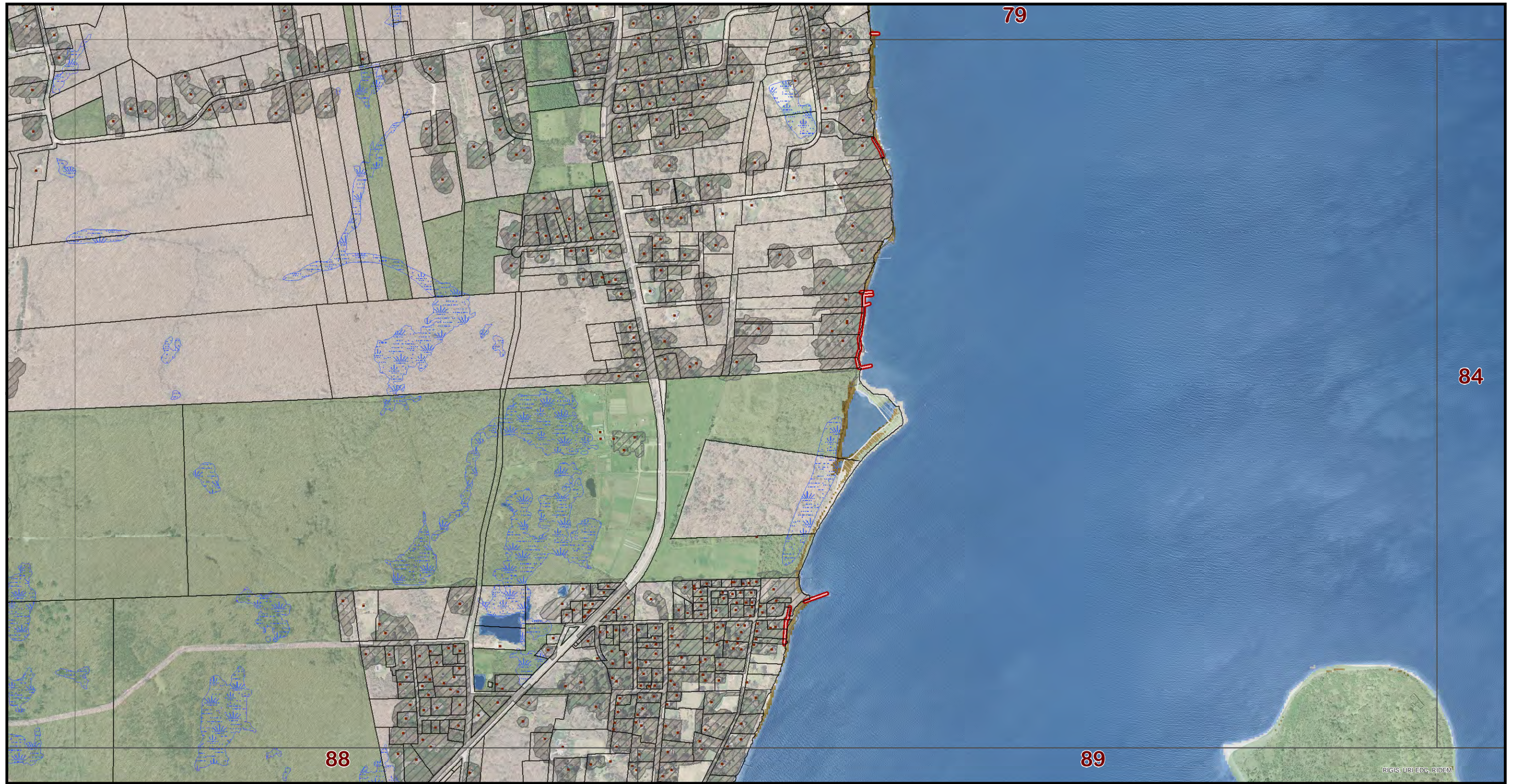
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- |                    |                                |
|--------------------|--------------------------------|
| Developed Upland   | Salt Marsh                     |
| Undeveloped Upland | Brackish Marsh                 |
| Rocky Intertidal   | Scrub/Shrub Transitional Marsh |
| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

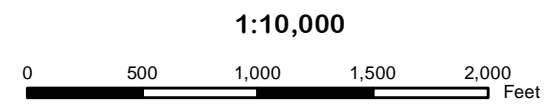
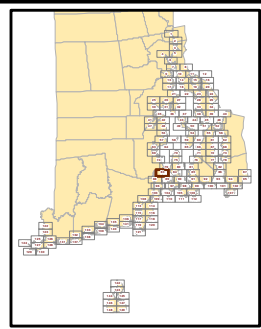
## Tidal Marsh Vulnerability Analysis: Current Condition


















Map 83



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-  Potential Marsh Zone
-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

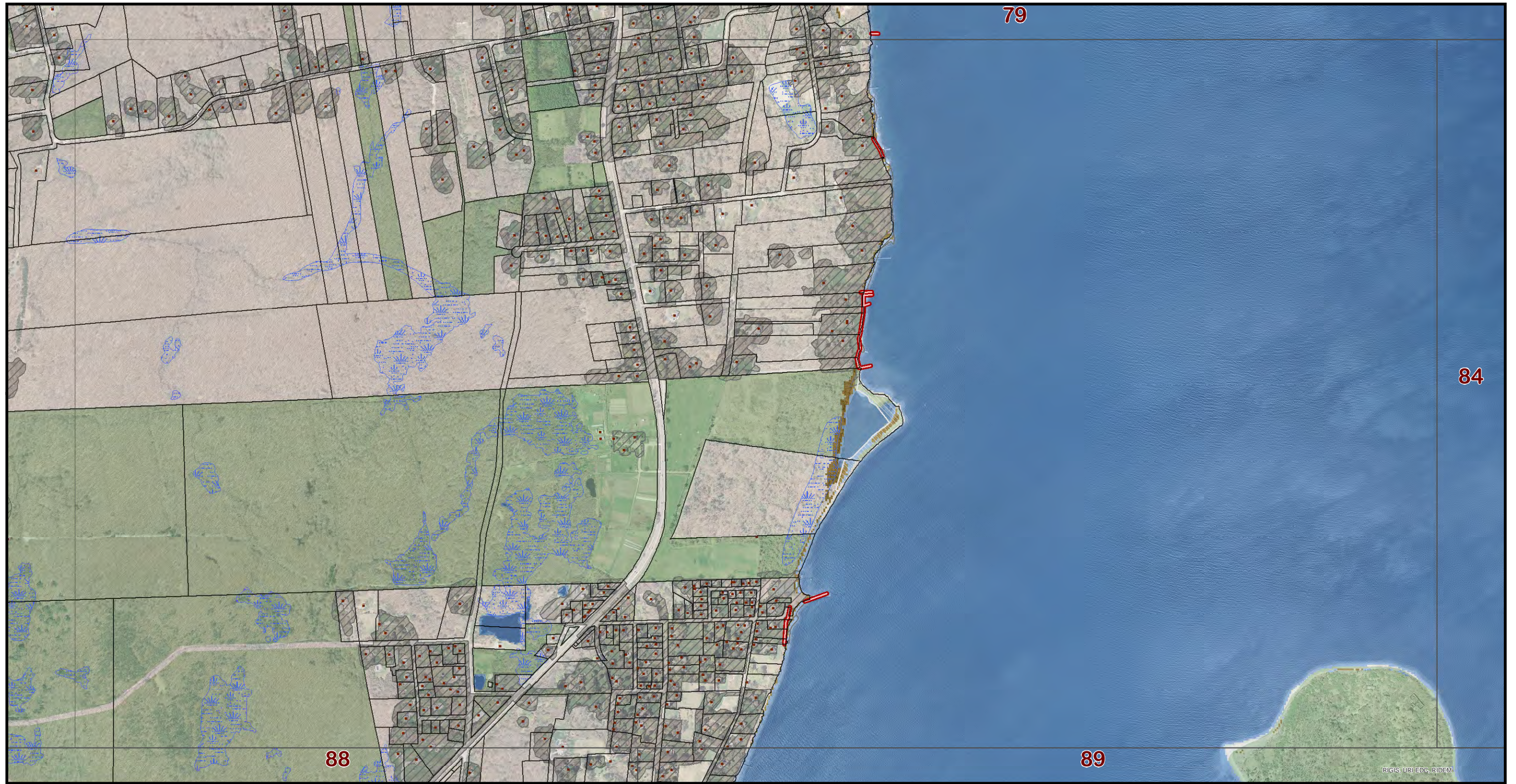
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



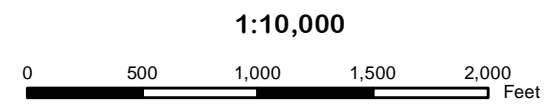
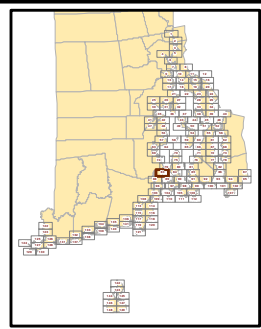
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map 83



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- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

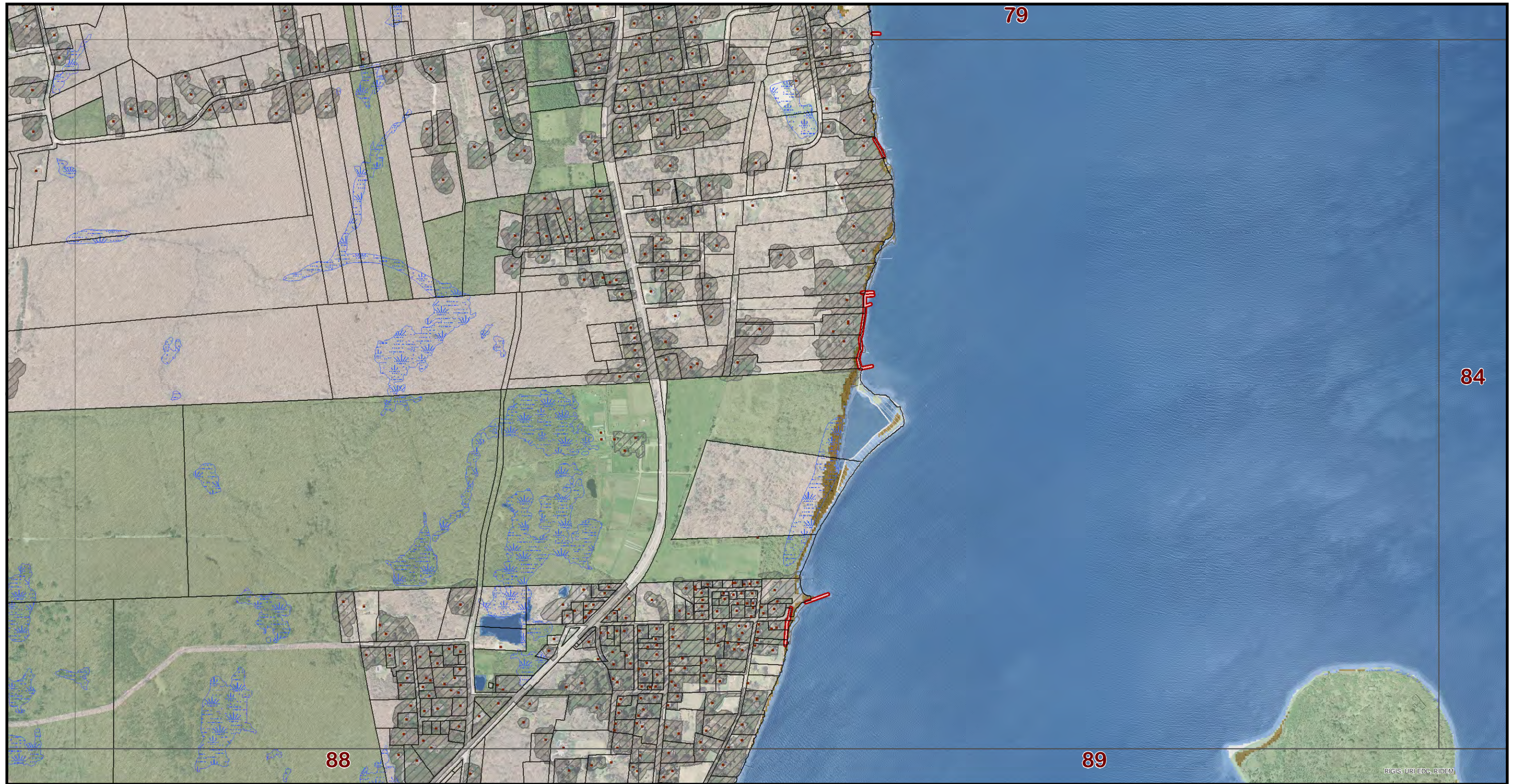
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model



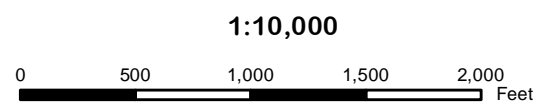
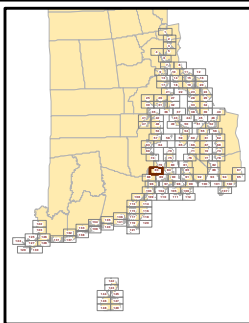
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014





Map  
83



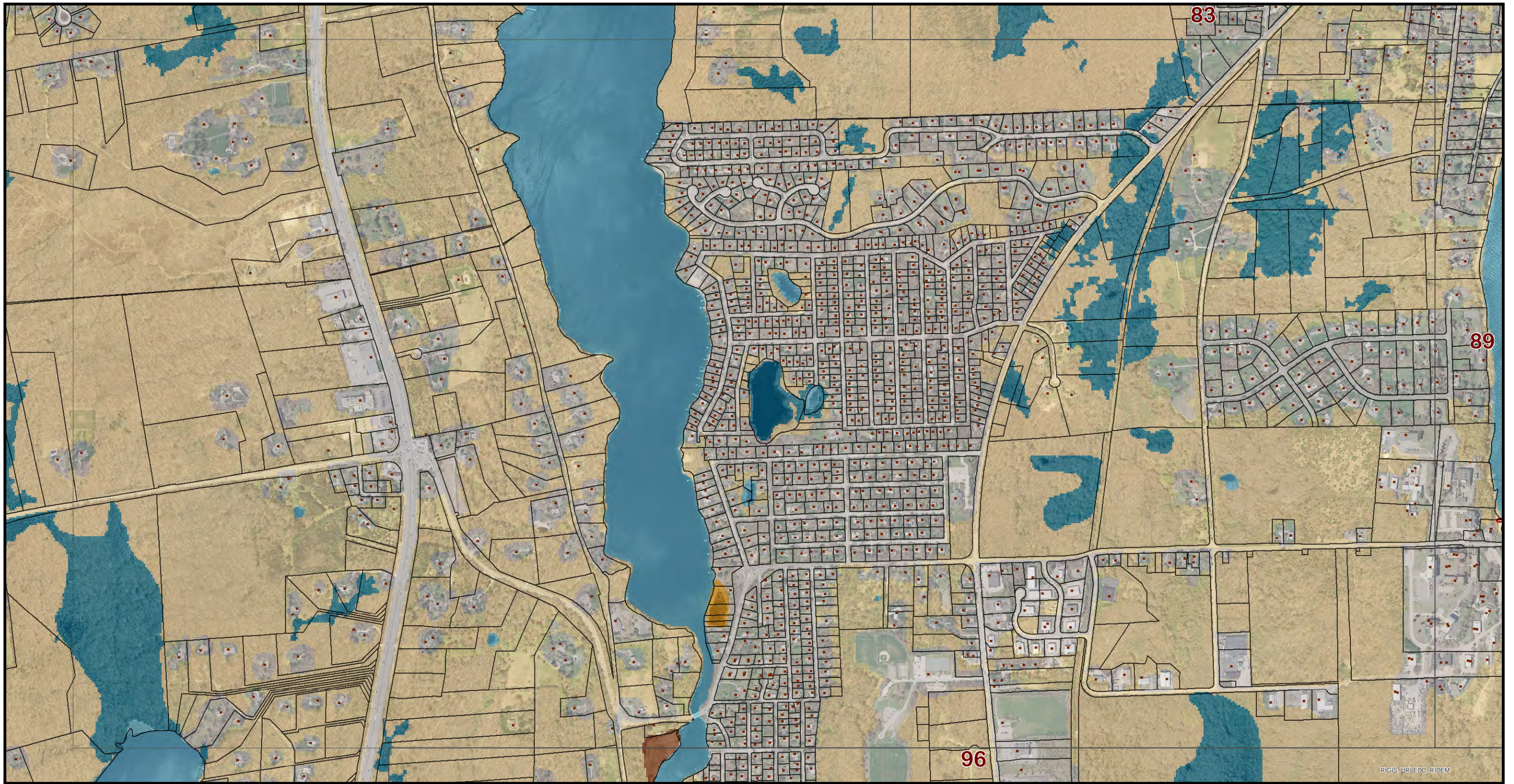
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-  Potential Marsh Zone
-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model

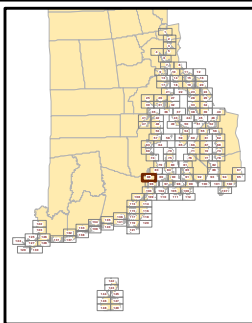




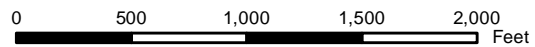


RIGIS, URI EDC, RIDEM

Map  
88



1:10,000



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- |                    |                                |
|--------------------|--------------------------------|
| Developed Upland   | Salt Marsh                     |
| Undeveloped Upland | Brackish Marsh                 |
| Rocky Intertidal   | Scrub/Shrub Transitional Marsh |
| Beach              | Fresh Marsh                    |
| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

## Tidal Marsh Vulnerability Analysis: Current Condition

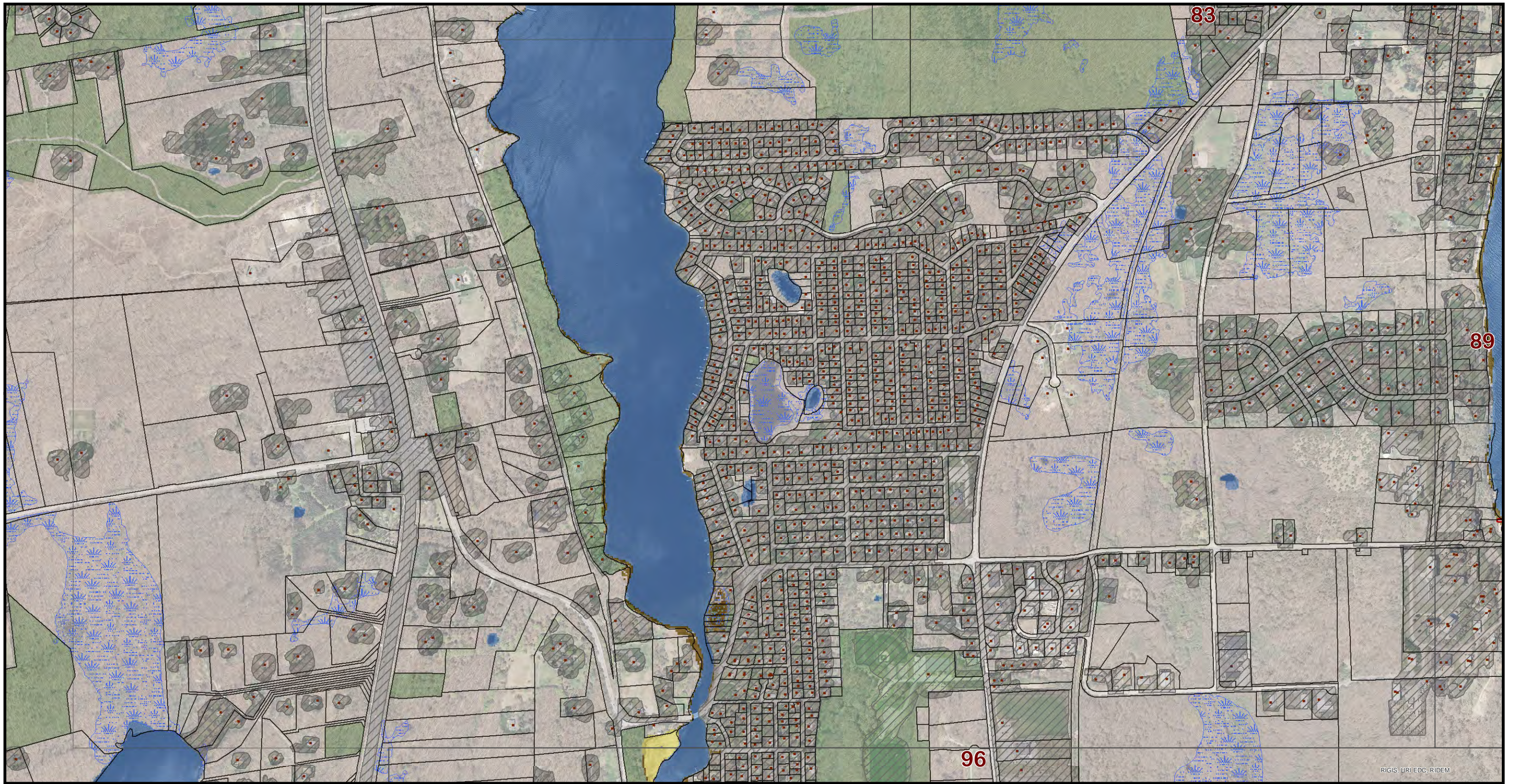


NOAA grant award #: NA12GAR4310108

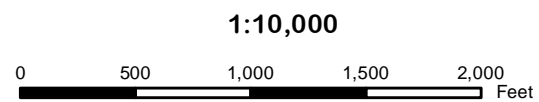
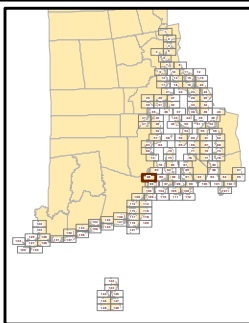


Map produced by Kevin Ruddock. 4/2/2014





Map  
88



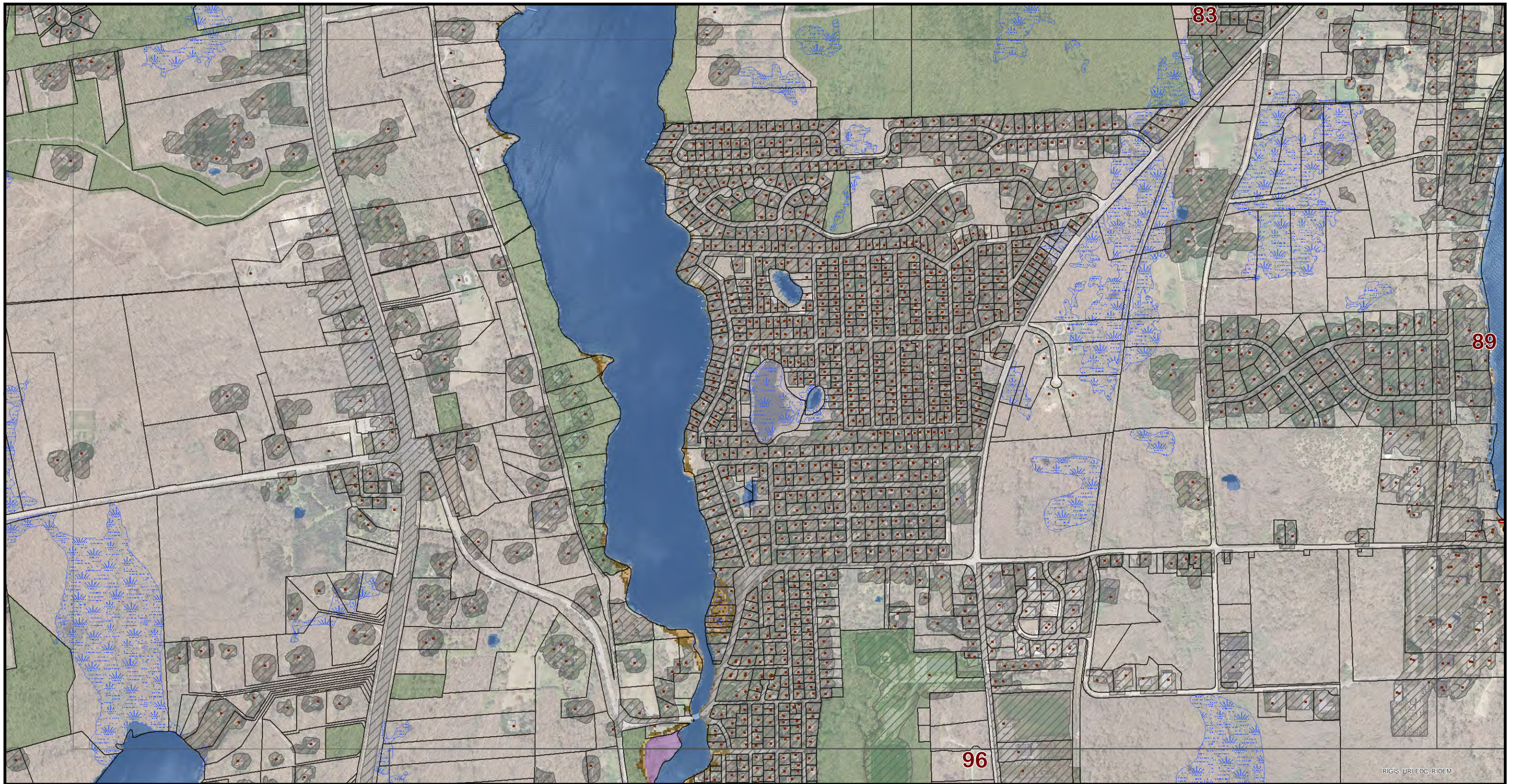
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-  Persistent Marsh Zone
-  Potential Marsh Loss
-  Open Water and Tidal Flat
-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model

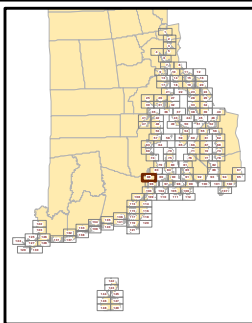






RIGIS, URI EDC, RIDEM



Map  
88





1:10,000

0 500 1,000 1,500 2,000 Feet

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-  Protected Open Space

-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model

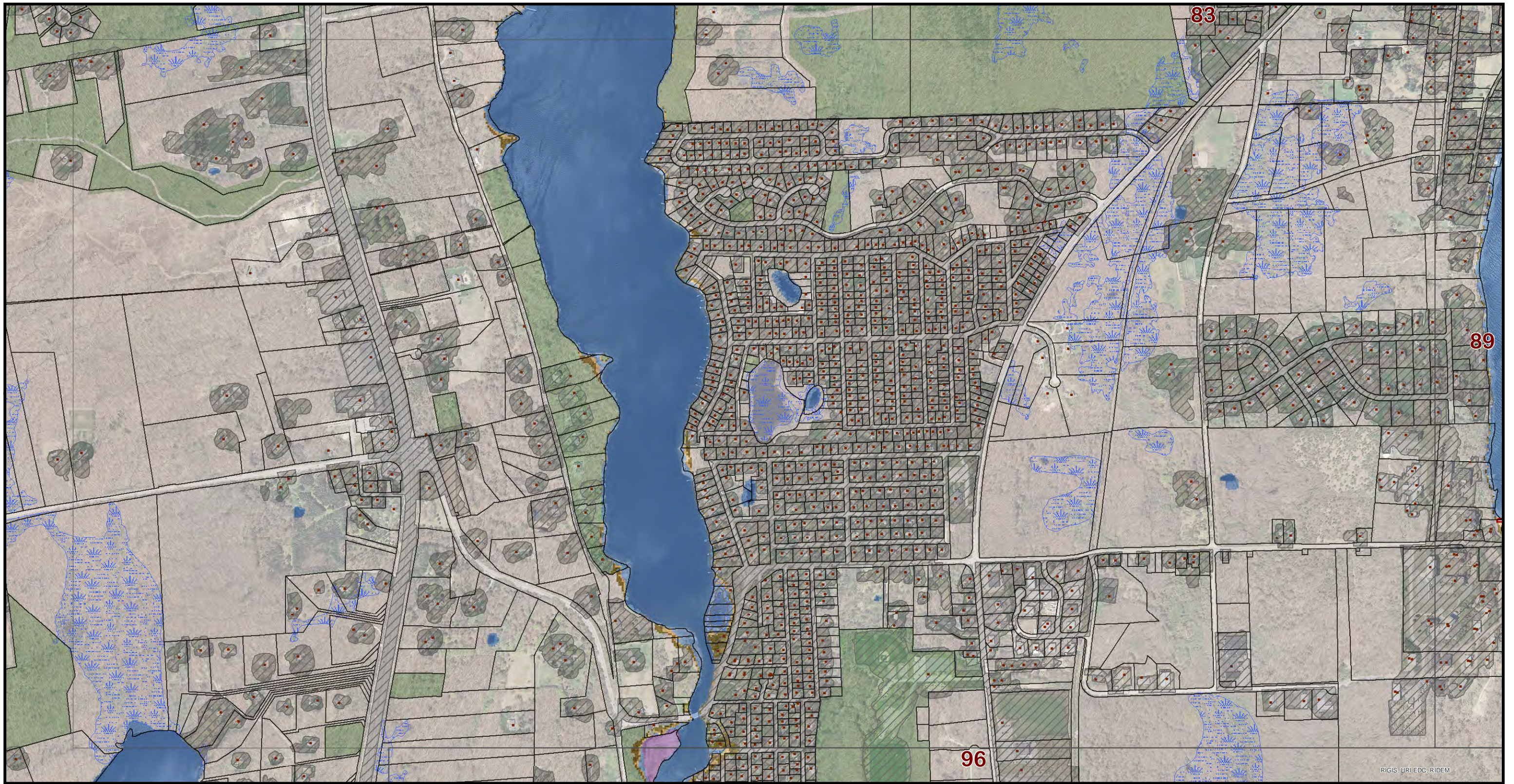


NOAA grant award #:  
NA120AR4310108

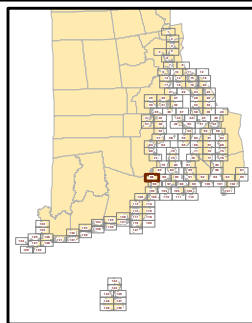


Map produced by Kevin Ruddock. 4/1/2014





Map  
88



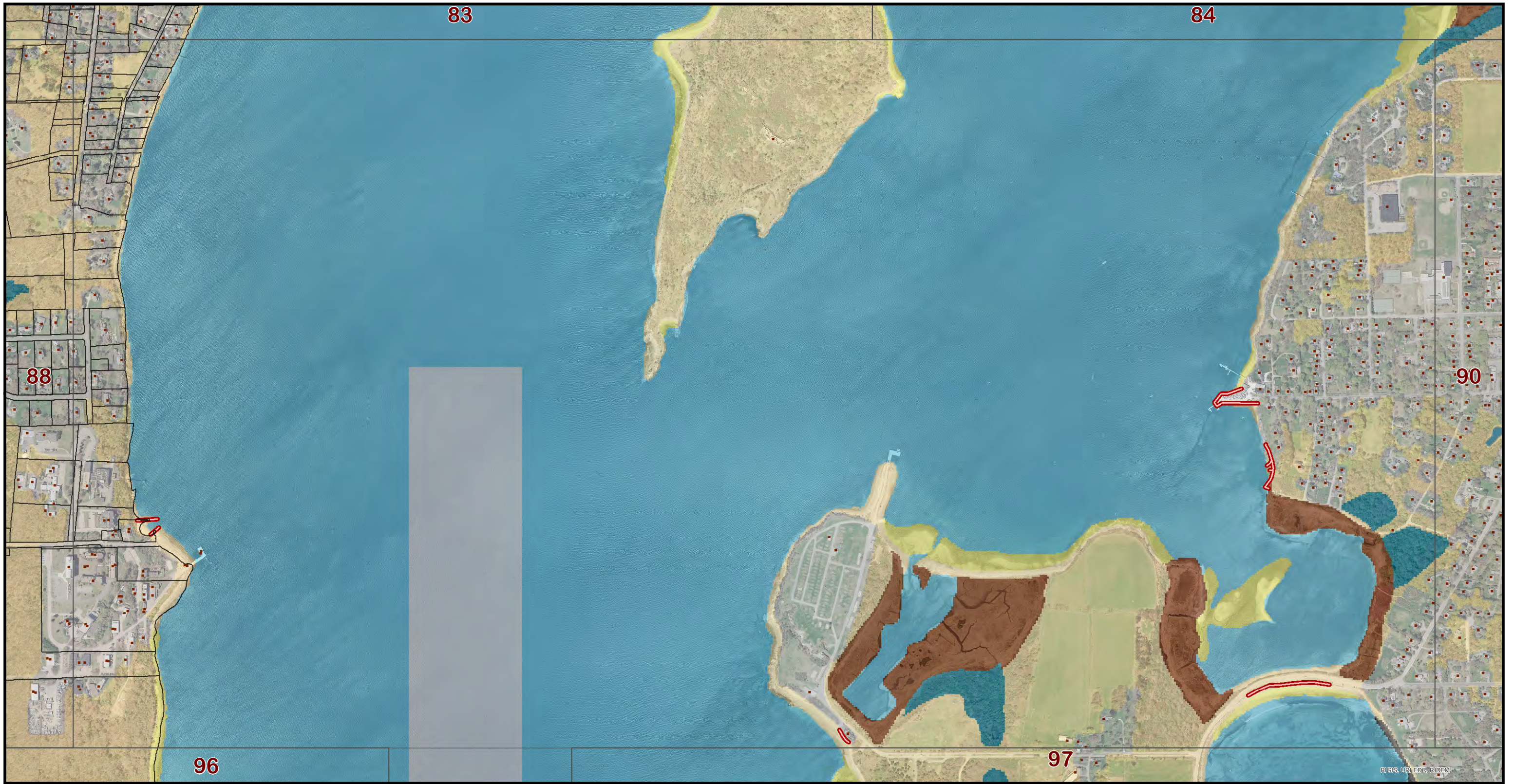
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-  Current Fresh Wetlands
-  Protected Open Space
-  Hardened Shores
-  Buildings
-  Parcel Boundaries
-  Developed Land
-  CRMC Coastal Barriers

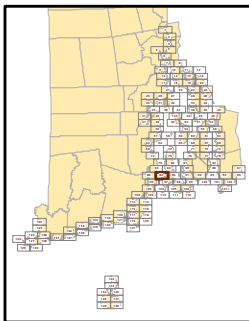
## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model







Map  
89



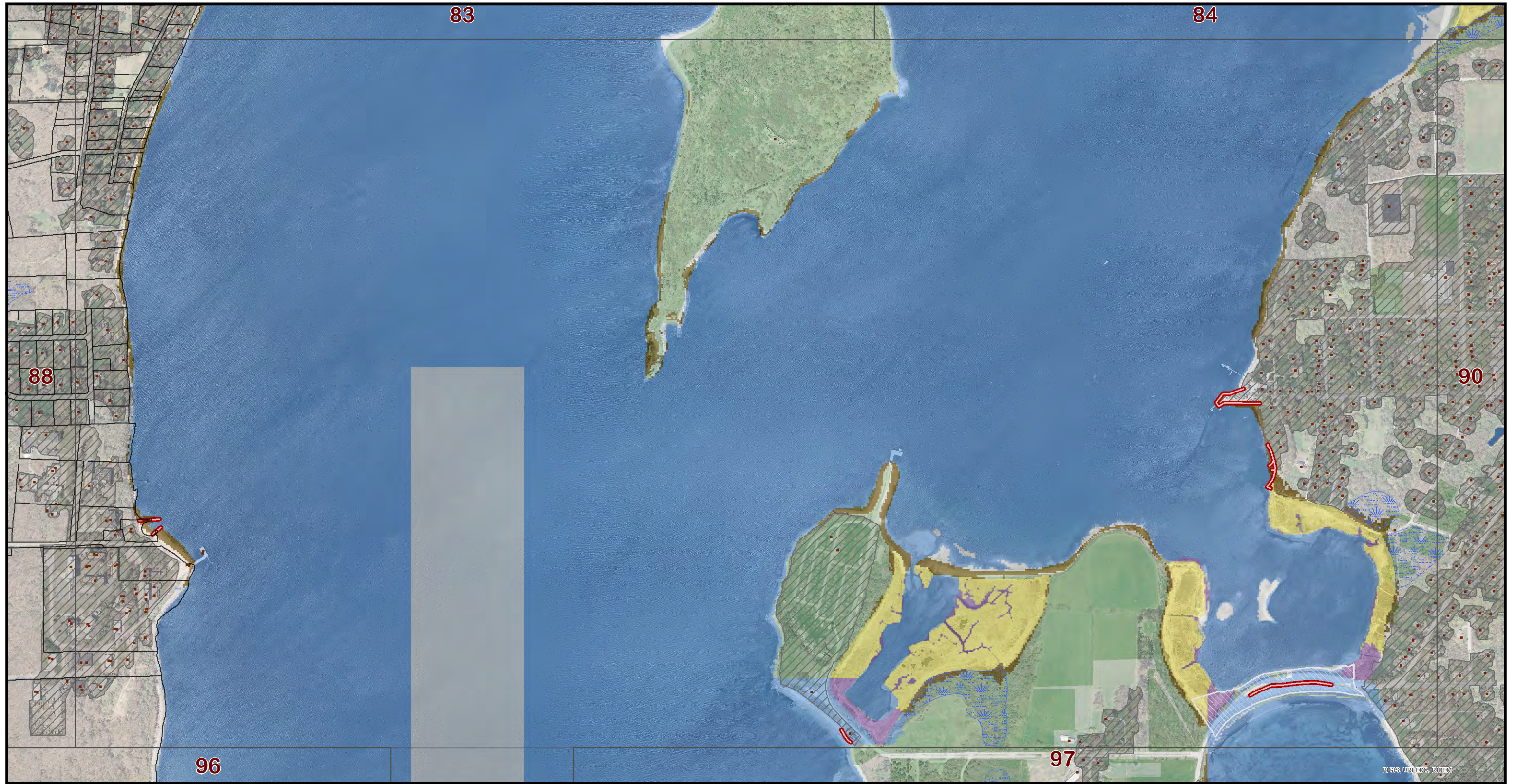
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- |                    |                                |
|--------------------|--------------------------------|
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| Tidal Flat         | Hardened Shores                |
| Open Water         | Buildings                      |
| Swamp              | Parcel Boundaries              |
| Tidal Creek        |                                |

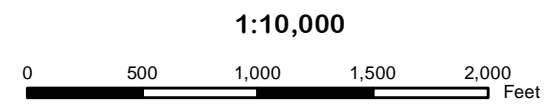
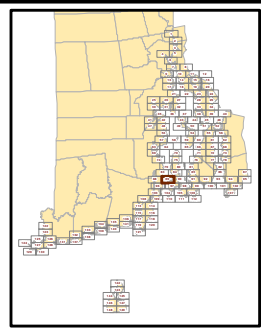
## Tidal Marsh Vulnerability Analysis: Current Condition


















Map  
89



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-  CRMC Coastal Barriers

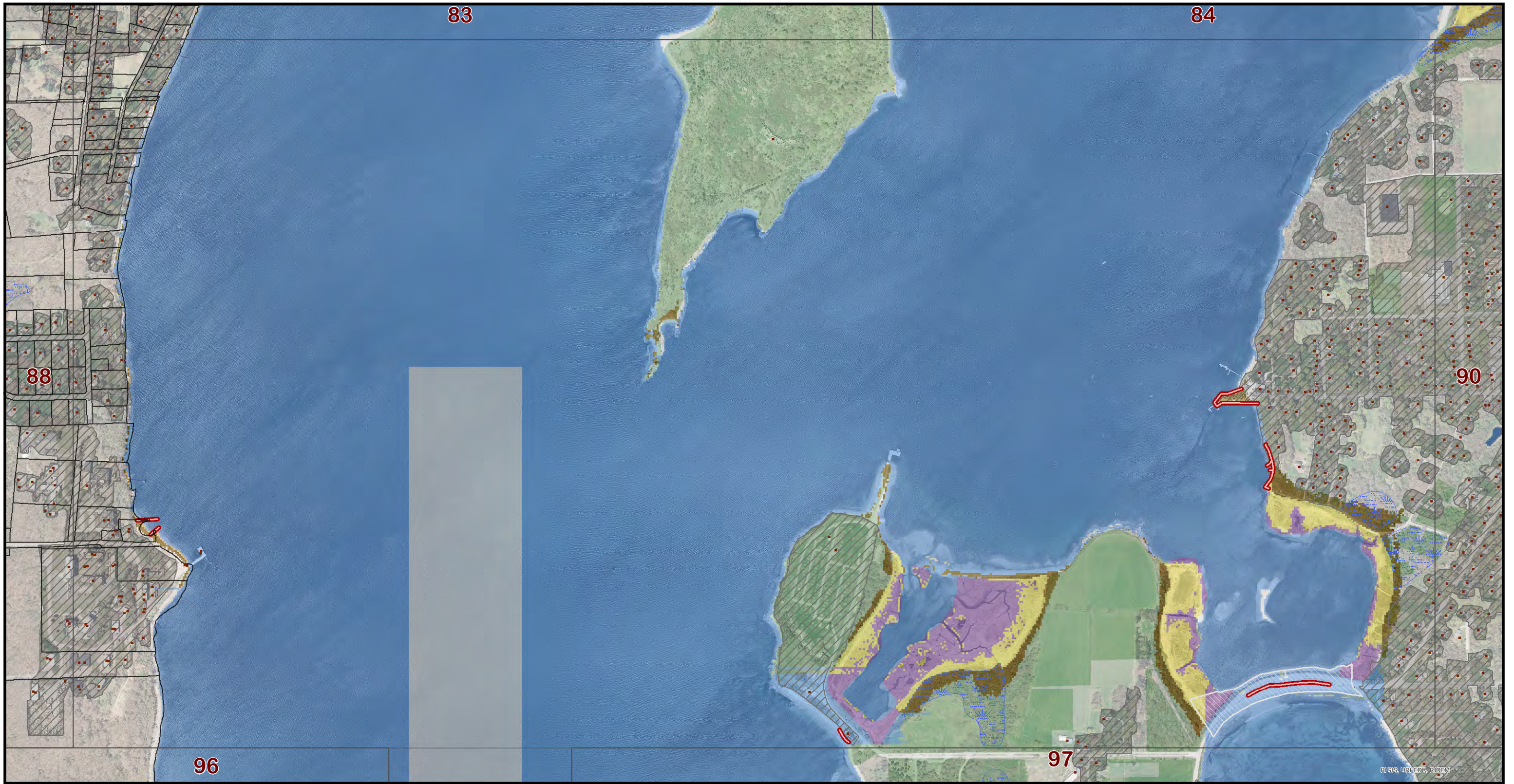
## Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model



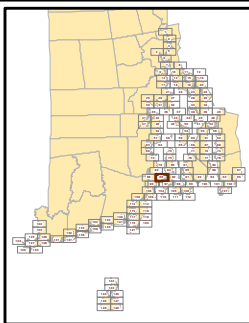
NOAA grant award #: NA120AR4310108

Map produced by Kevin Ruddock. 4/1/2014
















Map  
89



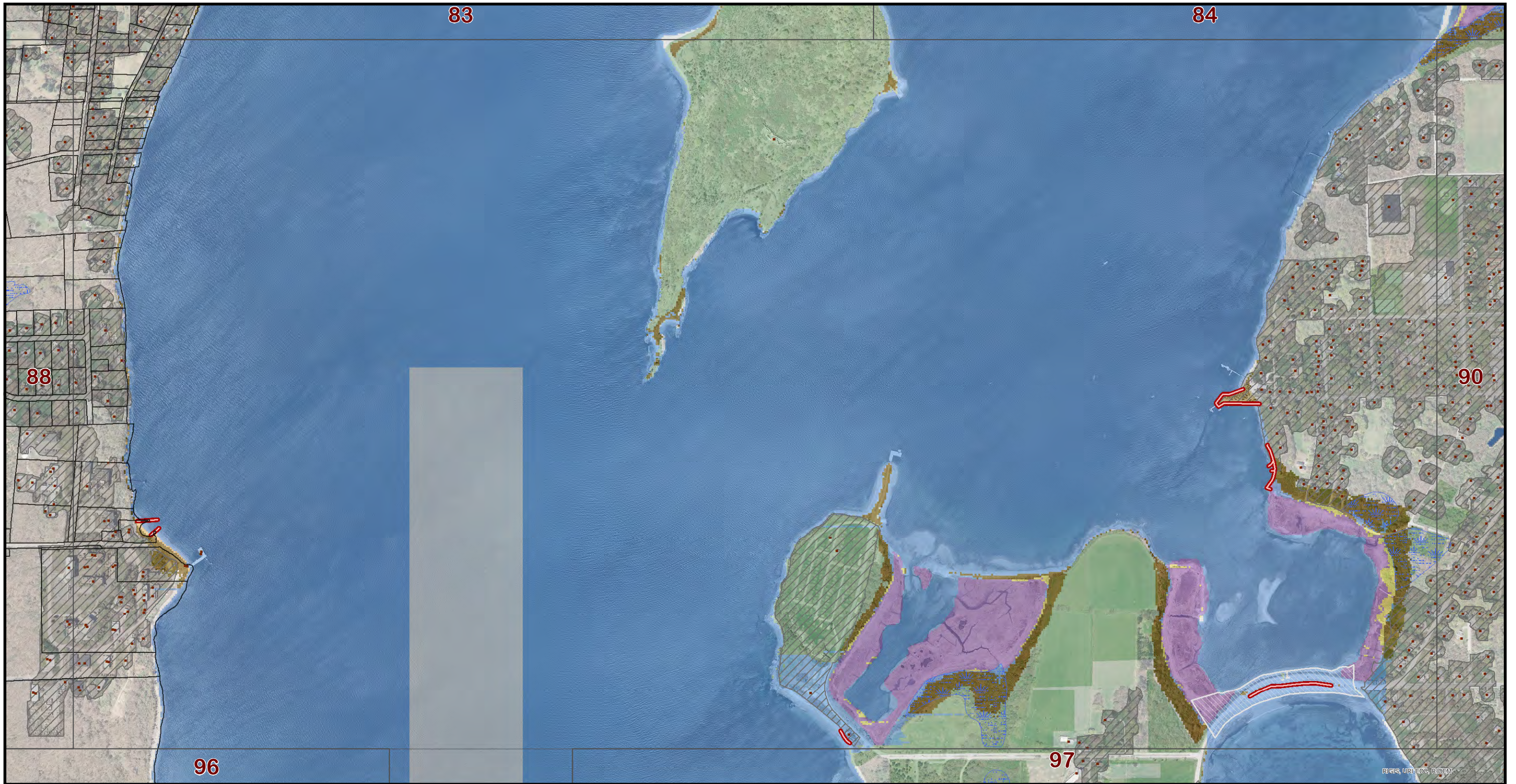
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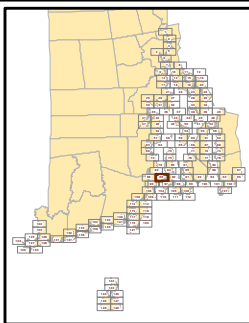
## Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model







Map  
89



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## Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model

