**Beaufort County Stormwater Management Utility Board (SWMU Board)**
***Meeting Minutes***

July 2, 2014 at 2:00 p.m. in Beaufort Industrial Village Building #2 Conference Room

| Board Members | | Ex-Officio Members | |
|---|---|---|---|
| **Present** | **Absent** | **Present** | **Absent** |
| Don Smith | Allyn Schneider | Andy Kinghorn | Van Willis |
| Patrick Mitchell | James Fargher | Kimberly Jones | Scott Liggett |
| William Bruggeman | | | |

| Beaufort County Staff | Visitors |
|---|---|
| Eric Larson | Lamar Taylor, City of Beaufort |
| Eddie Bellamy | Paul Moore, Ward Edwards |
| Danny Polk | Reed Armstrong, Coastal Conservation League |
| Carolyn Wallace | Alan Warren, USCB |

**1. Meeting called to order –** Don Smith
- **A.** Agenda – No quorum to approve the agenda.
- **B.** June 4, 2014 Minutes – No quorum to approve the minutes.

**2. Introductions –** Completed.

**3. Public Comment(s) –** None.

**4. Reports –** (Mr. Larson submitted his written report in advance. Please see attachment.)
- **A. Special Presentation** – Mr. Lamar Taylor with the City of Beaufort provided a presentation on the City's stormwater program (please see attachment), the statue of the Battery Creek project (please see attachment), and the upcoming Boundary Street project (please see attachment).
- **B. Utility Update –** Eric Larson
  *Waters of the United States (U.S.)* – The Environmental Protection Agency and the Army Corps of Engineers are proposing revisions to the definition of "Waters of the U.S.". The county is following it closely because it may greatly impact the definition of the Municipal Separate Storm Sewer System (MS4). Open ditches with standing water due to tidal water could become Waters of the U.S. and impact the utility's maintenance and operations. County plans to comment before the comment period ends in October.
  *Personnel* - The utility is currently advertising positions to implement the MS4 program, implement the 811 Utility Locate program and expand the capabilities of the infrastructure crews.
  *MS4 Update* – In the future Mr. Larson will be splitting out this update and providing a separate report on MS4. The county received the notification letter from South Carolina's Department of Health and Environmental Control on June 4th. The county has 180 days to submit a Notice of Intent to be covered by the statewide general permit for MS4.
- **C. Monitoring Update** – Mr. Eric Larson
  *University of South Carolina, Beaufort Laboratory* – The lab has entered into a Memorandum of Understanding with GEL Engineering to provide E. Coli analysis for the Town of Hilton Head Island. Dr. Warren said they analyzed the first set of samples for the town last week.
- **D. Stormwater Implementation Committee (SWIC) Report –** Eric Larson

*SWIC Meeting* – The committee did not meet last month because of scheduling conflicts.
*City of Hardeeville* – The city has expressed interest in collaborating with the county and potentially partnering with Beaufort County on stormwater matters. They have been invited to the next SWIC meeting.

**E. Stormwater Related Projects** – Eric Larson
*Golden Dock Concrete Slab Expansion* – The application will go before the county planning commission next week. Mr. Larson will be attending and presenting the stormwater review of their site.

**F. Upcoming Professional Contracts Report –** Eric Larson
*US 278 retrofit ponds* –All bids exceeded the project budget. We are currently working on estimates in-house to look at ways to accomplish this project given our limited budget. More information will be provided when available.
*Request For Proposal for a stormwater consultant to assist with the setup of the MS4 Program* - The pre-submittal meeting held on June 25th was well attended and there were a lot of good questions. Statements of Qualifications are due on July 11th.
*Okatie West Basin* – This is the next large retrofit project on the utility's list. The county has begun discussions with property owners to locate a suitable site for a regional stormwater basin. Discussions are being done in conjunction with the Rural and Critical Lands program looking for sites that could potentially serve both agencies.

**G. Regional Coordination -** Eric Larson
*Drainage issue on H.E. McCracken Circle in Bluffton* – The Town of Bluffton and the County are working together to find a solution to the road flooding problem near the school, with preliminary surveying and preliminary design work. They are hoping to find a buildable solution to correct the flooding issues.
*Stormwater Public Education and Outreach* – The SWIC is partnering to develop the scope of services for a potential educator partner to assist with Public Education and Participation as required by the MS4 permit. Hopefully at their next meeting the scope will be finalized and then it will be shared with potential partners.

**H. Financial Report** – Copies of the May financials were provided.

**I. Maintenance Projects Report** – Mr. Bellamy submitted his written report in advance (Please see attachment). He mentioned the cost is a little a high on a few of the projects because there are two new Equipment Operators IIIs in training and it is taking them a little longer to complete the projects.

**5. Unfinished Business**

**6. New Business**

Mr. Smith asked Mr. Larson if he would check on the two board seat vacancies that have been vacant for several months to a year. Mr. Kinghorn said they have been two or three board meetings where there has not been a quorum.

**7. Public Comment(s)**

Mr. Reed Armstrong said the Sea Level Rise committee did a poll ranking of (26) initiatives to address sea level rise and he suggest Mr. Larson share the results. Mr. Larson presented the top ten results and said he would email a copy to the board members (please see attachment).

**8. Next Meeting Agenda –** No quorum to approve.

**9. Meeting Adjourned.**

**BEAUFORT COUNTY STORMWATER UTILITY**
**120 Shanklin Road**
**Beaufort, South Carolina 29906**
**Voice (843) 255-2801 Facsimile (843) 255-9478**

July 2, 2014

**Stormwater Manager's report for the Stormwater Utility Board Meeting**

Utility Update

1. Eric Larson and Danny Polk attended a construction sediment pond class in Charleston. The topics were regulatory requirements, state of the art design, and maintenance practices. I thought it was helpful in not only learning what DHEC expects but also gave us some new concepts to implement on future projects.
2. Larson attended a webinar by US EPA Region 4 on the proposed revised definition of the Waters of the United States. I will be following this closely and making comments because the current interpretation of the proposed rule reads that our tidal ditches which become wet almost every day would be considered jurisdictional waters, requiring USCAE and ORCM permitting for routine maintenance, etc.
3. Larson attended the South Carolina Forest Resources Institute training in Columbia. The sessions had a major focus on green infrastructure, with a tie in to forest preservation as a BMP. It was informative and gave me a new perspective on tree / natural resource protection related to site design. I also gained a better knowledge of the use of trees in engineered BMPs.
4. Danny Polk and S. Stanbery attended the quarterly SCASM meeting. They provided a summary memo on the topics and discussion held. Topics were related to data management, TMDL implementation, and construction SWPPP review.
5. The Stormwater Department currently has 5 positions being advertised. Three are crew positions to fill vacancies, one is related to the new 811 Utility Locate program, and one is related to the new MS4 program.

MS4 Update

1. DHEC and MS4 update – We received the notification letter from DHEC on June 4, 2014. We have 180 days to submit a Notice of Intent (NOI) to be covered by the statewide general permit for MS4. It is my intent to use consulting services to assist in preparing this permit application.
2. We are researching MS4 data management software to aid in record keeping and reporting for the new program. We desire to partner with the SWIC to find a solution that fits the needs of the County as well as the Towns and City. We have demonstrated 3 different products to date with plans to review another next month. We are also considering existing systems being used by the County and Towns / City.

Monitoring Update

1. As part of the MS4 training mentioned above, we learned of new expectations by DHEC regarding MS4 monitoring and TMDL implementation for those streams with impairments. I anticipate significant changes in our monitoring program next year.
2. USCB Lab – Alan Warren reported to me that the ICP training is complete. That completes training on all the new equipment. Lab staff have had recent conversations with DHEC concerning the certification process. Dr. Warren stated the communication with DHEC has been helpful and will make the certification process go more smoothly without issues. The lab has also entered into a MOU with GEL Engineering to provide E. Coli analysis for the Town of Hilton Head Island. GEL does not have the micro capability and GEL's previous contractor could only perform qualitative analysis. Both Dr. Warren and I are excited about the chance to provide services to the Town.

Stormwater Implementation Committee (SWIC) report

1. The SWIC did not meet in June. The next meeting is scheduled for July 9.
2. The City of Hardeeville has expressed interest in joining the SWIC and potentially partnering with Beaufort County on stormwater matters.

Stormwater related Projects

1. Proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road in St. Helena Island – Nothing new to report since last month.
2. US 278 at Kitty's Crossing Overtopping issue – Nothing new to report since last month.
3. Infrastructure crew performed on-going maintenance needs. Nothing significant to report.

Professional Contracts Report

1. US 278 retrofit ponds – Bid were due June 5, 2014. All bids exceeded the project budget. We are currently considering options to complete, partially or in-whole, the project in-house to stay within budget. More information will be provided when available.
2. County Admin. Complex Retrofit Project – We are still in the process of soliciting proposals from interested contractors.
3. Consultant procurement for the Carolina Jellyball application for the Lebeco site is still on hold pending a submittal from the applicant.
4. A RFP for a stormwater consultant to assist with the setup of the MS4 program is currently being advertised. A pre-submittal meeting was held on June 25.
5. Okatie East BMP monitoring – Ongoing. Nothing new to report since last month.
6. Trask Parkway Overtopping study – I have decided to "table" this project at this time. Due to the widening of the road in recent years, it is believed this project has a much lower priority and the problem may have been resolved. Over time we will continue to observe runoff in the area and see if the problem still exists. Funding will be re-allocated to higher priority projects.
7. SC 170 widening and stormwater – Nothing new to report since last month.
8. Okatie West basin – I am beginning the discussions with property owners to locate a suitable site for a regional stormwater basin. Discussions are being done in conjunction with the Rural and Critical Lands program looking for sites that could potentially serve

both agencies. This project could also become part of, or compliment, the SC 170 stormwater project.

Regional Coordination

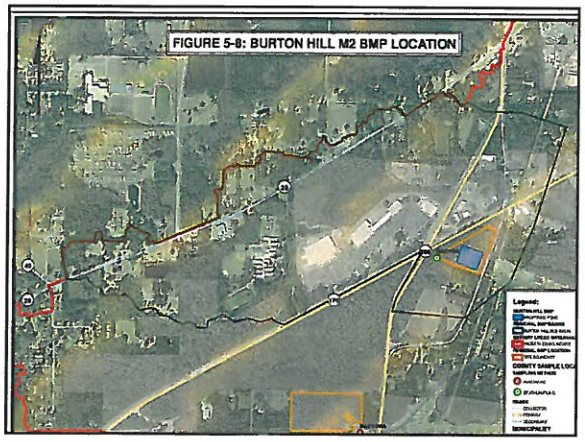
1. Battery Creek Pond funded by an EPA 319 grant – On going. (Lamar Taylor may report)
2. Stoney Creek watershed plan – On going. According to Kim Jones, the initial site visit for a wetland restoration project within the Stoney Creek sub-basin was conducted on Friday, 6/6/14. ToB is currently working with the consultant team to develop a scope of work under the Master Services Agreement.
3. Salinity Study - On going. Nothing new to report.
4. Sea Level Rise and future planning – On going. Nothing new to report.
5. Drainage issue on H.E. McCracken Circle in Bluffton – The Town of Bluffton Stormwater Department and the County Stormwater Department are working together to find a solution to the road flooding problem near the school. ToB is working on providing BC with wetland mapping, soil borings (for groundwater information), survey data, and pipe sizing for the area. In turn, BC will be supplementing the survey with contours of the proposed basin site, utility location and depth, and providing an engineering study to size pipes, the basin, and verify elevations of existing pipes and ditches.
6. Stormwater Public Education and Outreach – The SWIC is developing a scope of services for a potential educator partner to assist the County with Public Education and Participation as required by the MS4 permit. This scope will be finalized and shared with potential partners this summer or fall in order to "re-start" our educational programs. The work will be cost shared with the Towns and City.

# City of Beaufort Public Works Stormwater Activities For 2013 – 2014

July 2, 2014

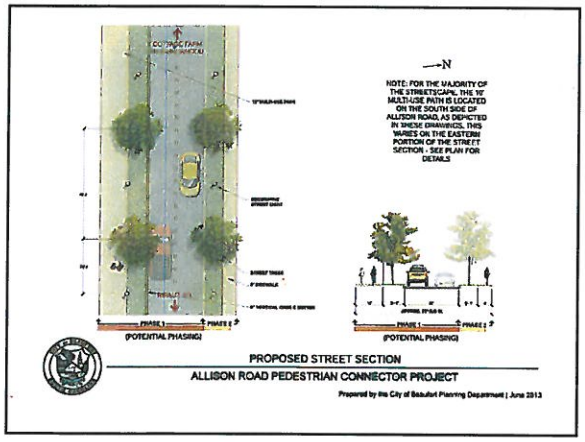
## 2013 Projects / Overview

- Battery Creek/ Burton Hill M2 Regional Water Quality Retrofit – 319 Grant Update
- Low-Impact Development (LID) Completed Project
- Low-Impact Development (LID) Proposed Project
- Localized Flooding Retrofit Improvement
- Stormwater Maintenance
- Stormwater Education
- Boundary Street Reconstruction (LID) Components




Low-Impact Development Project (LID)
Bladen Street Phase II


Duke Street Phase I
LID/ Project Implementation
Prince Street Phase I
LID / Project Implementation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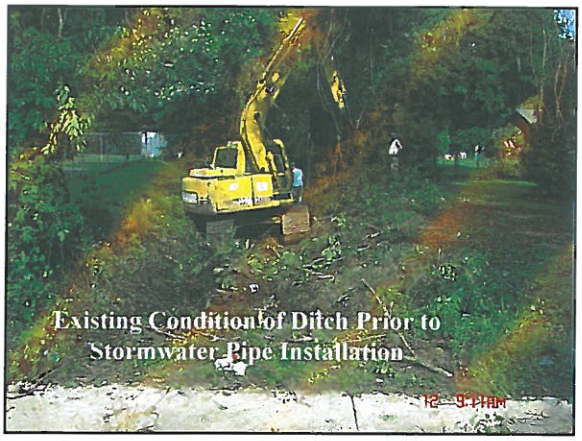
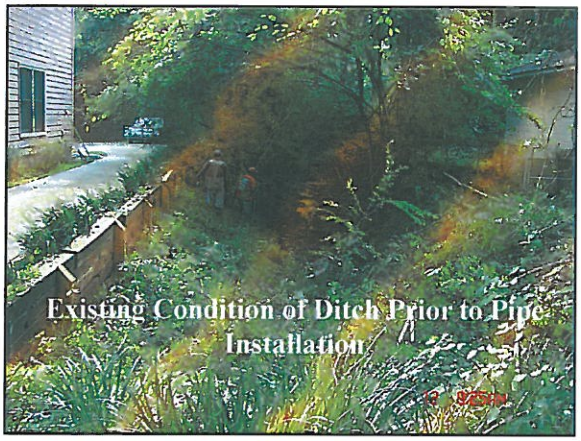
NOTE: FOR THE MAJORITY OF THE STREETSCAPE, THE 10' MULTI-USE PATH IS LOCATED ON THE SOUTH SIDE OF ALLISON ROAD, AS DEPICTED IN THESE DRAWINGS. THIS VARIES ON THE EASTERN PORTION OF THE STREET SECTION - SEE PLAN FOR DETAILS
(POTENTIAL PHASING)
(POTENTIAL PHASING)
PROPOSED STREET SECTION
ALLISON ROAD PEDESTRIAN CONNECTOR PROJECT

**Pigeon Point/Boundary Street**
**Completed Retrofit**

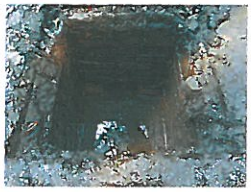


Existing Condition of Ditch Prior to Stormwater Pipe Installation

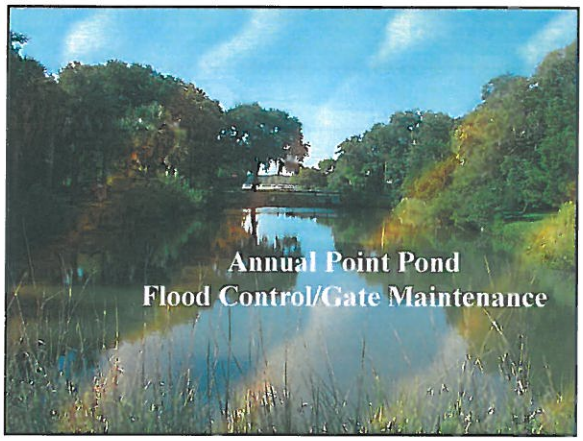

Existing Condition of Ditch Prior to Pipe Installation


Stormwater Maintenance
Existing Ditch Maintenance

## Stormwater Maintenance

In older neighborhoods, cleaning is done 3 to 4 times a year.



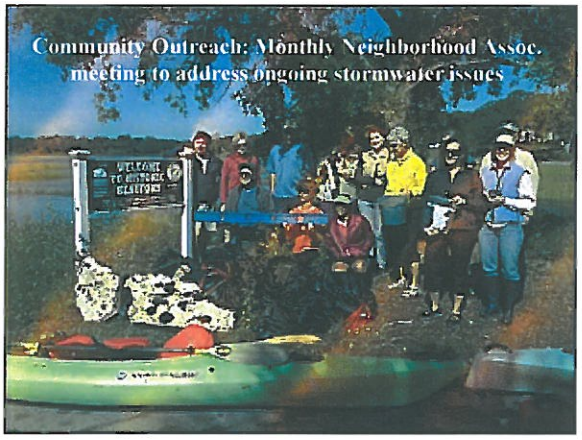


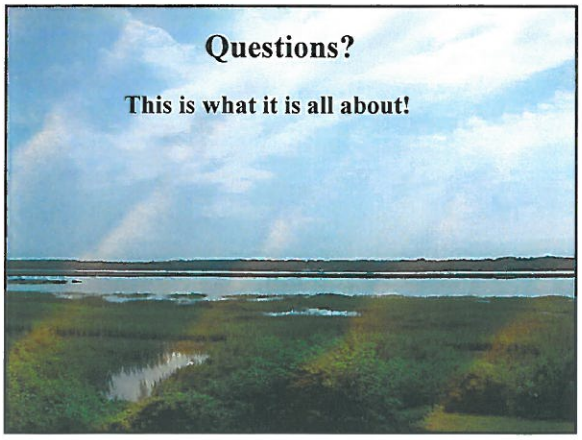

## The Point - Pond

## Sediment & Erosion Control

Conducted 41 S & E Erosion Inspections

Building Codes and Public Works preformed 36 single families and 5 commercial inspections to enforce S & E ordinance and measures.



## SECTION 319

## QUARTERLY PROGRESS REPORT FORM

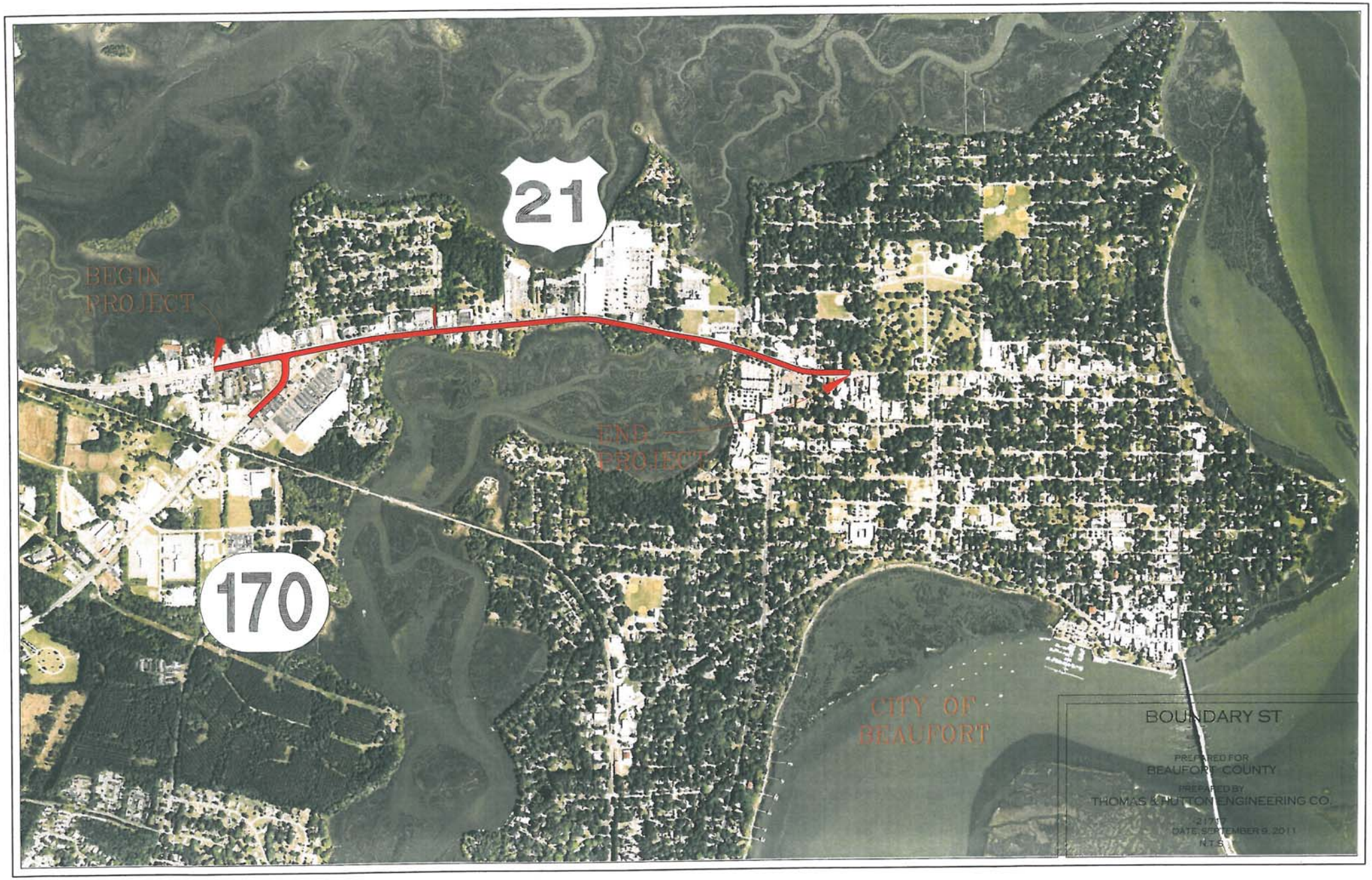
TODAY'S DATE: *06/30/14*

CURRENT REPORTING PERIOD: *4/1/2014 - 6/30/2014*

**Project Title:** **Burton Hill M2 Regional Water Quality Retrofit**
**Lead Agency:** **City of Beaufort**
**Project ID:** **4S FY 2011**
**38**

**PR 3**

| MILESTONE, TIMEFRAME & CURRENT STATUS | | PERCENT COMPLETE |
|---|---|---|
| **Quarterly** | **Submit progress reports, invoices, MBE/WBE forms and BMP information per scheduled outlined in grant agreement.** | **38%** |
| *Current Status:* | ongoing | |
| **30 days after project completion** | **Submit final invoice and final technical closeout report to DHEC. Submit Final Budget Report within 45 days of project close.** | **0%** |
| *Current Status:* | Not initiated | |
| **Months 1 - 2** | **Project Survey and initial wetland determination completed** | **90%** |
| *Current Status:* | Base survey is completed. Locating additional spot elevations and refining contours. | |
| **Months 2 - 6** | **Wetland verification and permitting** | **35%** |
| *Current Status:* | Proposed wetland impacts will be finalized and submitted for approval within the next quarter. | |
| **Months 2 - 3** | **Preliminary Engineering completed** | **100%** |
| *Current Status:* | Completed | |
| **Months 3 - 6** | **Final design completed** | **40%** |
| *Current Status:* | Design options and proposed tree removal are being discussed with the Property Owner to gain approval to proceed further with the design. | |
| **Months 6 - 10** | **Project permitting completed** | **0%** |
| *Current Status:* | Not initiated. Permitting will begin at the completion of Final Design | |
| **Months 10 - 11** | **Construction procurement completed** | **0%** |
| *Current Status:* | Not initiated. | |
| **Months 11 - 14** | **Construction completed** | **0%** |
| *Current Status:* | Beaufort County Stormwater is considering options for educational outreach. | |
| **Quarterly** | **Initial educational/outreach webcasts on water quality BMP maintenance, effective BMP selection, effective BMP design, and other topics that will improve BMP designs, installation, and maintenance within the watershed.** | **0%** |
| *Current Status:* | Beaufort County Stormwater is considering options for educational outreach. | |
| **Bi-month (every other month) after construction for 12 months** | **Conduct workshops and presentations on project results demonstrating success, benefit of public agency collaboration, and public-private cooperation** | **0%** |
| *Current Status:* | Not initiated. | |


21
BEGIN PROJECT
END PROJECT
170
CITY OF BEAUFORT
BOUNDARY ST
PREPARED FOR
BEAUFORT COUNTY
PREPARED BY
THOMAS & HUTTON ENGINEERING CO.
DATE: SEPTEMBER 9, 2011
N.T.S.

# MEMORANDUM

Date: July 2, 2014

To: Stormwater Management Utility Board

From: Eddie Bellamy, Public Works Director

Re: **Maintenance Project Report for July 2014**

1. This report will cover seven major and eight minor or routine projects. The Project Summary Reports are attached.

2. Major Projects:

**A.** **Scott Hill Road Channel #1**, completed in April on St. Helena Island, District 8; we cleaned out 6,350 feet of channel and one catch basin and jetted out one access pipe, four crossline pipes and 530 feet of roadside pipe. Total cost of the project was **$19,989**.

**B.** **River's End Subdivision,** completed in April in the Okatie area of Bluffton Township, District 9; we cleaned out 2,276 feet of roadside ditch and jetted out 23 driveway pipes, two crossline pipes, one access pipe, and 1,310 feet of roadside pipe on six different roads. Total cost of the project was **$25,297.**

**C.** **Alumni Road,** completed in April on Lady's Island, District 7; we cleaned out 1,879 feet of roadside ditch and jetted out two access pipes, two crossline pipes, and seven driveway pipes. Total cost of the project was **$18,067.**

**D.** **Pine Grove Road,** completed in May in the Burton area of Port Royal Island, District 6; we extended the existing roadside pipe by 100 feet, filled in the existing ditch, installed rip rap and seeded for erosion control. Total cost of the project was **$17,006.**

**E.** **Queens Road,** completed in May on St. Helena Island, District 8; we Shinn cut and constructed 400 feet of workshelf and channel and grubbed, cleared, and constructed another 110 feet of workshelf and channel. We also installed one bleeder pipe, rip rap and hydroseeded for erosion control. Total cost of the project was **$31,990.**

**F.** **Coursen-Tate Memorial Park,** completed in May on Lady's Island, District 7; we installed 1,140 feet of channel pipe, three catch basins, rip rap and hydroseeded for erosion control. Total cost of the project was **$57,838.**

**G.** **Varsity Street,** completed n May on Lady's island, District 7; we cleaned out 2,507 feet of roadside ditch and jetted three crossline pipes and 16 driveway pipes. Total cost of the project was **$21,337.**

3. Minor or Routine Projects:

**A.** **Trask Parkway Channel #1,** completed in April in the Lobeco area of Sheldon Township, District 5; we cleaned out 2,975 feet of channel and 584 feet of lateral ditch and installed a bleeder pipe.

**B.** **Old Distant Island Road Channel,** completed in May on Lady's Island, District 7; we Shinn cut and cleaned out 650 feet of channel and removed blockage from the flapgate.

**C.** **Huspah Drive,** completed in May in Sheldon Township, District 5; we installed a driveway pipe.

**D.** **Community Bible Church Channel**, completed in May in the Burton area, District 6; we repaired a damaged channel pipe.

**E.** **Mulrain Road,** completed in May in the Gray's Hill area, District 6; we cleaned out and repaired one catch basin and cleaned out 525 feet of channel.

**F.** **Sanders/St. Helena Post Office Channel,** completed in May in District 8; we installed a catch basin and nine feet of channel pipe.

**G.** **Polite Drive,** completed in June in Burton, District 6; we cleaned out 864 feet of roadside ditch and hydroseeded for erosion control.

**H.** **Okatie East Retrofit (Rework),** completed in June in Bluffton Township, District 9; we removed blockage from the flowline and repaired a washout caused by overtopping of the emergency overflow.

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Scott Hill Road Channel #1

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Apr-14

Project improved 6,880 L.F. of drainage system. Cleaned out 6,350 L.F. of channel and (1) catch basin. Jetted (1) access pipe, (4) crossline pipes and 530 L.F. of roadside pipe.

| 2014-598 / Scott Hill Road Channel #1 | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| APJT / Access pipe - jetted | 10.0 | $216.28 | $110.80 | $52.36 | $0.00 | $143.40 | $522.84 |
| AUDIT / Audit Project | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| CLPJT / Crossline Pipe - Jetted | 20.0 | $432.58 | $288.60 | $110.36 | $0.00 | $286.80 | $1,118.34 |
| HAUL / Hauling | 84.0 | $1,812.21 | $898.80 | $548.96 | $0.00 | $1,217.43 | $4,477.40 |
| ODCO / Outfall ditch - cleaned out | 247.0 | $5,388.67 | $2,099.61 | $651.86 | $0.00 | $3,173.78 | $11,313.91 |
| ONJV / Onsite Job Visit | 26.0 | $839.30 | $101.36 | $90.83 | $0.00 | $592.54 | $1,624.03 |
| WSL / Workshelf - Level | 20.0 | $420.88 | $119.80 | $94.09 | $0.00 | $264.60 | $899.36 |
| **2014-598 / Scott Hill Road Channel #1 Sub Total** | **408.0** | **$9,130.38** | **$3,618.97** | **$1,548.45** | **$0.00** | **$5,691.78** | **$19,989.58** |
| **Grand Total** | **408.0** | **$9,130.38** | **$3,618.97** | **$1,548.45** | **$0.00** | **$5,691.78** | **$19,989.58** |

Before

During

After


# Project: Scott Hill Road Channel #1 Map 1

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-598**

**Township: St. Helena Island**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 150 300 600 900 1,200 Feet

**1 inch = 576 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 4/29/14
File:C:/sethdata/projects/projectmaps/Scott Hill Rd Ch1 2014-598 Map1


**Project: Scott Hill Road Channel #1 Map 2**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-598**

**Township: St. Helena Island**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 20 40 80 120 160 Feet

**1 inch = 87 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 4/29/14
File:C:/sethdata/projects/projectmaps/Scott Hill Rd Ch1 2014-598 Map2


**Project: Scott Hill Road Channel #1 Map 3**

**Activity: Vacuum Truck**

**Project #: 2014-598**

**Township: St. Helena Island**

**Completed: April 2014**

**Legend**

- Catch Basin

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 15 30 60 90 120 Feet

**1 inch = 63 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 4/29/14
File:C:/sethdata/projects/projectmaps/Scott Hill Rd Ch1 2014-598 Map3


**Project: Scott Hill Road Channel #1 Map 4**

**Activity: Vacuum Truck**

**Project #: 2014-598**

**Township: St. Helena Island**

**Completed: April 2014**

**Legend**

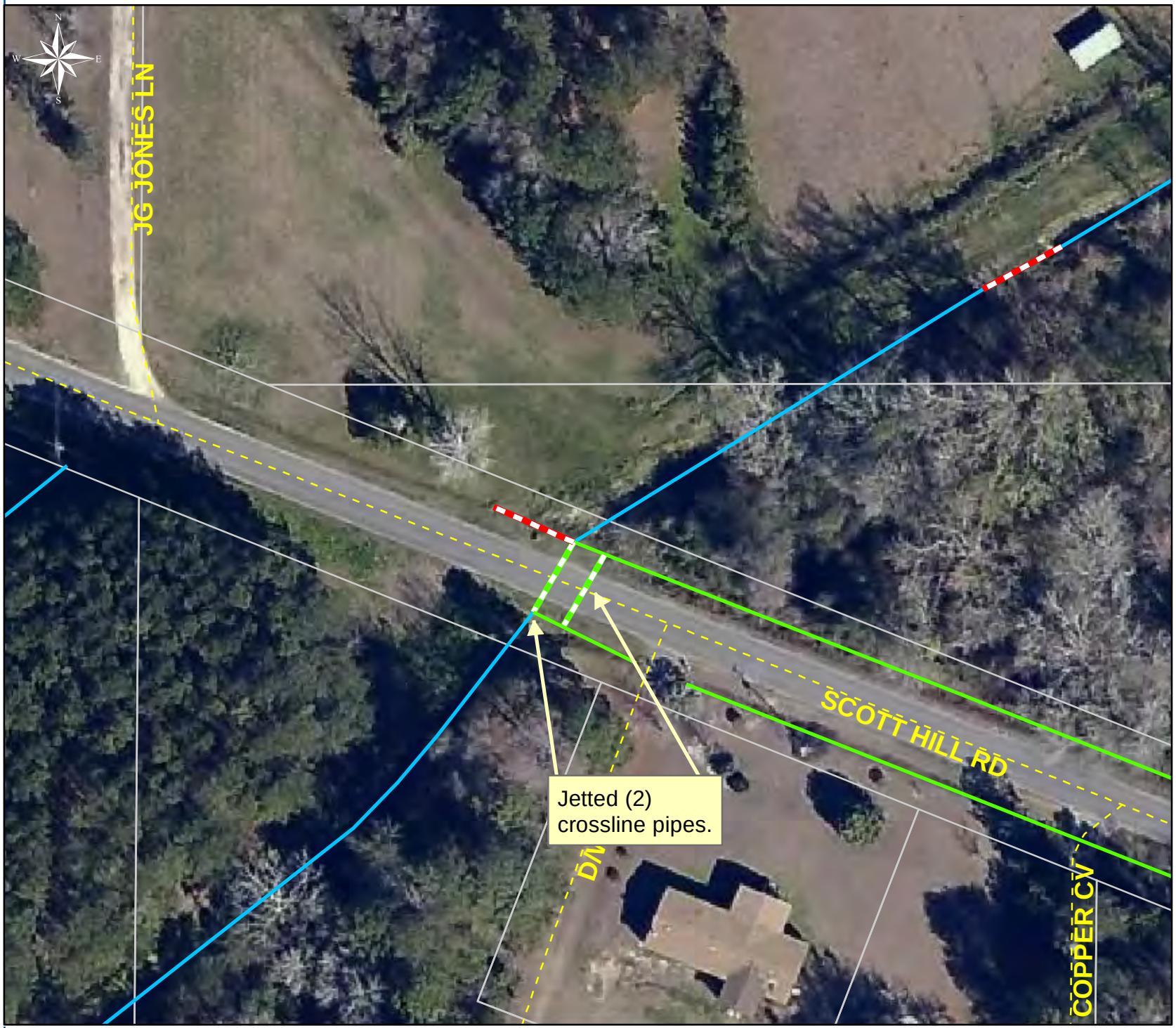
**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 50 100 200 300 400 Feet

**1 inch = 192 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 4/29/14
File:C:/sethdata/projects/projectmaps/Scott Hill Rd Ch1 2014-598 Map4




**Project: Scott Hill Road Channel #1 Map 5**

**Activity: Vacuum Truck**

**Project #: 2014-598**

**Township: St. Helena Island**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 15 30 60 90 120 Feet

**1 inch = 58 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 4/29/14
File:C:/sethdata/projects/projectmaps/Scott Hill Rd Ch1 2014-598 Map5

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Rivers End Subdivision - Rivers End Drive, Parrot Creek Drive, Otter Creek Drive, Edisto Court, Capers Creek Drive and Archers Creek Court

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Apr-14

Project improved 3,577 L.F. of drainage system. Cleaned out 2,267 L.F. of roadside ditch. Jetted (23) driveway pipes, (2) crossline pipes, (1) access pipe and 1,310 L.F. of roadside pipe.

| 2014-601 / Rivers End Subdivision | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| DLO / Ditch Layout | 20.0 | $422.15 | $18.10 | $12.42 | $0.00 | $277.60 | $730.27 |
| DPJT / Driveway Pipe - Jetted | 40.0 | $865.12 | $443.20 | $217.28 | $0.00 | $573.60 | $2,099.20 |
| HAUL / Hauling | 86.0 | $1,889.80 | $920.20 | $457.52 | $0.00 | $1,257.66 | $4,525.18 |
| ONJV / Onsite Job Visit | 27.0 | $845.76 | $97.74 | $74.42 | $0.00 | $567.09 | $1,585.01 |
| PRRECON / Project Reconnaissance | 4.0 | $84.43 | $3.62 | $6.88 | $0.00 | $55.52 | $150.45 |
| RSDCL / Roadside Ditch - Cleanout | 200.0 | $4,183.70 | $510.66 | $179.41 | $0.00 | $2,363.30 | $7,237.07 |
| UTLOC / Utility locates | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| **2014-601 / Rivers End Subdivision Sub Total** | **378.5** | **$8,321.65** | **$1,993.52** | **$947.93** | **$0.00** | **$5,114.61** | **$16,377.71** |
| **Grand Total** | **482.0** | **$11,275.95** | **$2,740.32** | **$2,621.25** | **$1,180.87** | **$7,478.71** | **$25,297.10** |

Before

During

After


**Project: Rivers End Subdivision Map 1**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-601**

**Township: Bluffton**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 30 60 120 180 240 Feet

**1 inch = 121 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 5/20/14
File:C:/sethdata/projects/projectmaps/Rivers End SD 2014-601 Map1


**Project: Rivers End Subdivision Map 2**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-601**

**Township: Bluffton**

**Completed: April 2014**

**Legend**

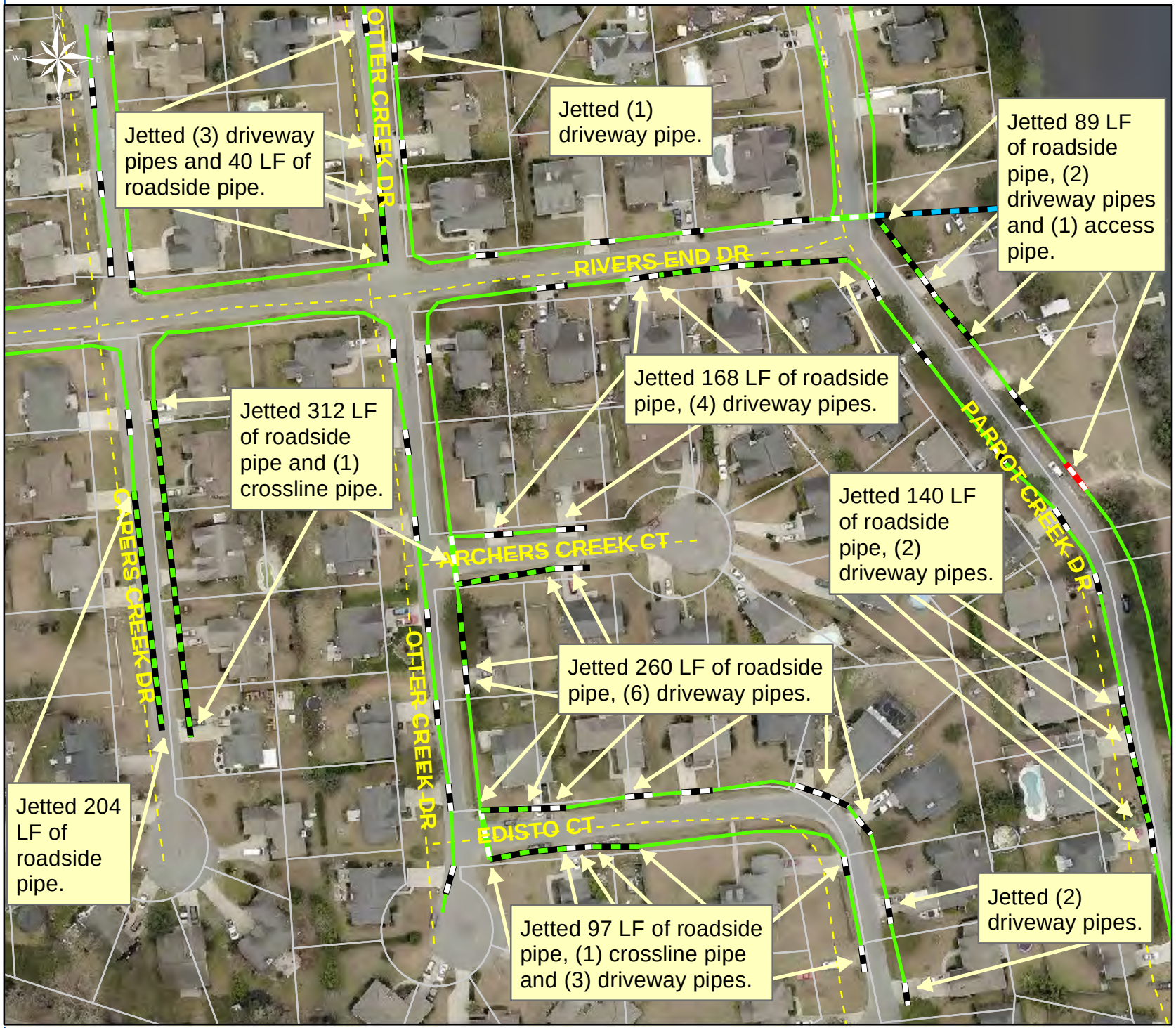
**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 30 60 120 180 240 Feet

**1 inch = 121 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 5/15/14
File:C:/sethdata/projects/projectmaps/Rivers End SD 2014-601 Map2




**Project: Rivers End Subdivision Map 3**

**Activity: Vacuum Truck**

**Project #: 2014-601**

**Township: Bluffton**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 30 60 120 180 240 Feet

**1 inch = 121 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 5/20/14
File:C:/sethdata/projects/projectmaps/Vac/Rivers End SD 2014-601 Map3

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Alumni Road

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Apr-14

Project improved 1,879 L.F. of drainage system. Cleaned out 1,879 L.F. of roadside ditch. Jetted (2) access pipes, (2) crossline pipes and (7) driveway pipes.

| 2014-614 / Alumni Road | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| DPJT / Driveway Pipe - Jetted | 20.0 | $432.56 | $221.60 | $91.90 | $0.00 | $286.80 | $1,032.86 |
| HAUL / Hauling | 74.0 | $1,635.87 | $791.80 | $321.30 | $0.00 | $1,060.26 | $3,809.23 |
| ONJV / Onsite Job Visit | 13.0 | $442.43 | $47.06 | $55.26 | $0.00 | $327.60 | $872.35 |
| RSDCL / Roadside Ditch - Cleanout | 297.0 | $6,188.47 | $1,213.36 | $316.71 | $0.00 | $4,002.33 | $11,720.87 |
| TC / Traffic Control - Jobsite | 15.0 | $331.60 | $18.10 | $10.20 | $0.00 | $220.80 | $580.70 |
| UTLOC / Utility locates | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| **2014-614 / Alumni Road Sub Total** | **420.5** | **$9,061.62** | **$2,291.92** | **$795.37** | **$0.00** | **$5,917.63** | **$18,066.54** |
| **Grand Total** | **420.5** | **$9,061.62** | **$2,291.92** | **$795.37** | **$0.00** | **$5,917.63** | **$18,066.54** |

Before

During


After


**Project: Alumni Road Map 1**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-625**

**Township: Lady's Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 70 140 280 420 560 Feet

**1 inch = 271 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps/Alumni Rd 201-625 Map1


**Project: Alumni Road Map 2**

**Activity: Vacuum Truck**

**Project #: 2014-625**

**Township: Lady's Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 70 140 280 420 560 Feet

**1 inch = 271 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps//Vac/Alumni Rd 201-625 Map2

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Pine Grove Road

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

Project improved 100 L.F. of drainage system. Extended 100 L.F. of existing roadside pipe. Installed rip rap, handseeded and hydroseeded for erosion control.

| **2013-644 / Pine Grove Road** | **Labor Hours** | **Labor Cost** | **Equipment Cost** | **Material Cost** | **Contractor Cost** | **Indirect Labor** | **Total Cost** |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| HAUL / Hauling | 65.0 | $1,439.99 | $695.50 | $1,779.79 | $0.00 | $963.54 | $4,878.82 |
| HYDR / Hydroseeding | 79.0 | $1,650.20 | $315.04 | $190.21 | $0.00 | $1,008.36 | $3,163.81 |
| ONJV / Onsite Job Visit | 29.0 | $886.47 | $104.98 | $5.82 | $0.00 | $556.88 | $1,554.15 |
| PI / Project Inspection | 2.0 | $88.54 | $7.24 | $5.82 | $0.00 | $67.92 | $169.52 |
| PRRECON / Project Reconnaissance | 1.0 | $40.23 | $4.02 | $3.10 | $0.00 | $33.96 | $81.31 |
| RB / Remove blockage from flowline | 30.0 | $639.08 | $198.29 | $0.00 | $0.00 | $291.75 | $1,129.12 |
| RPWO / Repaired Washout | 6.0 | $146.24 | $36.48 | $9.65 | $0.00 | $98.46 | $290.83 |
| RSPI / Roadside Pipe - Installed | 70.0 | $1,469.68 | $525.00 | $2,793.92 | $0.00 | $899.70 | $5,688.29 |
| UTLOC / Utility locates | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| **2013-644 / Pine Grove Road Sub Total** | **283.5** | **$6,391.12** | **$1,886.55** | **$4,788.31** | **$0.00** | **$3,940.42** | **$17,006.39** |
| **Grand Total** | **283.5** | **$6,391.12** | **$1,886.55** | **$4,788.31** | **$0.00** | **$3,940.42** | **$17,006.39** |

Before

During

After


# Project: Pine Grove Road

**Activity: Routine/ Preventive Maintenance**

**Project #: 2013-644**

**Township: Port Royal Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 45 90 180 270 360 Feet

**1 inch = 180 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/4/14
File:C:/sethdata/projects/projectmaps/Pine Grove Rd 2013-644

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Queens Road

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

Project improved 510 L.F. of drainage system. Shinn cut and constructed 400 L.F. of channel and workshelf. Grubbed, cleared and constructed 110 L.F. of workshelf. Installed (1) bleeder pipe, rip rap and hydroseeded for erosion control.

| 2014-001 / Queens Road | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| BPINST / Bleeder pipe - Installed | 24.0 | $530.56 | $429.92 | $161.57 | $0.00 | $353.28 | $1,475.33 |
| EDO / Equipment Drop Off | 35.0 | $783.10 | $209.40 | $26.96 | $0.00 | $401.85 | $1,421.31 |
| HAUL / Hauling | 76.5 | $1,678.20 | $818.55 | $1,316.01 | $0.00 | $1,075.01 | $4,887.77 |
| HYDR / Hydroseeding | 24.0 | $530.56 | $135.84 | $352.51 | $0.00 | $353.28 | $1,372.19 |
| LM / Loading Materials | 48.0 | $1,061.12 | $416.60 | $80.88 | $0.00 | $706.56 | $2,265.16 |
| MEET / Meetings | 2.0 | $88.54 | $7.24 | $9.00 | $0.00 | $67.92 | $172.70 |
| ODCON / Outfall ditch - constructed | 79.0 | $1,701.20 | $592.90 | $143.43 | $0.00 | $1,061.67 | $3,499.20 |
| OFDI / Outfall Ditch - Inspection | 1.0 | $44.27 | $3.62 | $3.00 | $0.00 | $33.96 | $84.85 |
| ONJV / Onsite Job Visit | 48.0 | $1,641.28 | $181.80 | $180.00 | $0.00 | $1,175.60 | $3,178.68 |
| PI / Project Inspection | 6.0 | $265.62 | $21.72 | $24.00 | $0.00 | $203.76 | $515.10 |
| PL / Project Layout | 4.0 | $177.08 | $14.48 | $9.00 | $0.00 | $135.84 | $336.40 |
| PROFS / Professional Services | 0.0 | $0.00 | $0.00 | $0.00 | $625.00 | $0.00 | $625.00 |
| RMTRD / Remove trees - Ditch | 64.0 | $1,369.60 | $643.46 | $149.97 | $0.00 | $706.56 | $2,869.59 |
| RMTRW / Remove trees - Workshelf | 45.8 | $980.37 | $157.18 | $31.48 | $0.00 | $524.52 | $1,693.55 |
| STAGING / Staging Materials | 10.0 | $236.12 | $83.76 | $53.92 | $0.00 | $160.74 | $534.54 |
| STBY / Stand By | 5.0 | $108.15 | $53.50 | $23.59 | $0.00 | $72.10 | $257.34 |
| WSCON / Workshelf - Constructed | 53.0 | $1,163.14 | $429.64 | $81.66 | $0.00 | $589.71 | $2,264.15 |
| WSL / Workshelf - Level | 24.0 | $530.56 | $267.52 | $58.98 | $0.00 | $353.28 | $1,210.34 |
| WSSHN / Workshelf - Shinn cut | 66.0 | $1,444.38 | $679.35 | $454.05 | $0.00 | $715.32 | $3,293.10 |
| **2014-001 / Queens Road Sub Total** | **616.3** | **$14,354.31** | **$5,146.48** | **$3,160.00** | **$625.00** | **$8,704.18** | **$31,989.97** |
| **Grand Total** | **616.3** | **$14,354.31** | **$5,146.48** | **$3,160.00** | **$625.00** | **$8,704.18** | **$31,989.97** |

Before

During

After


**Project: Queens Road**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-001**

**Township: St. Helena Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 15 30 60 90 120 Feet

**1 inch = 71 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/17/14
File:C:/sethdata/projects/projectmaps/Queens Rd 2014-001

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Coursen-Tate Memorial Park

**Activity:** Drainage Improvement

**Narrative Description of Project:**

**Completion:** May-14

Project improved 1,140 L.F. of drainage system. Installed (3) catch basins, 1,140 L.F. of channel pipe, rip rap and hydroseeded for erosion control.

| 2014-003 / Coursen Tate Memorial Park | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 1.0 | $20.46 | $0.00 | $0.00 | $0.00 | $13.23 | $33.69 |
| BKFILL / Back Fill | 25.0 | $540.75 | $262.60 | $143.50 | $0.00 | $360.50 | $1,307.35 |
| HAUL / Hauling | 230.3 | $5,154.12 | $2,415.46 | $3,951.59 | $0.00 | $3,339.56 | $14,860.72 |
| HYDR / Hydroseeding | 24.0 | $548.94 | $80.76 | $561.57 | $0.00 | $363.78 | $1,555.05 |
| OFPI / Outfall Pipe - Installation | 312.0 | $6,898.59 | $1,623.12 | $12,775.13 | $0.00 | $4,531.01 | $25,827.86 |
| ONJV / Onsite Job Visit | 42.0 | $1,444.21 | $152.84 | $86.40 | $0.00 | $976.39 | $2,659.84 |
| PI / Project Inspection | 17.8 | $367.37 | $10.86 | $12.00 | $0.00 | $249.01 | $639.23 |
| PP / Project Preparation | 40.0 | $923.76 | $220.32 | $39.97 | $0.00 | $592.56 | $1,776.61 |
| RMTRW / Remove trees - Workshelf | 12.0 | $298.20 | $57.28 | $29.22 | $0.00 | $194.52 | $579.22 |
| RPWO / Repaired Washout | 10.0 | $216.30 | $58.20 | $37.07 | $0.00 | $144.20 | $455.77 |
| RRI / Rip Rap - Installed | 79.5 | $1,734.67 | $316.00 | $60.77 | $0.00 | $988.49 | $3,099.92 |
| SC / Sediment Control | 50.0 | $1,058.10 | $36.20 | $28.46 | $0.00 | $696.00 | $1,818.76 |
| SODW / Sod - Watered | 2.0 | $47.96 | $44.32 | $20.72 | $0.00 | $32.94 | $145.94 |
| STAGING / Staging Materials | 21.0 | $449.63 | $43.72 | $29.61 | $0.00 | $235.22 | $758.18 |
| WSDR / Workshelf - Dressed | 43.5 | $995.37 | $123.92 | $73.94 | $0.00 | $635.30 | $1,828.53 |
| WSL / Workshelf - Level | 10.0 | $216.30 | $80.20 | $50.55 | $0.00 | $144.20 | $491.25 |
| **2014-003 / Coursen Tate Memorial Park Sub Total** | **920.0** | **$20,914.73** | **$5,525.80** | **$17,900.50** | **$0.00** | **$13,496.89** | **$57,837.92** |
| **Grand Total** | **920.0** | **$20,914.73** | **$5,525.80** | **$17,900.50** | **$0.00** | **$13,496.89** | **$57,837.92** |

Before

During

After


**Project: Coursen & Tate Memorial Park**

**Activity: Drainage Improvement**

**Project #: 2014-003**

**Township: Lady's Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 55 110 220 330 440 Feet

**1 inch = 208 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/19/14
File:C:/sethdata/projects/projectmaps/Coursen&Tate Park 2014-003

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Varsity Street

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

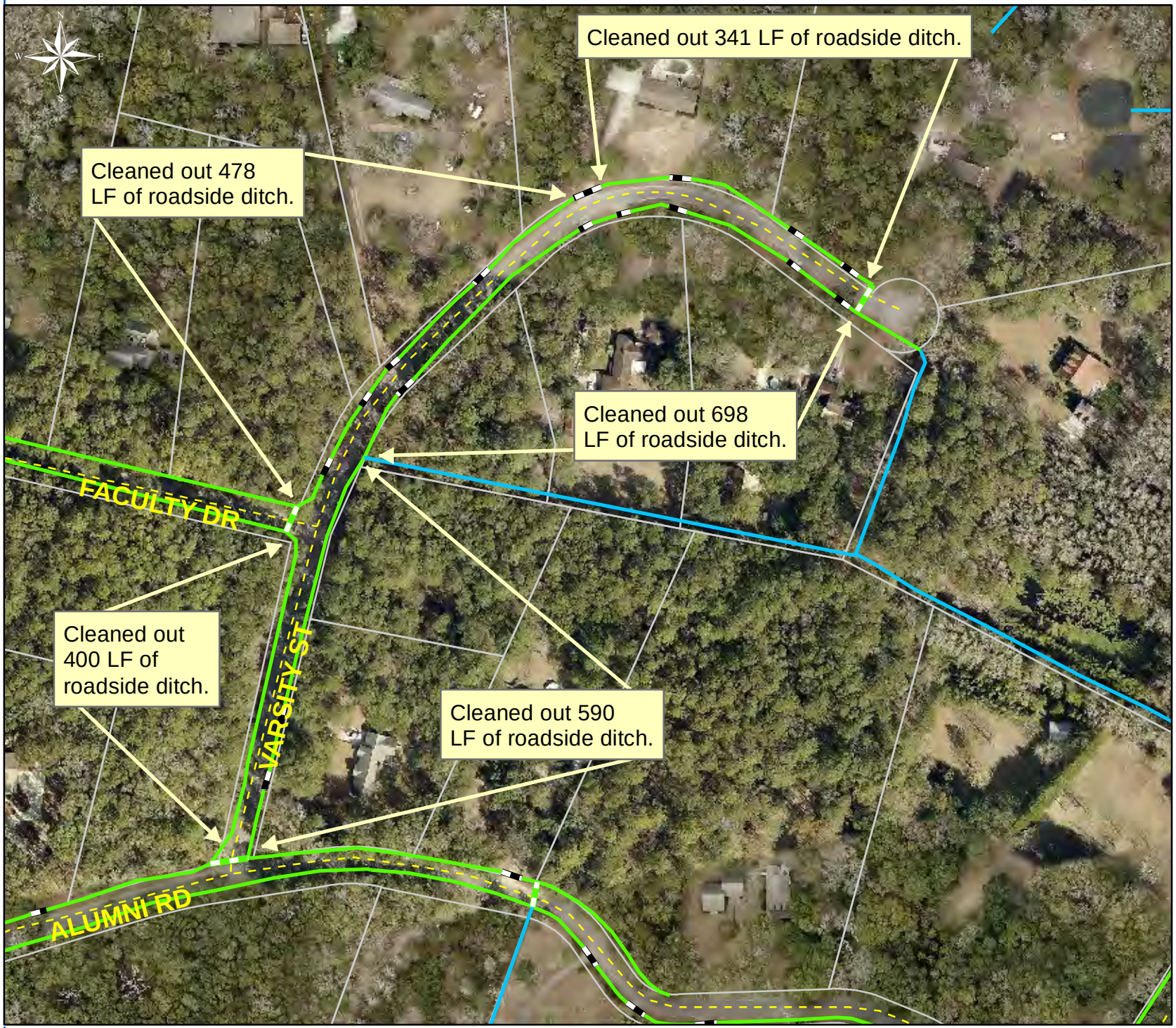
Project improved 2,507 L.F. of drainage system. Cleaned out 2,507 L.F. of roadside ditch. Jetted (3) crossline pipes and pipes and (16) driveway pipes.

| **2014-621 / Varsity Street** | **Labor Hours** | **Labor Cost** | **Equipment Cost** | **Material Cost** | **Contractor Cost** | **Indirect Labor** | **Total Cost** |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| DPJT / Driveway Pipe - Jetted | 44.0 | $951.63 | $487.52 | $252.76 | $0.00 | $630.96 | $2,322.87 |
| HAUL / Hauling | 68.5 | $1,481.66 | $732.95 | $360.59 | $0.00 | $959.04 | $3,534.24 |
| ONJV / Onsite Job Visit | 38.0 | $1,260.71 | $137.56 | $90.00 | $0.00 | $895.93 | $2,384.20 |
| RSDCL / Roadside Ditch - Cleanout | 336.0 | $7,058.42 | $976.00 | $338.53 | $0.00 | $4,705.92 | $13,078.87 |
| **2014-621 / Varsity Street Sub Total** | **487.0** | **$10,762.65** | **$2,334.03** | **$1,041.88** | **$0.00** | **$7,198.46** | **$21,337.02** |
| **Grand Total** | **487.0** | **$10,762.65** | **$2,334.03** | **$1,041.88** | **$0.00** | **$7,198.46** | **$21,337.02** |

Before


During

After




# Project: Varsity Street Channel #1 Map 1

## Activity: Routine/ Preventive Maintenance

## Project #: 2014-621

## Township: Lady's Island

## Completed: May 2014

**Legend**

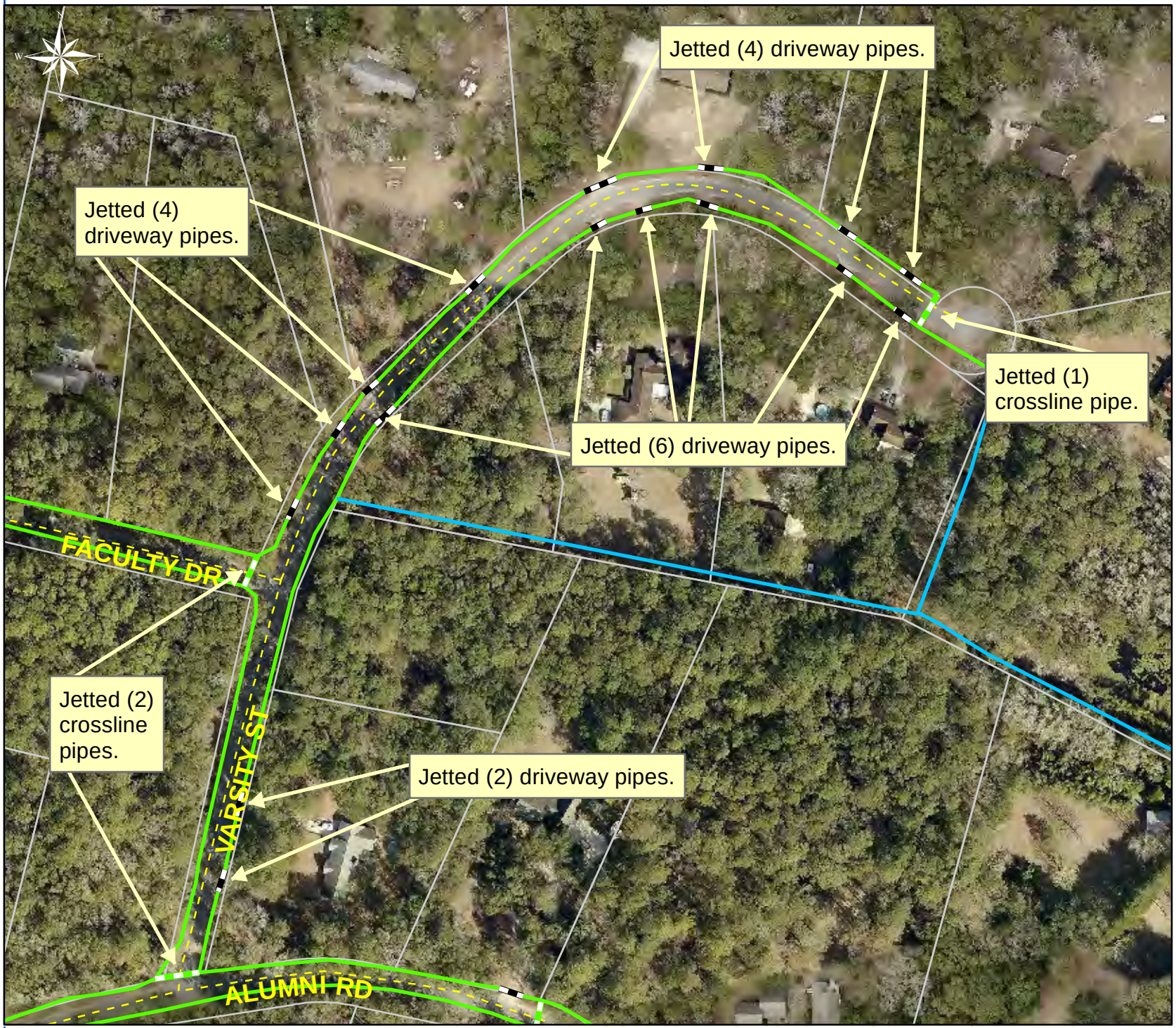
**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 45 90 180 270 360 Feet

**1 inch = 183 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps/Varsity St 2014-621 Map1




# Project: Varsity Street Channel #1 Map 2

**Activity: Vacuum Truck**

**Project #: 2014-621**

**Township: Lady's Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 40 80 160 240 320 Feet

**1 inch = 154 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/17/14
File:C:/sethdata/projects/projectmaps//Vac/Varsity St 201-621 Map2

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Trask Parkway Channel #1

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Apr-14

Project improved 3,559 L.F. of drainage system. Cleaned out 2,975 L.F. of channel and 584 L.F. of lateral ditch. Installed (1) bleeder pipe.

| 2014-609 / Trask Parkway Channel #1 | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| BPINST / Bleeder pipe - Installed | 11.0 | $245.85 | $51.36 | $116.35 | $0.00 | $158.90 | $572.46 |
| HAUL / Hauling | 25.5 | $590.34 | $278.20 | $144.02 | $0.00 | $401.54 | $1,414.10 |
| ODCO / Outfall ditch - cleaned out | 57.0 | $1,234.25 | $325.07 | $121.41 | $0.00 | $816.60 | $2,497.33 |
| ONJV / Onsite Job Visit | 8.0 | $258.76 | $28.96 | $30.70 | $0.00 | $183.28 | $501.70 |
| RB / Remove blockage from flowline | 15.0 | $331.60 | $57.86 | $97.32 | $0.00 | $220.80 | $707.58 |
| **2014-609 / Trask Parkway Channel #1 Sub Total** | **117.0** | **$2,671.03** | **$741.45** | **$509.80** | **$0.00** | **$1,787.72** | **$5,710.00** |
| **Grand Total** | **117.0** | **$2,671.03** | **$741.45** | **$509.80** | **$0.00** | **$1,787.72** | **$5,710.00** |

Before

During

After


# Project: Trask Parkway Channel #1 Map 1

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-609**

**Township: Sheldon**

**Completed: April 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 70 140 280 420 560 Feet

**1 inch = 267 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps/Trask Pkwy 2014-609 Map1


# Project: Trask Parkway Channel #1 Map 2

## Activity: Routine/ Preventive Maintenance

## Project #: 2014-609

## Township: Sheldon

## Completed: April 2014

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 70 140 280 420 560 Feet

**1 inch = 267 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps/Trask Pkwy 2014-609 Map2

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Old Distant Island Road Channel

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

Project improved 650 L.F. of drainage system. Removed blockage from flapgate. Shinn cut and cleaned out 650 L.F. of channel.

| 2014-587 / Old Distant Island Road Channel | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| DLO / Ditch Layout | 38.0 | $839.00 | $129.26 | $67.89 | $0.00 | $394.59 | $1,430.74 |
| HAUL / Hauling | 20.0 | $432.60 | $214.00 | $161.76 | $0.00 | $288.40 | $1,096.76 |
| LM / Loading Materials | 15.0 | $331.62 | $119.96 | $64.03 | $0.00 | $220.80 | $736.41 |
| ODCO / Outfall ditch - cleaned out | 48.0 | $1,002.72 | $567.22 | $356.21 | $0.00 | $654.48 | $2,580.63 |
| ONJV / Onsite Job Visit | 15.0 | $518.68 | $54.30 | $57.00 | $0.00 | $361.33 | $991.31 |
| PRRECON / Project Reconnaissance | 2.0 | $66.36 | $7.24 | $9.00 | $0.00 | $48.94 | $131.54 |
| RB / Remove blockage from flowline | 6.0 | $130.80 | $23.87 | $6.37 | $0.00 | $86.70 | $247.74 |
| WSSHN / Workshelf - Shinn cut | 26.0 | $578.52 | $310.19 | $155.02 | $0.00 | $386.22 | $1,429.95 |
| **2014-587 / Old Distant Island Road Channel Sub Total** | **170.5** | **$3,910.53** | **$1,426.04** | **$877.28** | **$0.00** | **$2,448.07** | **$8,661.92** |
| **Grand Total** | **170.5** | **$3,910.53** | **$1,426.04** | **$877.28** | **$0.00** | **$2,448.07** | **$8,661.92** |

Before

During

After


**Project: Old Distant Island Road**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-587**

**Township: Port Royal Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 60 120 240 360 480 Feet

**1 inch = 229 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/20/14
File:C:/sethdata/projects/projectmaps/Old Distant Is Rd 2014-587

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Huspah Drive

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**
Installed (1) driveway pipe.

**Completion:** May-14

| 2014-618 / Huspah Drive | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| DPINS / Driveway Pipe - Installed | 28.0 | $640.43 | $48.56 | $424.21 | $0.00 | $424.41 | $1,537.61 |
| HAUL / Hauling | 10.0 | $216.30 | $107.00 | $76.08 | $0.00 | $144.20 | $543.58 |
| ONJV / Onsite Job Visit | 7.0 | $208.88 | $25.34 | $6.00 | $0.00 | $127.61 | $367.83 |
| **2014-618 / Huspah Drive Sub Total** | **45.5** | **$1,075.84** | **$180.90** | **$506.29** | **$0.00** | **$702.83** | **$2,465.87** |
| **Grand Total** | **45.5** | **$1,075.84** | **$180.90** | **$506.29** | **$0.00** | **$702.83** | **$2,465.87** |

Before

During

After


**Project: Huspah Drive**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-618**

**Township: Sheldon**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 30 60 120 180 240 Feet

**1 inch = 121 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/11/14
File:C:/sethdata/projects/projectmaps/Huspah Dr 2014-618

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Community Bible Church Channel

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**
Repaired damaged channel pipe.

**Completion:** May-14

| 2014-622 / Community Bible Church | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| HAUL / Hauling | 1.0 | $21.63 | $10.70 | $6.03 | $0.00 | $12.21 | $50.57 |
| OFPR / Outfall Pipe - Repaired | 20.0 | $428.01 | $51.36 | $120.30 | $0.00 | $220.80 | $820.47 |
| ONJV / Onsite Job Visit | 10.0 | $362.80 | $36.20 | $42.00 | $0.00 | $257.70 | $698.70 |
| SD / Soft Digging | 14.0 | $302.79 | $80.96 | $42.85 | $0.00 | $200.76 | $627.36 |
| WSL / Workshelf - Level | 15.0 | $331.60 | $18.10 | $6.74 | $0.00 | $159.75 | $516.19 |
| **2014-622 / Community Bible Church Sub Total** | **60.5** | **$1,457.07** | **$197.32** | **$217.92** | **$0.00** | **$857.83** | **$2,730.14** |
| **Grand Total** | **60.5** | **$1,457.07** | **$197.32** | **$217.92** | **$0.00** | **$857.83** | **$2,730.14** |

Before

During

After


Project: Community Bible Church Channel

Activity: Routine/ Preventive Maintenance

Project #: 2014-622

Township: Port Royal Island

Completed: May 2014

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 30 60 120 180 240 Feet

**1 inch = 123 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/20/14
File:C:/sethdata/projects/projectmaps/Community Bible 2014-622

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Mulrain Road

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

Project improved 525 L.F. of drainage system. Cleaned out (1) catch basin and 525 L.F. of channel. Repaired (1) catch basin.

| **2014-625 / Mulrain Road** | **Labor Hours** | **Labor Cost** | **Equipment Cost** | **Material Cost** | **Contractor Cost** | **Indirect Labor** | **Total Cost** |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| CBCO / Catch basin - clean out | 6.0 | $129.77 | $66.48 | $34.54 | $0.00 | $86.04 | $316.83 |
| CBREP / Catch basin - repaired | 28.0 | $625.56 | $43.44 | $163.13 | $0.00 | $398.04 | $1,230.17 |
| HAUL / Hauling | 13.0 | $302.07 | $139.10 | $170.49 | $0.00 | $203.33 | $814.99 |
| ODCO / Outfall ditch - cleaned out | 48.0 | $1,115.10 | $300.95 | $81.81 | $0.00 | $723.18 | $2,221.04 |
| ONJV / Onsite Job Visit | 7.0 | $212.22 | $25.34 | $21.00 | $0.00 | $133.85 | $392.41 |
| **2014-625 / Mulrain Road Sub Total** | **102.5** | **$2,394.95** | **$575.31** | **$470.97** | **$0.00** | **$1,551.06** | **$4,992.29** |
| **Grand Total** | **102.5** | **$2,394.95** | **$575.31** | **$470.97** | **$0.00** | **$1,551.06** | **$4,992.29** |

Before

During

After


**Project: Mulrain Road**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-625**

**Township: Port Royal Island**

**Completed: May 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 35 70 140 210 280 Feet

**1 inch = 141 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/6/14
File:C:/sethdata/projects/projectmaps/Mulrain Rd 2014-625

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Sanders/ St Helena Island Post Office Channel

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** May-14

Project improved 9 L.F. of drainage system. Installed (1) catch basin, 9 L.F. of channel pipe, rip rap and handseeded for erosion control.

| 2014-629 / Sanders/ St Helena Island Post Office | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| CBINS / Catch basin - installed | 32.0 | $729.84 | $177.20 | $359.06 | $0.00 | $459.12 | $1,725.22 |
| HAUL / Hauling | 10.0 | $216.30 | $107.00 | $269.54 | $0.00 | $144.20 | $737.04 |
| ONJV / Onsite Job Visit | 8.0 | $238.72 | $28.96 | $6.00 | $0.00 | $145.84 | $419.52 |
| PP / Project Preparation | 2.0 | $88.54 | $7.24 | $9.00 | $0.00 | $67.92 | $172.70 |
| SC / Sediment Control | 40.0 | $923.76 | $137.44 | $54.19 | $0.00 | $592.56 | $1,707.95 |
| **2014-629 / Sanders/ St Helena Island Post Office Sub Total** | **92.5** | **$2,207.39** | **$457.84** | **$697.78** | **$0.00** | **$1,416.26** | **$4,779.27** |
| **Grand Total** | **92.5** | **$2,207.39** | **$457.84** | **$697.78** | **$0.00** | **$1,416.26** | **$4,779.27** |

Before

During

After


Project: Sanders/ St. Helena Island Post Office Channel

Activity: Routine/ Preventive Maintenance

Project #: 2014-629

Township: St. Helena Island

Completed: May 2014

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 15 30 60 90 120 Feet

**1 inch = 67 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/16/14
File:C:/sethdata/projects/projectmaps/Sanders PO Channel 2014-629

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Polite Drive

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Jun-14

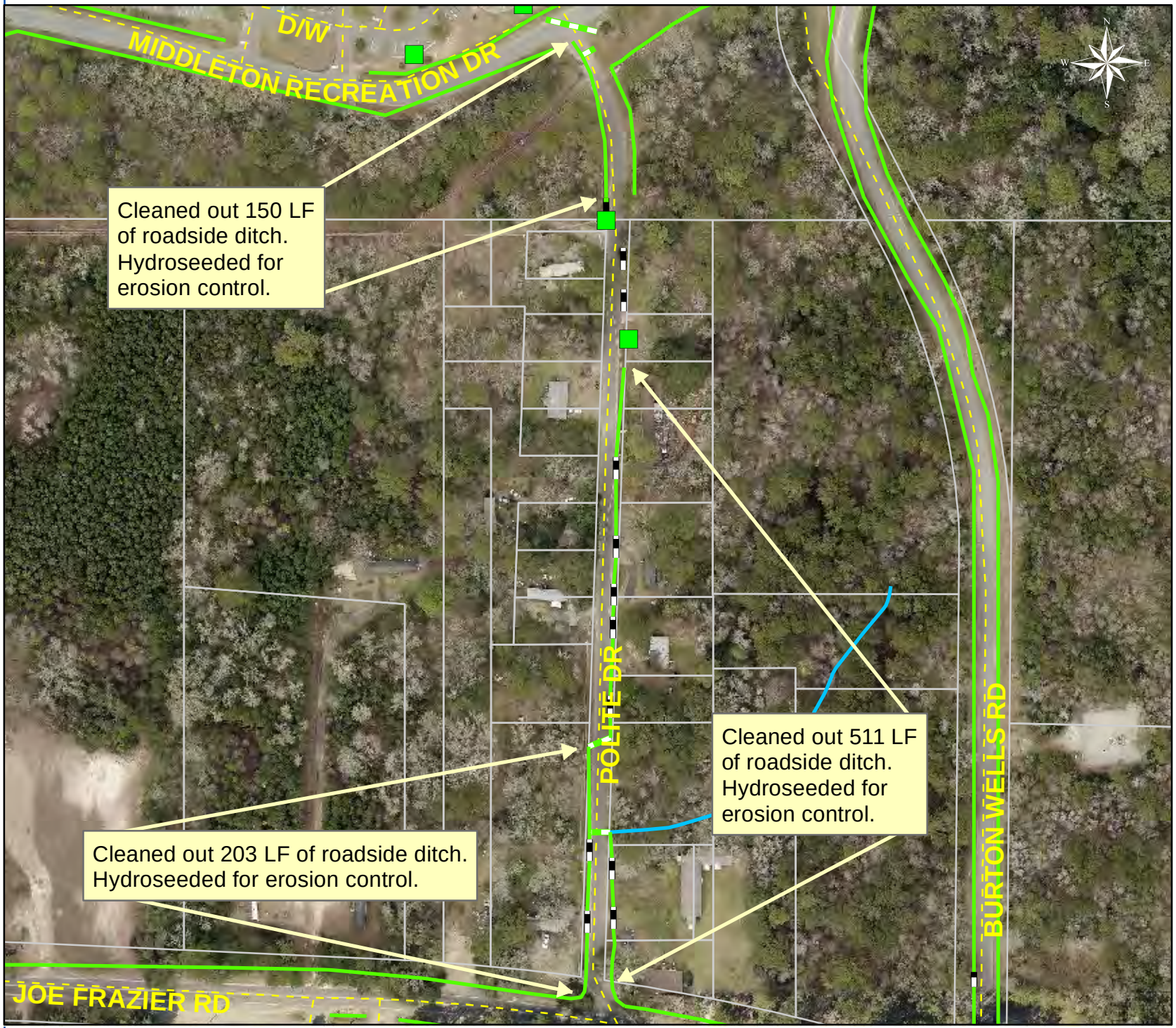
Project improved 864 L.F. of drainage system. Cleaned out 864 L.F. of roadside ditch. Hydroseeded for erosion control.

| 2014-628 / Polite Drive | Labor Hours | Labor Cost | Equipment Cost | Material Cost | Contractor Cost | Indirect Labor | Total Cost |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| EDO / Equipment Drop Off | 4.0 | $91.74 | $21.40 | $6.74 | $0.00 | $62.20 | $182.08 |
| HAUL / Hauling | 18.0 | $389.34 | $192.60 | $86.91 | $0.00 | $259.56 | $928.41 |
| HYDR / Hydroseeding | 6.0 | $143.88 | $19.68 | $106.40 | $0.00 | $92.74 | $362.70 |
| ONJV / Onsite Job Visit | 3.0 | $103.95 | $10.86 | $6.00 | $0.00 | $70.42 | $191.23 |
| PRRECON / Project Reconnaissance | 1.0 | $29.84 | $3.62 | $3.00 | $0.00 | $18.23 | $54.69 |
| RSDCL / Roadside Ditch - Cleanout | 76.5 | $1,760.30 | $390.98 | $100.93 | $0.00 | $1,126.09 | $3,378.29 |
| SVCREQ / Service Request | 2.0 | $88.54 | $7.24 | $0.00 | $0.00 | $67.92 | $163.70 |
| TRAIN / Training | 4.0 | $77.12 | $0.00 | $0.00 | $0.00 | $48.84 | $125.96 |
| UTLOC / Utility locates | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| **2014-628 / Polite Drive** | **115.5** | **$2,705.17** | **$646.38** | **$309.98** | **$0.00** | **$1,759.23** | **$5,420.75** |
| **Grand Total** | **115.5** | **$2,705.17** | **$646.38** | **$309.98** | **$0.00** | **$1,759.23** | **$5,420.75** |

Before

During

After




**Project: Polite Drive**

**Activity: Routine/ Preventive Maintenance**

**Project #: 2014-628**

**Township: Port Royal Island**

**Completed: June 2014**

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe

0 40 80 160 240 320 Feet

**1 inch = 171 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/20/14
File:C:/sethdata/projects/projectmaps/Polite Dr 2014-628

# Beaufort County
# Public Works
## *Stormwater Infrastructure*
*Project Summary*

**Project Summary:** Okatie East Retrofit (Rework)

**Activity:** Routine/Preventive Maintenance

**Narrative Description of Project:**

**Completion:** Apr-14

Removed blockage from flowline. Repaired washout. Installed rip rap for erosion control.

| **2012-006R / Okatie East Retrofit (Rework)** | **Labor Hours** | **Labor Cost** | **Equipment Cost** | **Material Cost** | **Contractor Cost** | **Indirect Labor** | **Total Cost** |
|---|---|---|---|---|---|---|---|
| AUDIT / Audit Project | 0.5 | $10.23 | $0.00 | $0.00 | $0.00 | $6.62 | $16.85 |
| HAUL / Hauling | 6.0 | $133.32 | $64.20 | $1,557.03 | $0.00 | $89.10 | $1,843.65 |
| ONJV / Onsite Job Visit | 7.0 | $208.88 | $25.34 | $11.72 | $0.00 | $127.61 | $373.55 |
| PRRECON / Project Reconnaissance | 8.0 | $252.08 | $14.48 | $8.20 | $0.00 | $170.80 | $445.56 |
| RPWO / Repaired Washout | 10.0 | $229.30 | $93.26 | $44.72 | $0.00 | $154.65 | $521.93 |
| **2012-006R / Okatie East Retrofit (Rework) Sub Total** | **43.5** | **$1,099.09** | **$211.76** | **$1,645.11** | **$0.00** | **$725.41** | **$3,681.38** |
| **Grand Total** | **43.5** | **$1,099.09** | **$211.76** | **$1,645.11** | **$0.00** | **$725.41** | **$3,681.38** |

Before

During

After


Project: Okatie East Retrofit - Rework

Activity: Routine/ Preventive Maintenance

Project #: 2012-006R

Township: Bluffton

Completed: April 2014

**Legend**

**TYPE**

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe
- Headwall
- Concrete Box

0 50 100 200 300 400 Feet

**1 inch = 207 feet**

Prepared By: BC Stormwater Management Utility
Date Print: 6/10/14
File:C:/sethdata/projects/projectmaps/Okatie East Rework 2014-006R

Vulnerability and Consequences Adaptation Planning Scenario (VCAPS) for Beaufort Co., SC
Research by S.C. Sea Grant Consortium

Results of the "priority actions to address sea level rise" survey

| Ranking | Action | Weighted Score |
|---|---|---|
| 1 | maintain setback policy on growing shorelines | 63 |
| 2 | improve coordination with relevant state agencies (DHEC, DOT, etc.) | 62 |
| 3 | provide disclosure notice that the county will not be held liable for damages to high risk properties or from not maintaining services | 55 |
| 4 | use sea level rise information to inform disaster recovery plan | 52 |
| 5 | elevate existing roads and causeways | 51 |
| 6 | begin a dialogue on how to balance public & private interests | 48 |
| 7 | coordinate efforts with municipalities | 46 |
| 8 | Identify planning thresholds (i.e. determine when sea level rise should be addressed by policy) | 46 |
| 9 | change road elevation requirements | 45 |
| 10 | provide sea level rise information on county website to inform & educate | 42 |
| 11 | collect more information (on flooding locations, sea level trends, erosion patterns, infrastructure vulnerabilities, etc.) | 36 |
| 12 | Improve regional planning efforts | 35 |
| 13 | revise building codes to higher quality standards & use incentives | 35 |
| 14 | consider social & cultural vulnerability & resilience | 30 |
| 15 | establish new regulations for septic systems | 23 |
| 16 | monitor the health of salt marshes | 22 |
| 17 | require lagoon / storm water pond maintenance | 22 |
| 18 | establish funding structures and/or tax districts to help property owners | 21 |
| 19 | develop affordable housing in safer areas | 14 |
| 20 | control water access points through low-lying ditches | 10 |
| 21 | restore ferry services to isolated communities | 9 |
| 22 | develop a transfer of development rights program for low elevation properties | 5 |
| 23 | increase awareness of the Open Lands Trust fund | 2 |
| 24 | install tidal gates | 2 |
| 25 | purchase lower elevation lands | 1 |
| 26 | assist with beach renourishment | |
| 27 | purchase higher elevation lands | |

# Sea Level Rise Impacts in Beaufort County

Sean Bath

S.C. Sea Grant Consortium




# Outline

- Data Source & Accuracy
- Review – Sea Level Rise
- Extreme High Tides
- GIS Mapping: Where will it flood?
- Vulnerability of…
  - Causeways & Low Traffic Roads
  - Arterial Roads / Evacuation Routes
  - County facilities
  - Future Land Use Areas
  - Property
  - Marsh

# Data Source & Accuracy

- Data from Coastal Services Center Digital Coast http://www.csc.noaa.gov/digitalcoast/
- Beaufort elevations based on local LiDAR data
- Horizontal resolution of 3.2 ft.
- Vertical accuracy within +/- 3 in.
- Some features can decrease accuracy (i.e. marsh grasses)
- “Bathtub” model does not consider factors like human response, marsh response, or erosion/accretion.

# Review – Sea Level Rise

- There is no widely accepted method currently available for producing probabilistic projections of "relative" sea level rise at local and regional scales (Parris et.al., 2012)
- We rely on projections of global average sea level to plan for future sea level rise.
- Primary drivers of future change:
  - Melting & breaking off of glaciers & ice
  - Expansion of ocean water due to warming
- Vertical land movement is occurring at a slow, steady pace.
  - The S.C. coast is slowly sinking, but this was already a factor of historical sea level change.
  - Excessive groundwater withdrawal can become an issue in specific areas.

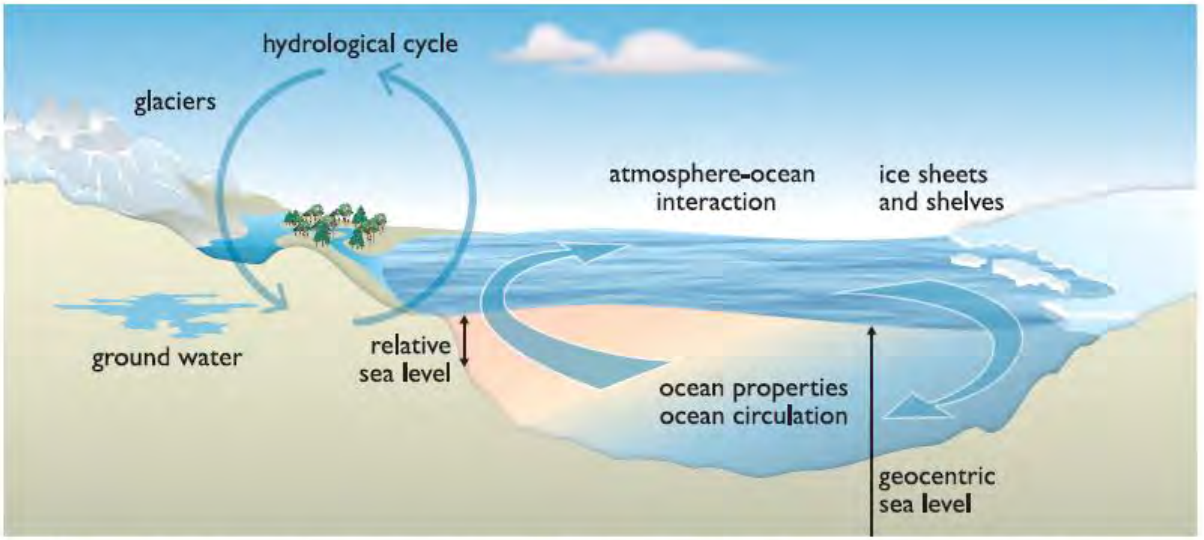
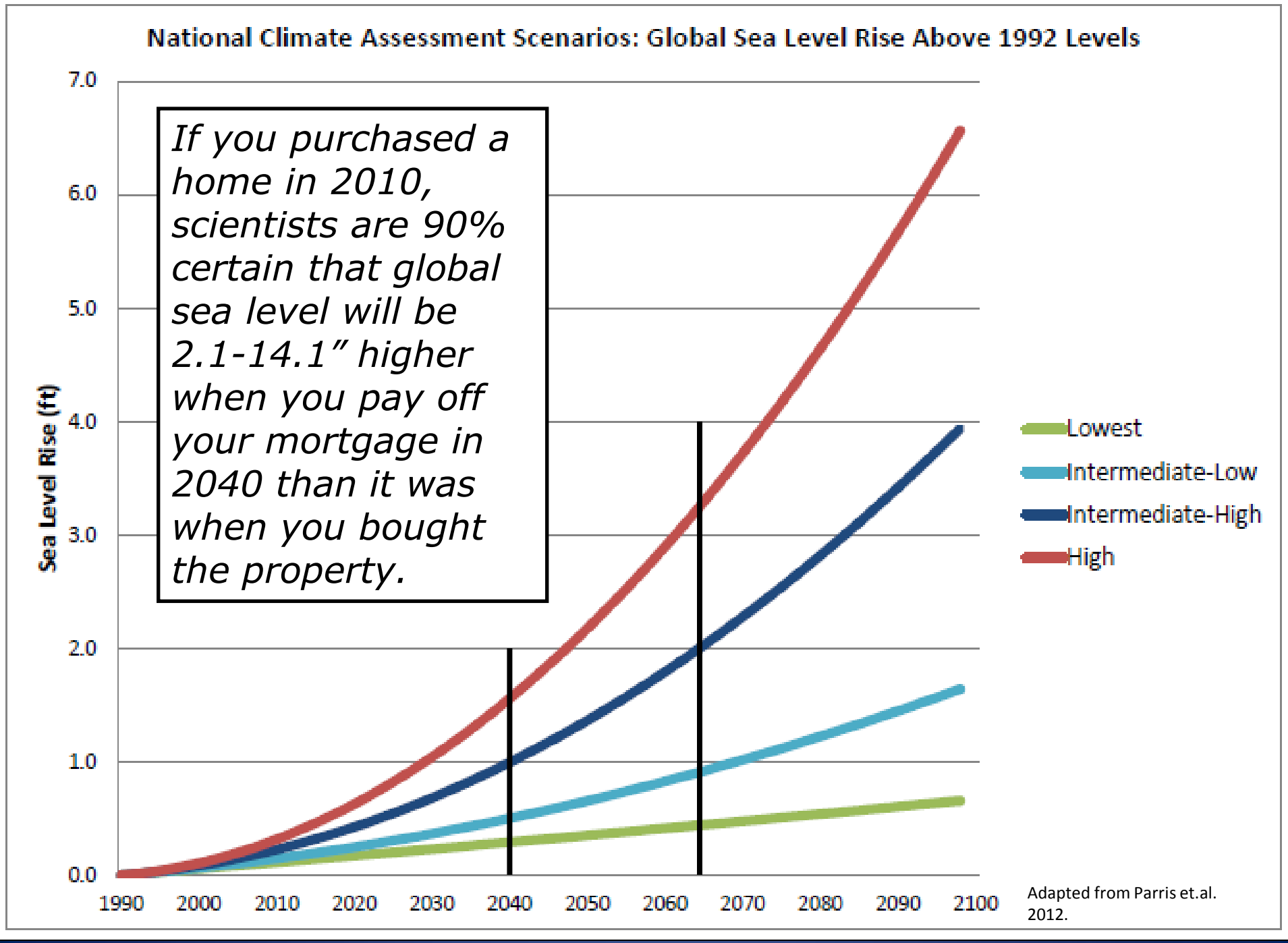



**Figure 13.1 |** Climate-sensitive processes and components that can influence global and regional sea level and are considered in this chapter. Changes in any one of the components or processes shown will result in a sea level change. The term 'ocean properties' refers to ocean temperature, salinity and density, which influence and are dependent on ocean circulation. Both relative and geocentric sea level vary with position. Note that the geocenter is not shown.

Source: Church et. al. 2013. Includes climate-sensitive processes that can influence global and regional sea level.

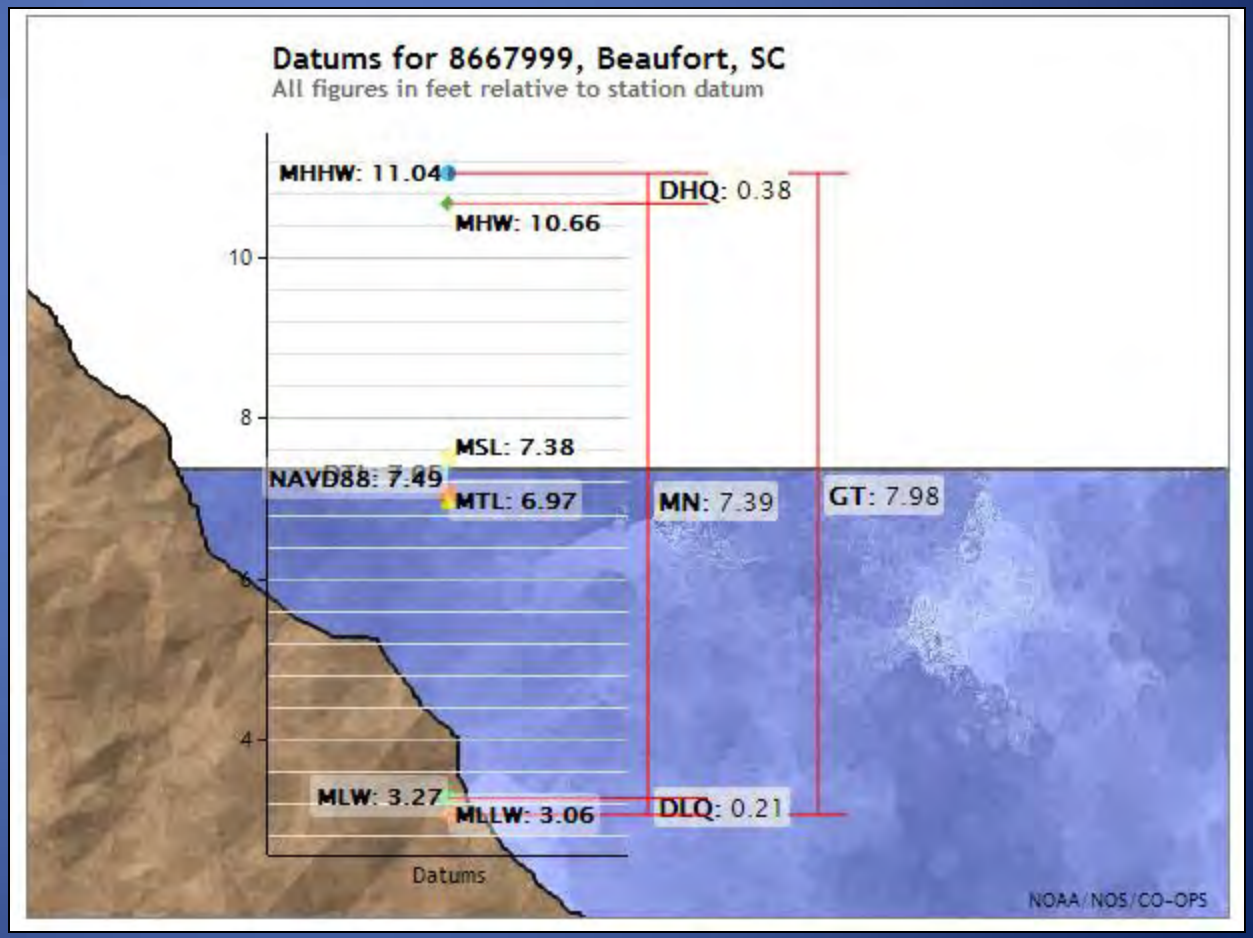

National Climate Assessment Scenarios: Global Sea Level Rise Above 1992 Levels
If you purchased a home in 2010, scientists are 90% certain that global sea level will be 2.1-14.1" higher when you pay off your mortgage in 2040 than it was when you bought the property.
Sea Level Rise (ft)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
Lowest
Intermediate-Low
Intermediate-High
High
Adapted from Parris et.al. 2012.

# Tidal Datums

Mean Higher High Water
The average of the elevations of the higher of the two daily high tides from 1983 to 2001.

*Adding sea level rise to MHHW assumes tidal range remains the same*

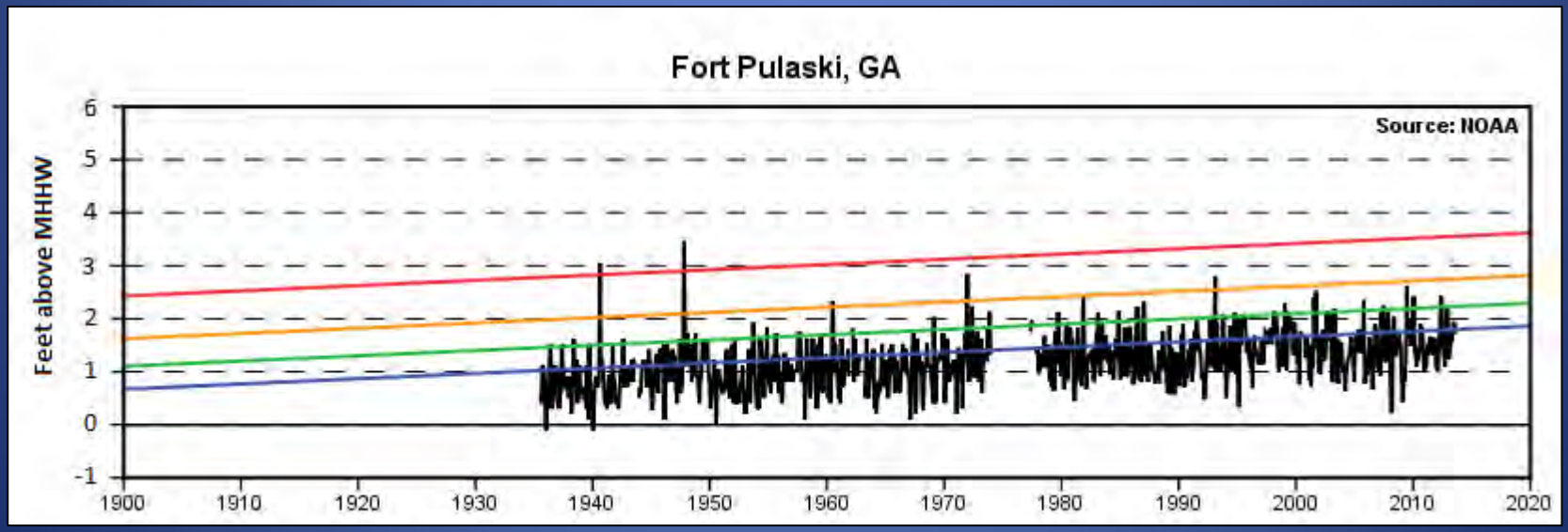
*Mapping of MHHW uses all tidal stations in Beaufort County & interpolates the value between the stations*




This figure is an example of the tidal datum at one particular station in the county.

# Extreme High Tides

- Extreme tides are common.
- Likelihood of at *least* one tide above MHHW in given year
  - 99/100 years: ~1.5 ft.
  - 50/100 years: ~2 ft.
  - 10/100 years: ~2.5 ft.
  - 1/100 years: 3.28 ft.

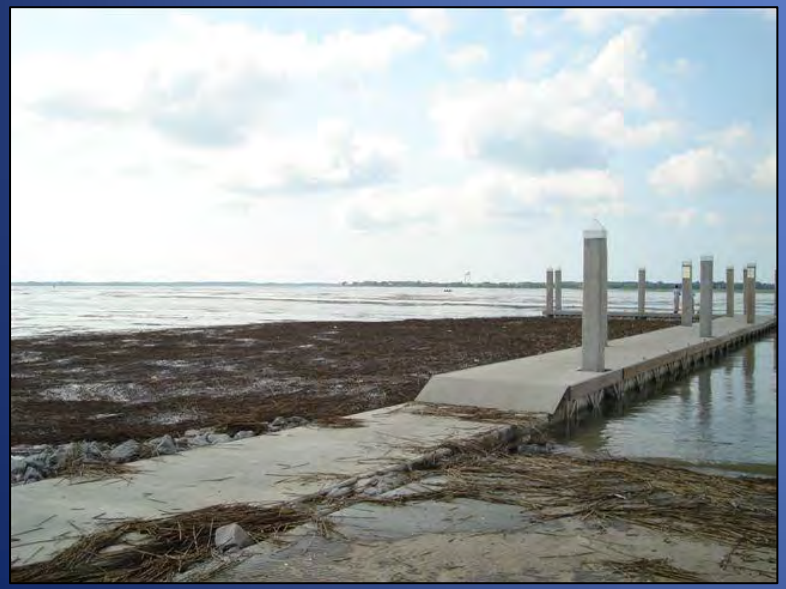


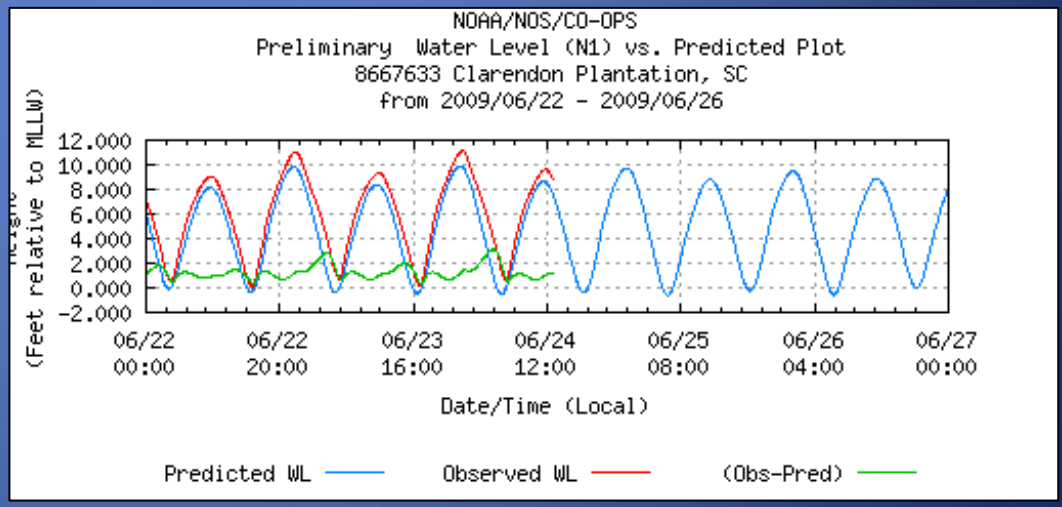

This graph plots the highest tide recorded every month since the 1930's. Measurements are feet above mean higher high water.

Source: http://tidesandcurrents.noaa.gov/

# What does this mean on the ground?

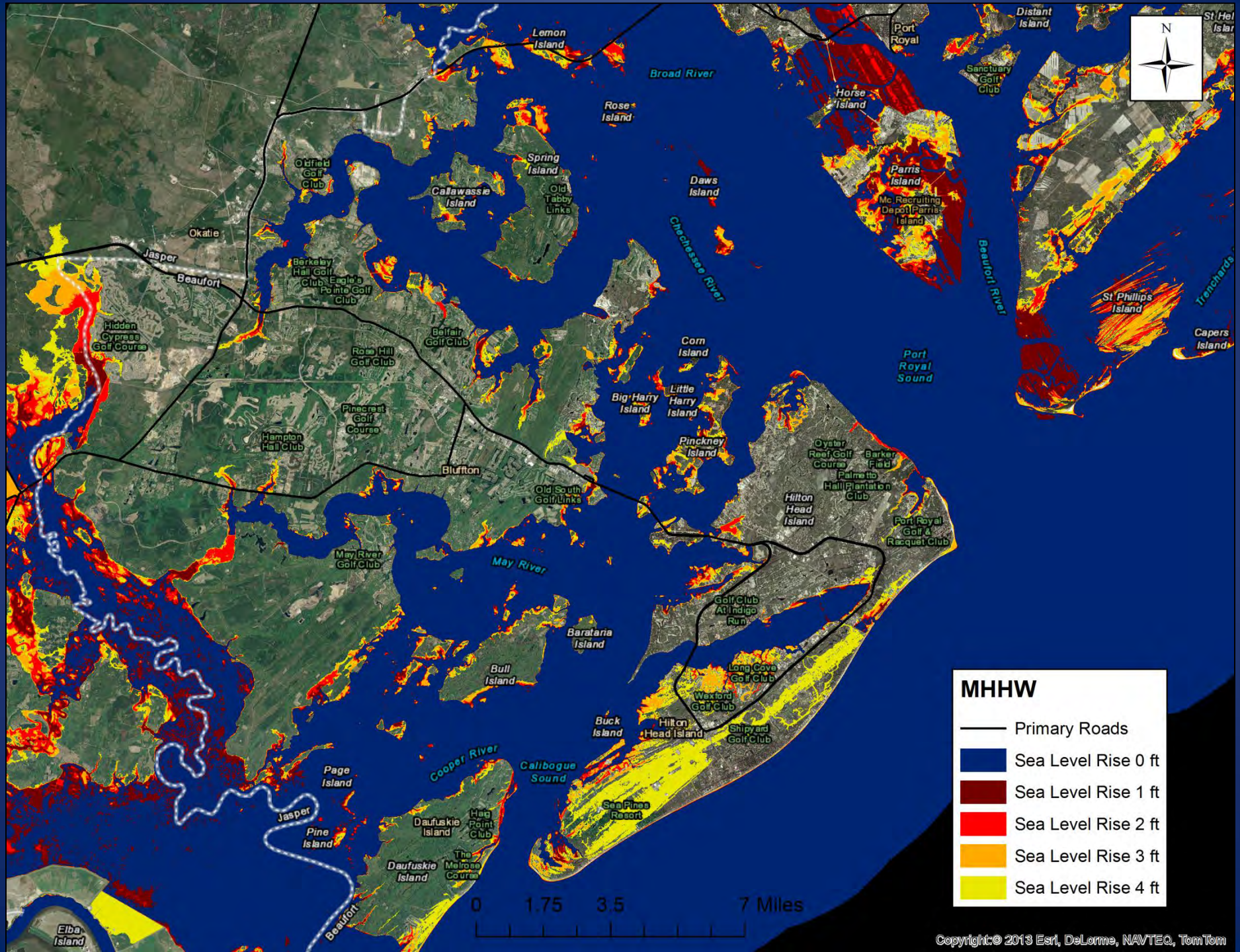
- June 22-25, 2009: Tide exceeded MHHW by 2.5 ft. (Eddie Bellamy, Public Works Dept.)
- This happens every 10 years, but may happen more than once within the year.





# GIS Mapping: Where will it flood?

- Big-picture views of the county
  - South section
  - Middle section
  - North section
- Each color represents a different amount of feet above MHHW up to 4 ft.
- These water levels may be reached in the real world via sea level rise, extreme tides, storm surge, or a combination of these.
- The highest value recorded at Beaufort, SC station was 3.69 ft. above current MHHW levels. This occurred on September 4, 1979 (Hurricane David)


MHHW
Primary Roads
Sea Level Rise 0 ft
Sea Level Rise 1 ft
Sea Level Rise 2 ft
Sea Level Rise 3 ft
Sea Level Rise 4 ft
N
0 1.75 3.5 7 Miles
Broad River
Port Royal Sound
Beaufort River
Chechessee River
Cooper River
Calibogue Sound
May River
Lemon Island
Rose Island
Spring Island
Callawassie Island
Daws Island
Parris Island
Port Royal
Distant Island
Horse Island
Sanctuary Golf Club
Mc Recruiting Depot Parris Island
St Phillips Island
Capers Island
Trenchards
Corn Island
Big Harry Island
Little Harry Island
Pinckney Island
Hilton Head Island
Oyster Reef Golf Course
Barker Field
Palmetto Hall Plantation Club
Port Royal Golf & Racquet Club
Golf Club At Indigo Run
Long Cove Golf Club
Wexford Golf Club
Shipyard Golf Club
Sea Pines Resort
Barataria Island
Bull Island
Buck Island
Bluffton
Old South Golf Links
Hampton Hall Club
Pinecrest Golf Course
Rose Hill Golf Club
Belfair Golf Club
Berkeley Hall Golf Club
Eagle's Pointe Golf Club
Oldfield Golf Club
Old Tabby Links
Hidden Cypress Golf Course
Okatie
Jasper
Beaufort
May River Golf Club
Page Island
Pine Island
Daufuskie Island
Haig Point Club
The Melrose Course
Elba Island
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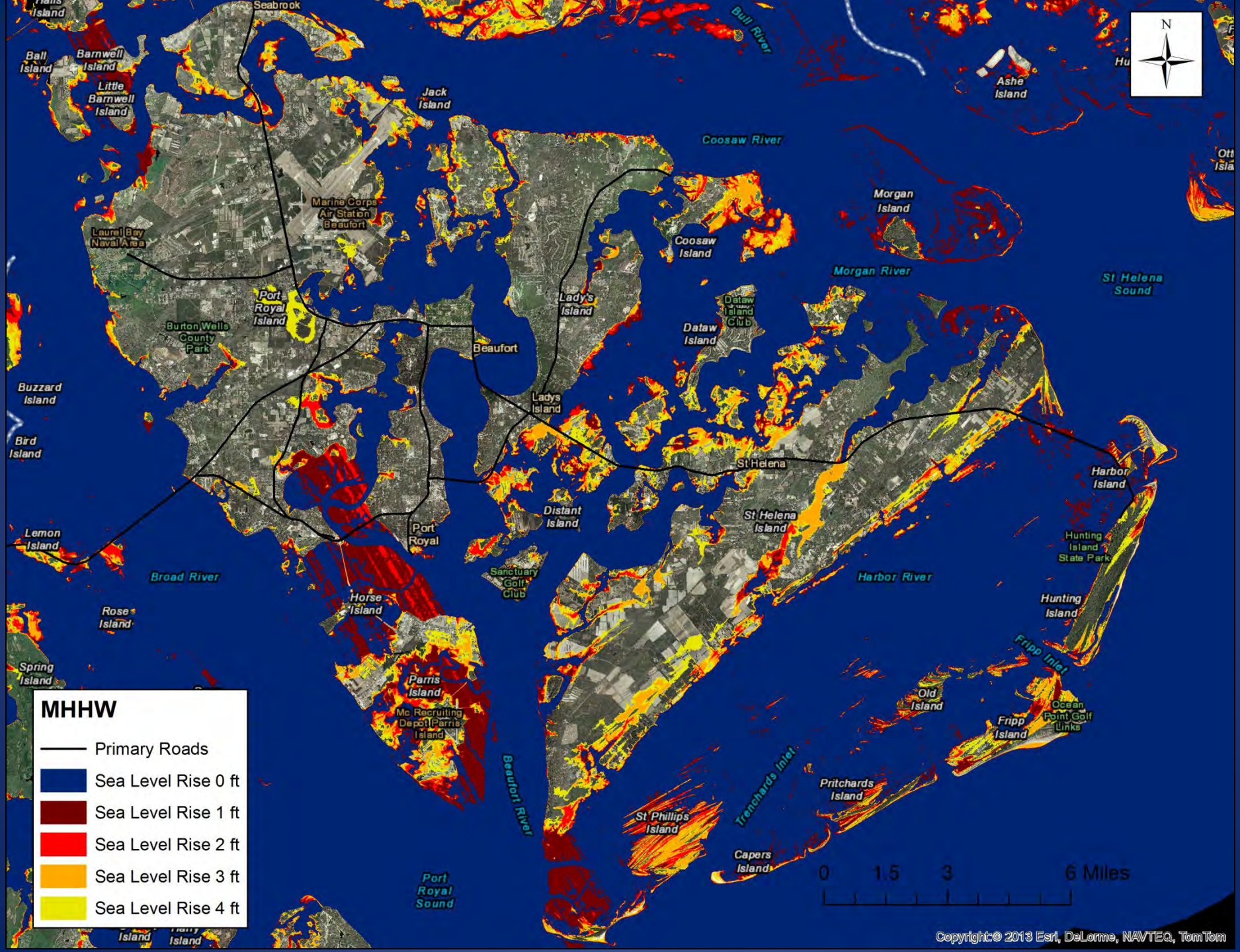
MHHW
Primary Roads
Sea Level Rise 0 ft
Sea Level Rise 1 ft
Sea Level Rise 2 ft
Sea Level Rise 3 ft
Sea Level Rise 4 ft
N
0 1.5 3 6 Miles
Seabrook
Bull River
Ball Island
Barnwell Island
Little Barnwell Island
Jack Island
Ashe Island
Coosaw River
Marine Corps Air Station Beaufort
Laurel Bay Naval Area
Morgan Island
Coosaw Island
Morgan River
St Helena Sound
Port Royal Island
Lady's Island
Dataw Island Club
Dataw Island
Burton Wells County Park
Beaufort
Buzzard Island
Ladys Island
Bird Island
St Helena
Harbor Island
Distant Island
St Helena Island
Port Royal
Lemon Island
Hunting Island State Park
Broad River
Sanctuary Golf Club
Harbor River
Horse Island
Hunting Island
Rose Island
Fripp Inlet
Spring Island
Parris Island
Old Island
Mc Recruiting Depot Parris Island
Ocean Point Golf Links
Fripp Island
Beaufort River
Trenchards Inlet
Pritchards Island
St Phillips Island
Capers Island
Port Royal Sound
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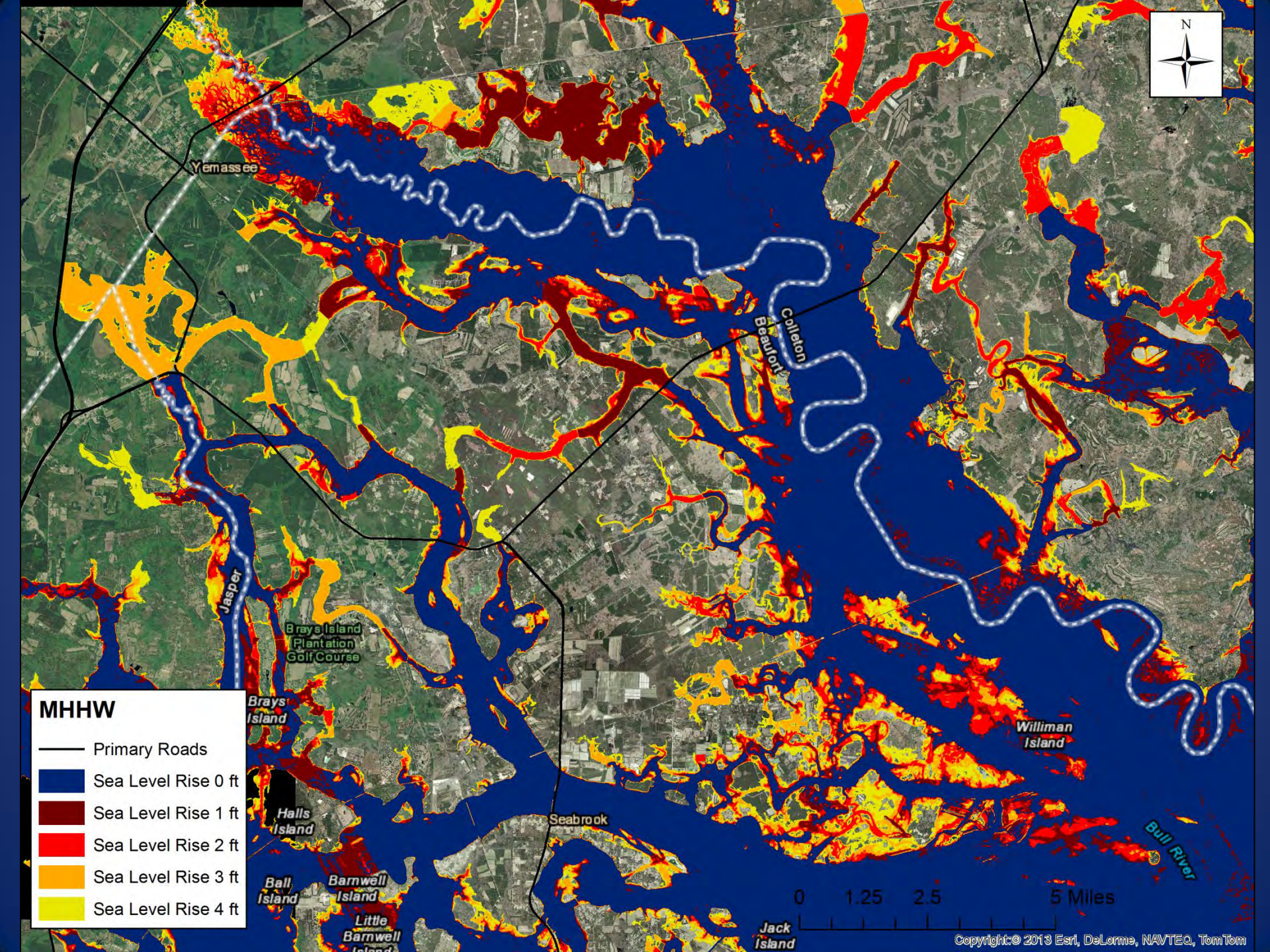
N
Yemassee
Colleton
Beaufort
Jasper
Brays Island
Plantation
Golf Course
Brays
Island
Halls
Island
Seabrook
Ball
Island
Barnwell
Island
Little
Barnwell
Island
Jack
Island
Williman
Island
Bull River
MHHW
Primary Roads
Sea Level Rise 0 ft
Sea Level Rise 1 ft
Sea Level Rise 2 ft
Sea Level Rise 3 ft
Sea Level Rise 4 ft
0
1.25
2.5
5 Miles
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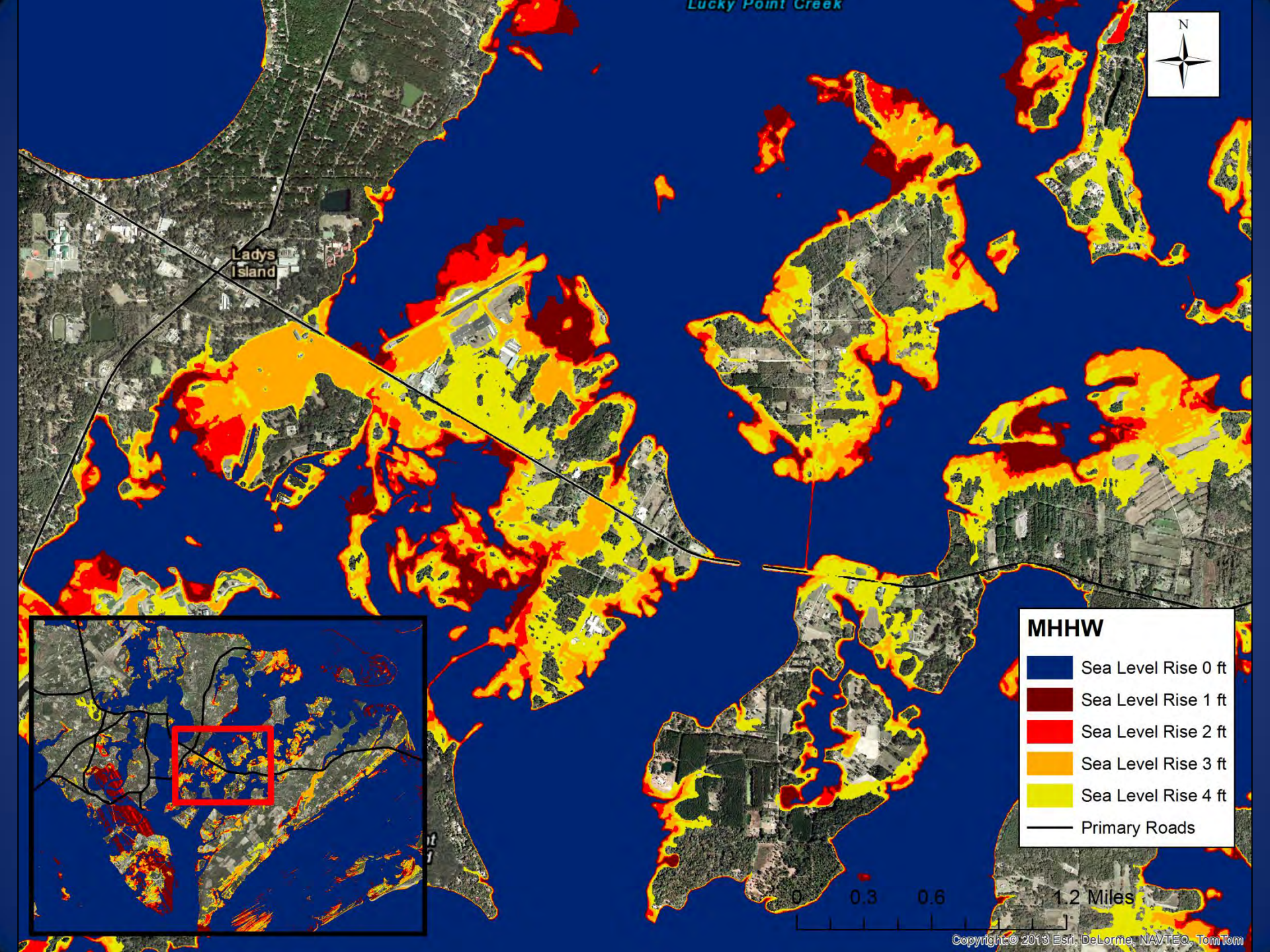
# Causeways & Low Traffic Roads

- SCDOT Paved Road Over-toppings
  - Eddings Point Road, Warsaw Island Drive, & Seaside Road
- County Road Over-toppings
  - Rose Island Road, Coosaw Island Drive, Witsell Road, Seigler Road, Paulkie Island Road, Shed Road, Cee Cee Road, Airport Circle, Half Moon Island Road, Bridgewood Road, Coastal Seafood Road, & Jenkins Port Road
- County Boat Landing Flooding
  - Sands, Broad River, Edgar Glenn, & Alljoy

*100% of these are flooded on the GIS model at +2 ft.*


Lucky Point Creek
Ladys Island
N
MHHW
Sea Level Rise 0 ft
Sea Level Rise 1 ft
Sea Level Rise 2 ft
Sea Level Rise 3 ft
Sea Level Rise 4 ft
Primary Roads
0
0.3
0.6
1.2 Miles
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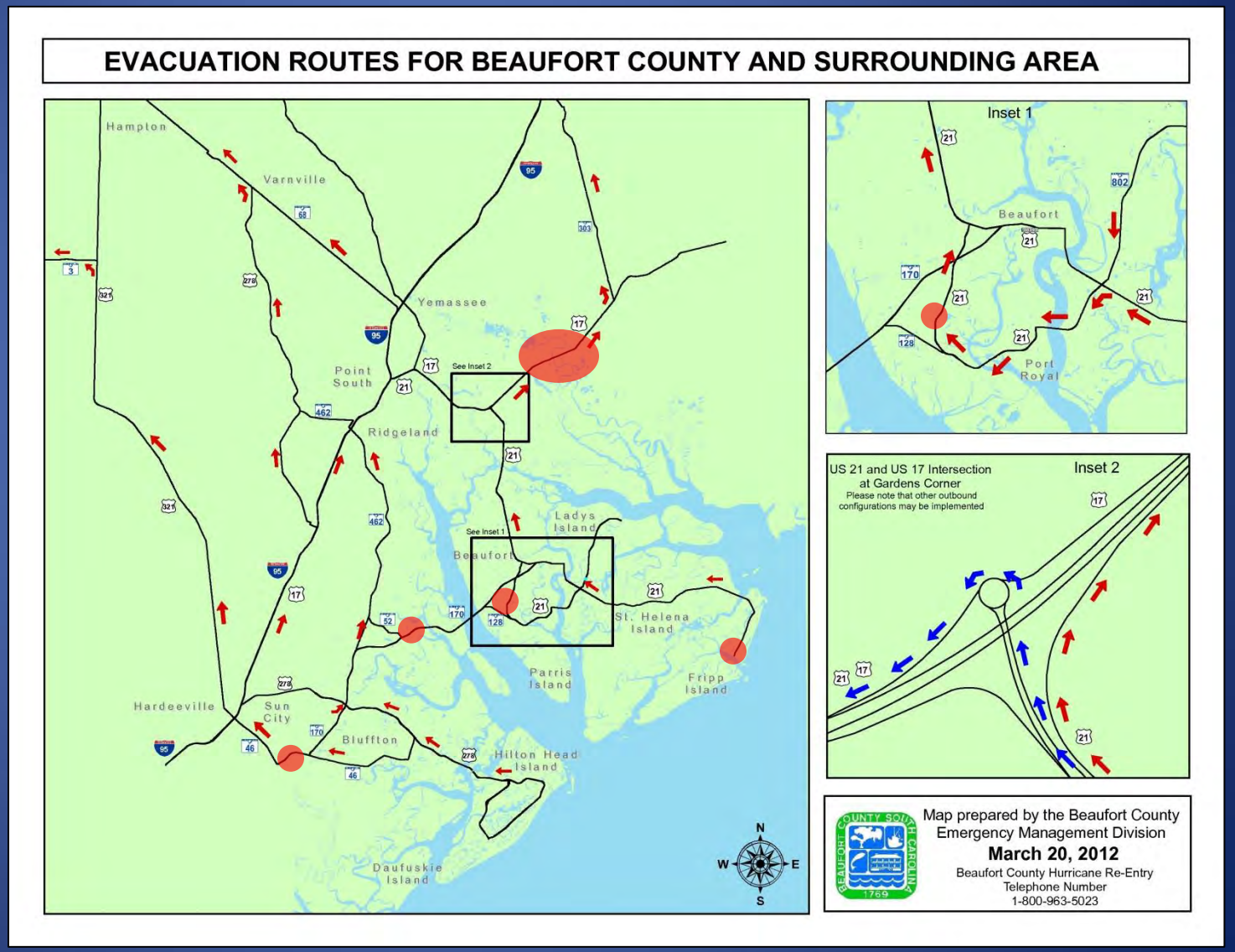
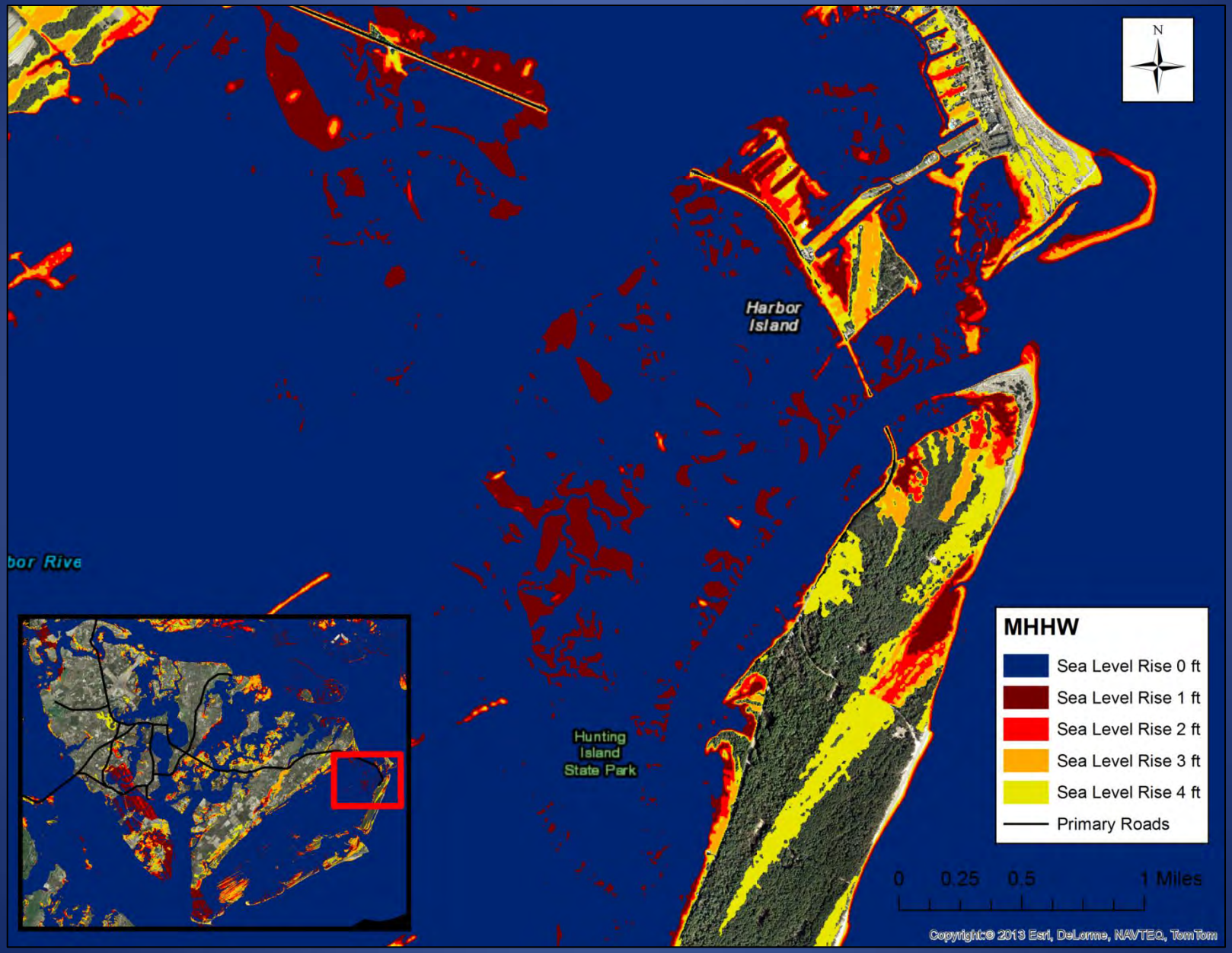
# Arterial Roads / Evacuation Routes

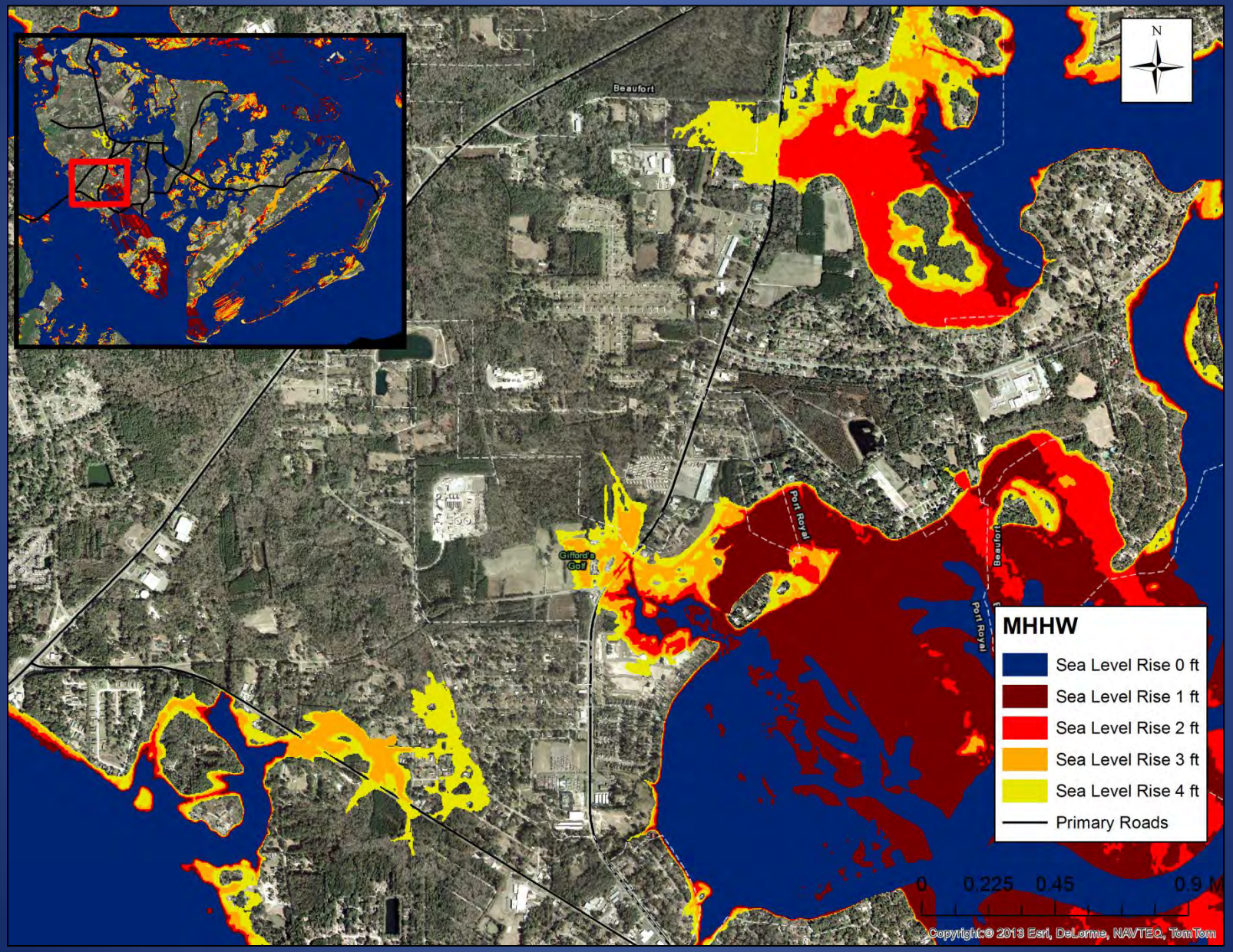
The red circles identify arterial roads & evacuation routes susceptible to flooding at 2 ft.



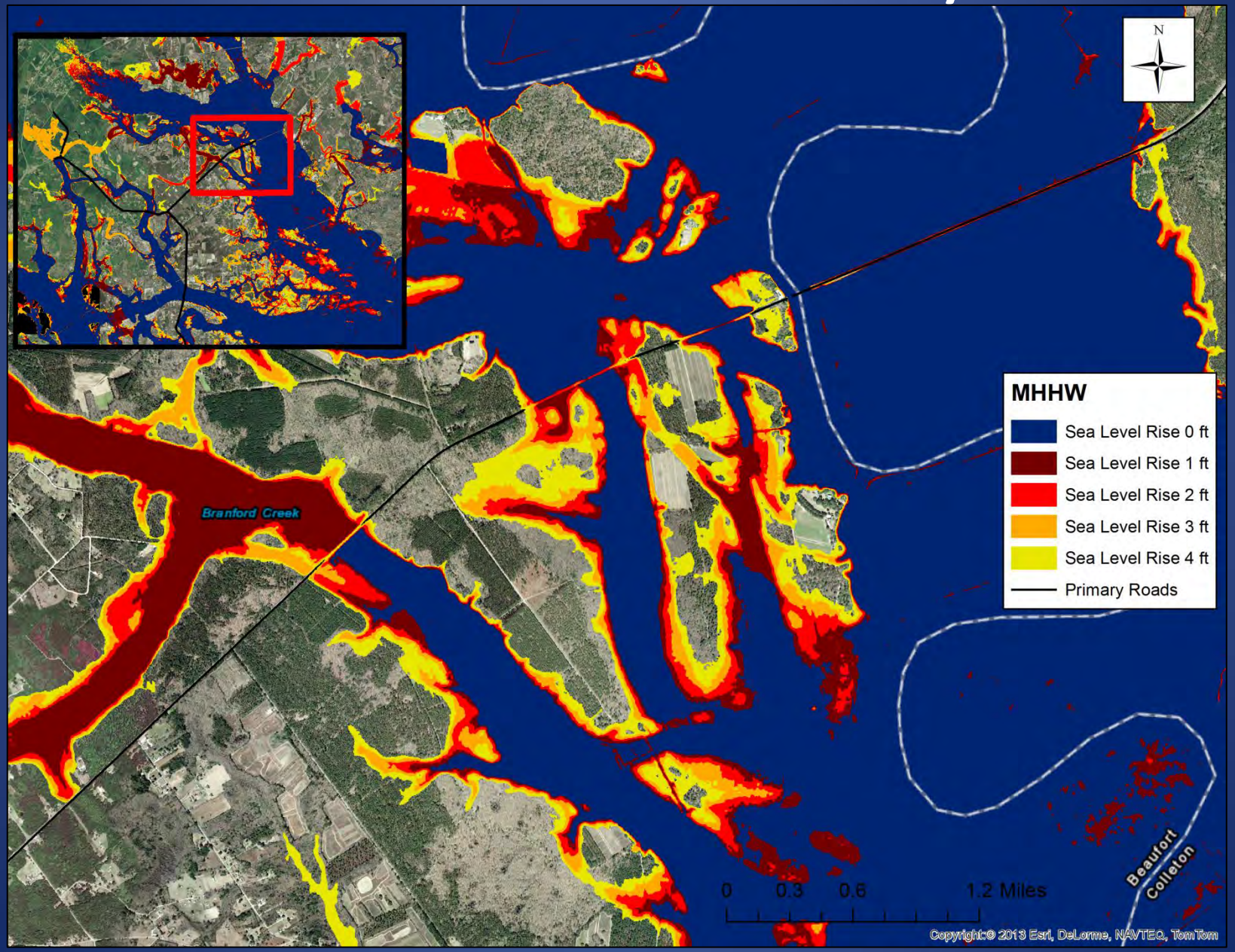
# US 21 at Hunting Island State Park



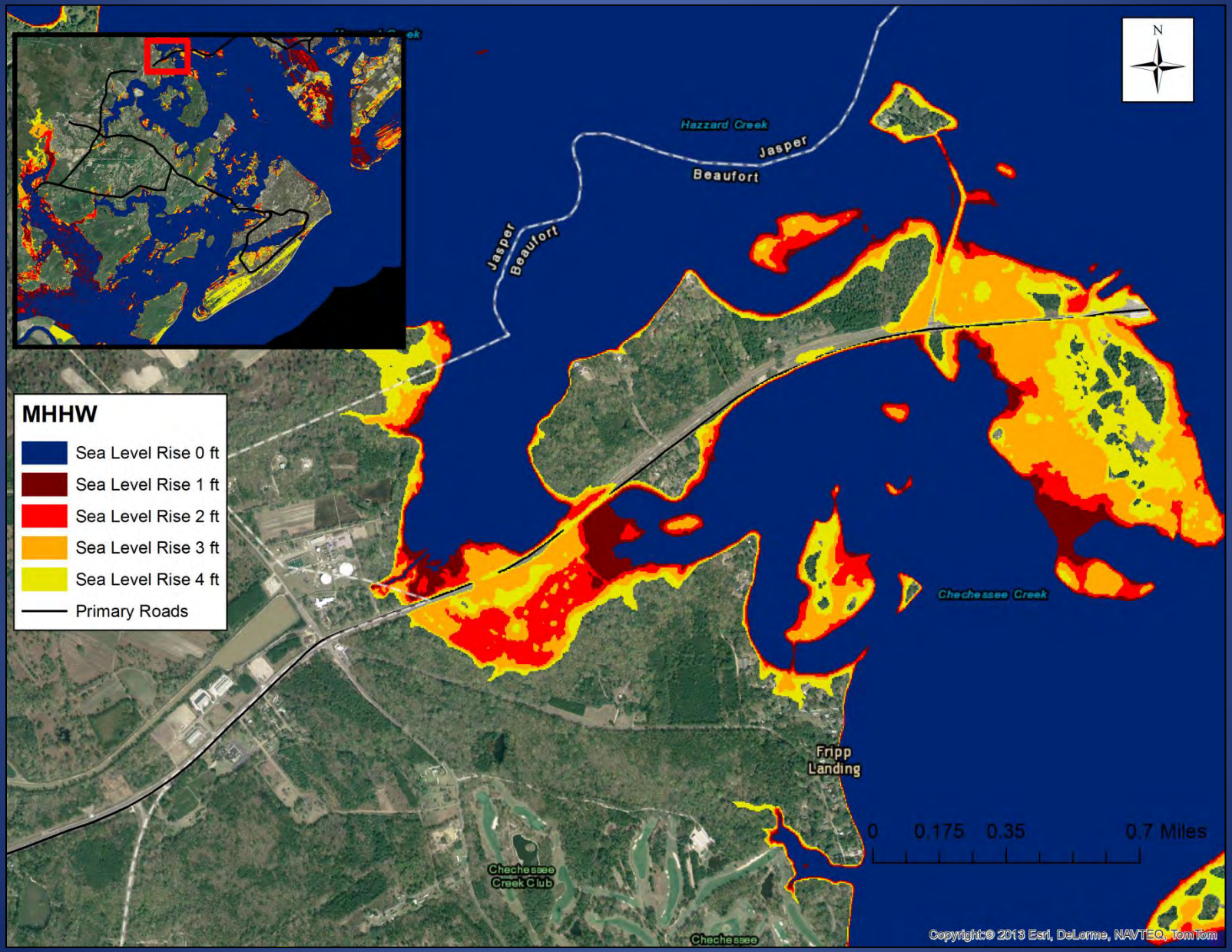
# SC 280 Parris Island Gateway



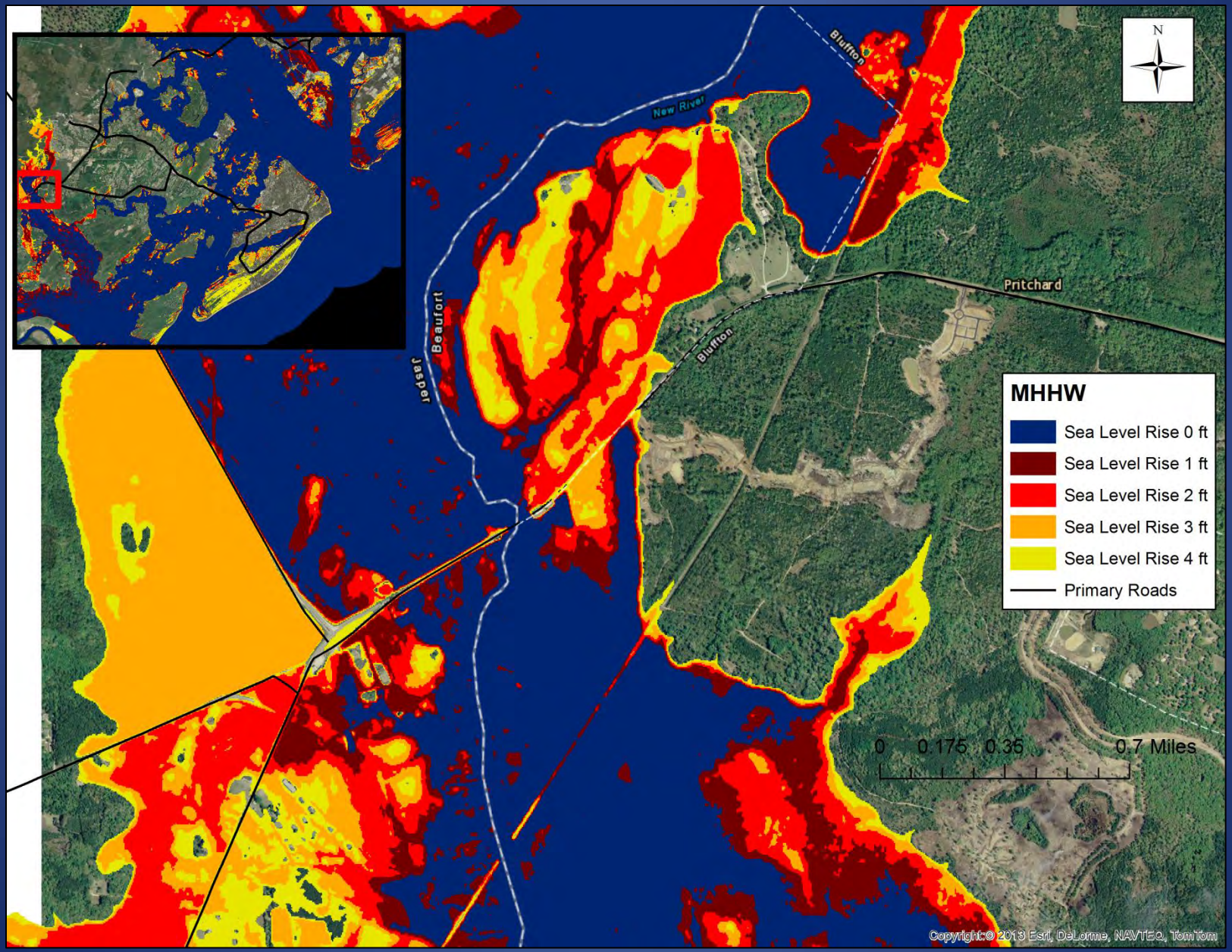
# US-17 at Colleton County Line



# SC 170 Okatie Highway



# SC 170 at New River



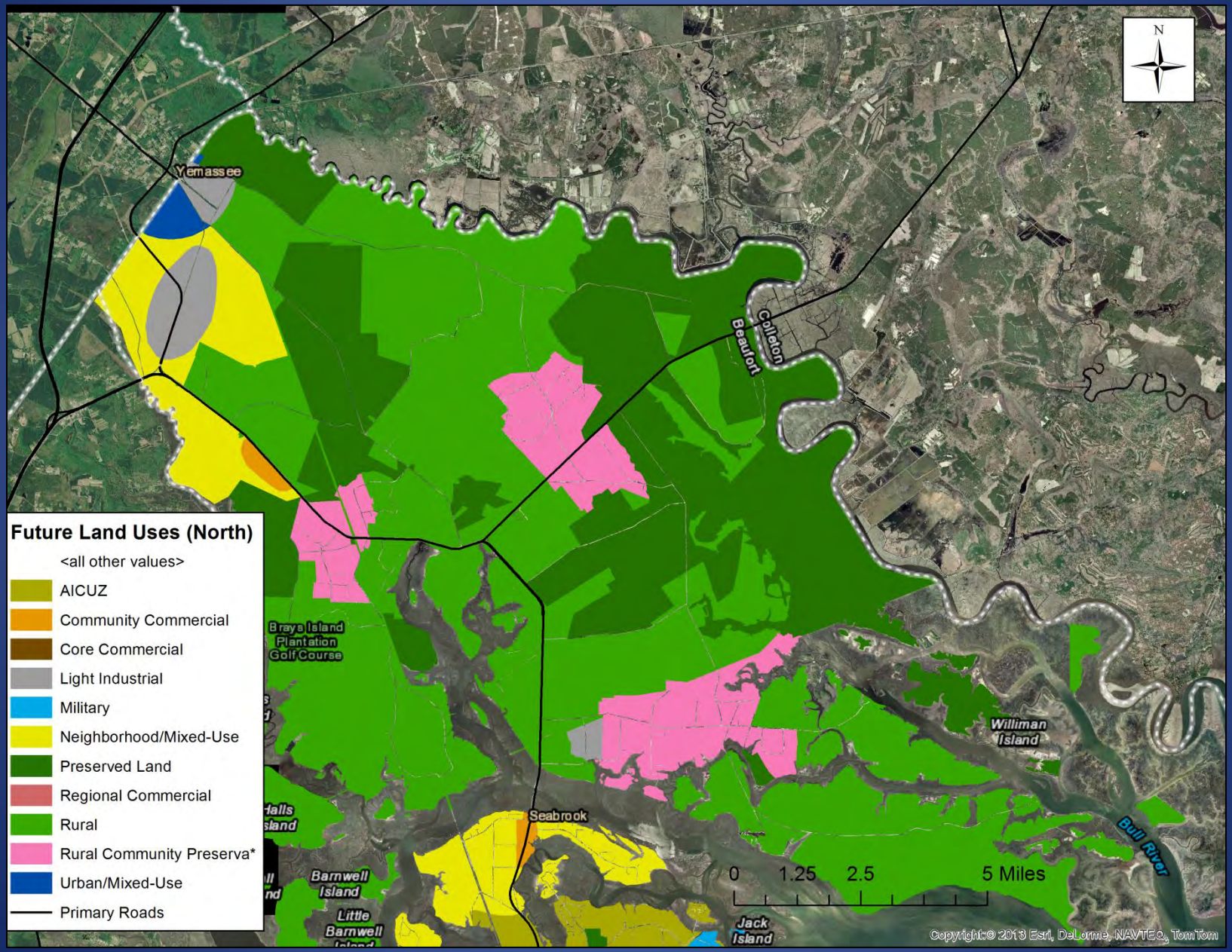
# County Facilities

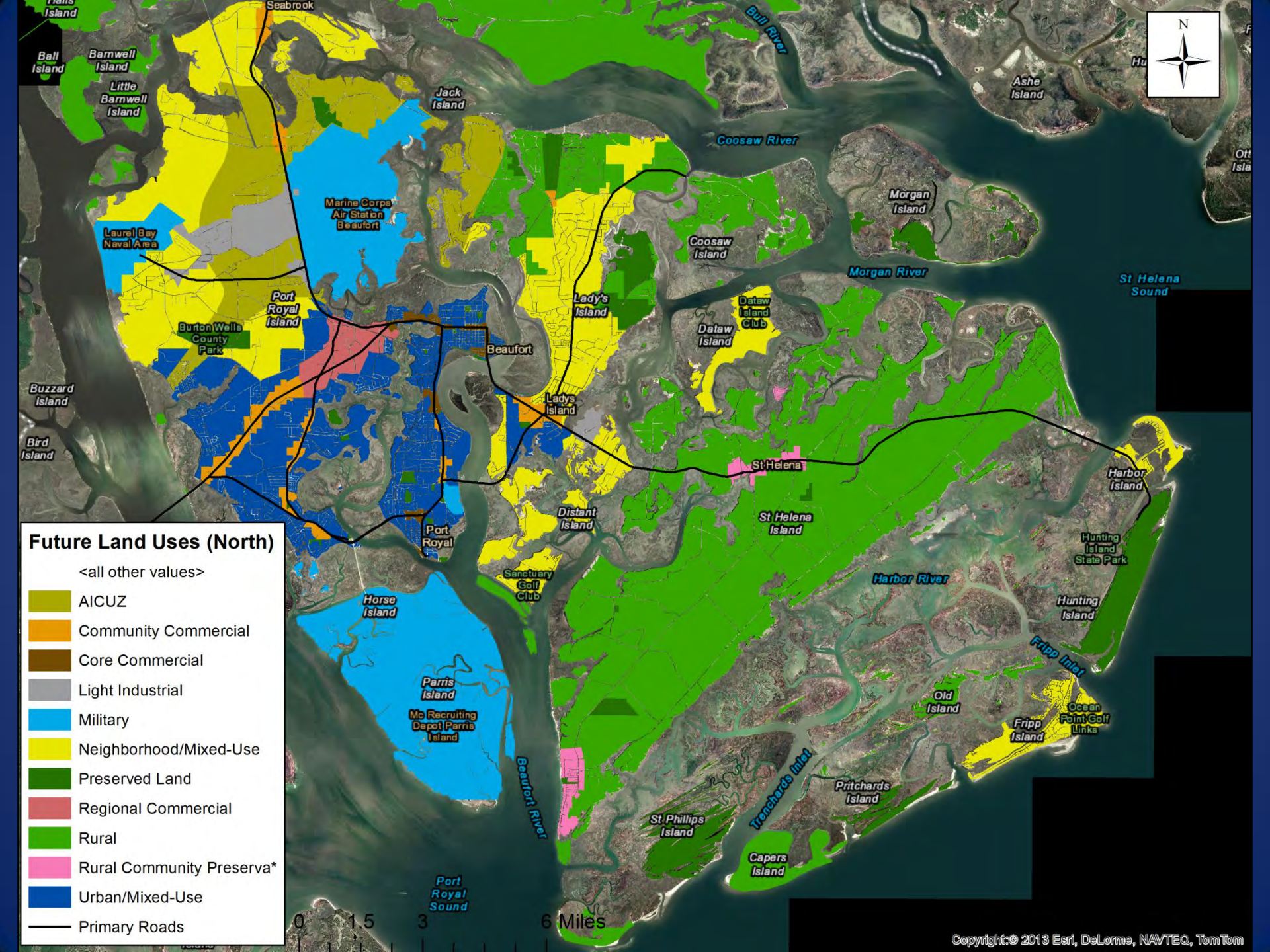
| Sea Level Rise Above MHHW | Facility Significantly Flooded |
|---|---|
| 1 ft. | N/A |
| 2 ft. | N/A |
| 3 ft. | Broad River Landing, Lady's Island Airport |
| 4 ft. | Crossings Park (HI), HI Fire Dept. Station 2*, LI/St.Hel. Fire Dept. Station 24* |

*Located on upland, but surrounding areas flooded.

Conclusion: County facilities are mostly in good shape!

# Future Land Use Areas




Future Land Uses (North)
<all other values>
AICUZ
Community Commercial
Core Commercial
Light Industrial
Military
Neighborhood/Mixed-Use
Preserved Land
Regional Commercial
Rural
Rural Community Preserva*
Urban/Mixed-Use
Primary Roads
0
1.5
3
6 Miles
N
Seabrook
Bull River
Ball Island
Barnwell Island
Little Barnwell Island
Jack Island
Ashe Island
Coosaw River
Marine Corps Air Station Beaufort
Laurel Bay Naval Area
Morgan Island
Coosaw Island
Morgan River
St Helena Sound
Port Royal Island
Lady's Island
Dataw Island Club
Dataw Island
Burton Wells County Park
Beaufort
Buzzard Island
Bird Island
Lady's Island
St Helena
Harbor Island
Distant Island
St Helena Island
Port Royal
Hunting Island State Park
Sanctuary Golf Club
Harbor River
Horse Island
Hunting Island
Fripp Inlet
Parris Island
Old Island
Mc Recruiting Depot Parris Island
Ocean Point Golf Links
Fripp Island
Beaufort River
Trenchards Inlet
Pritchards Island
St Phillips Island
Capers Island
Port Royal Sound
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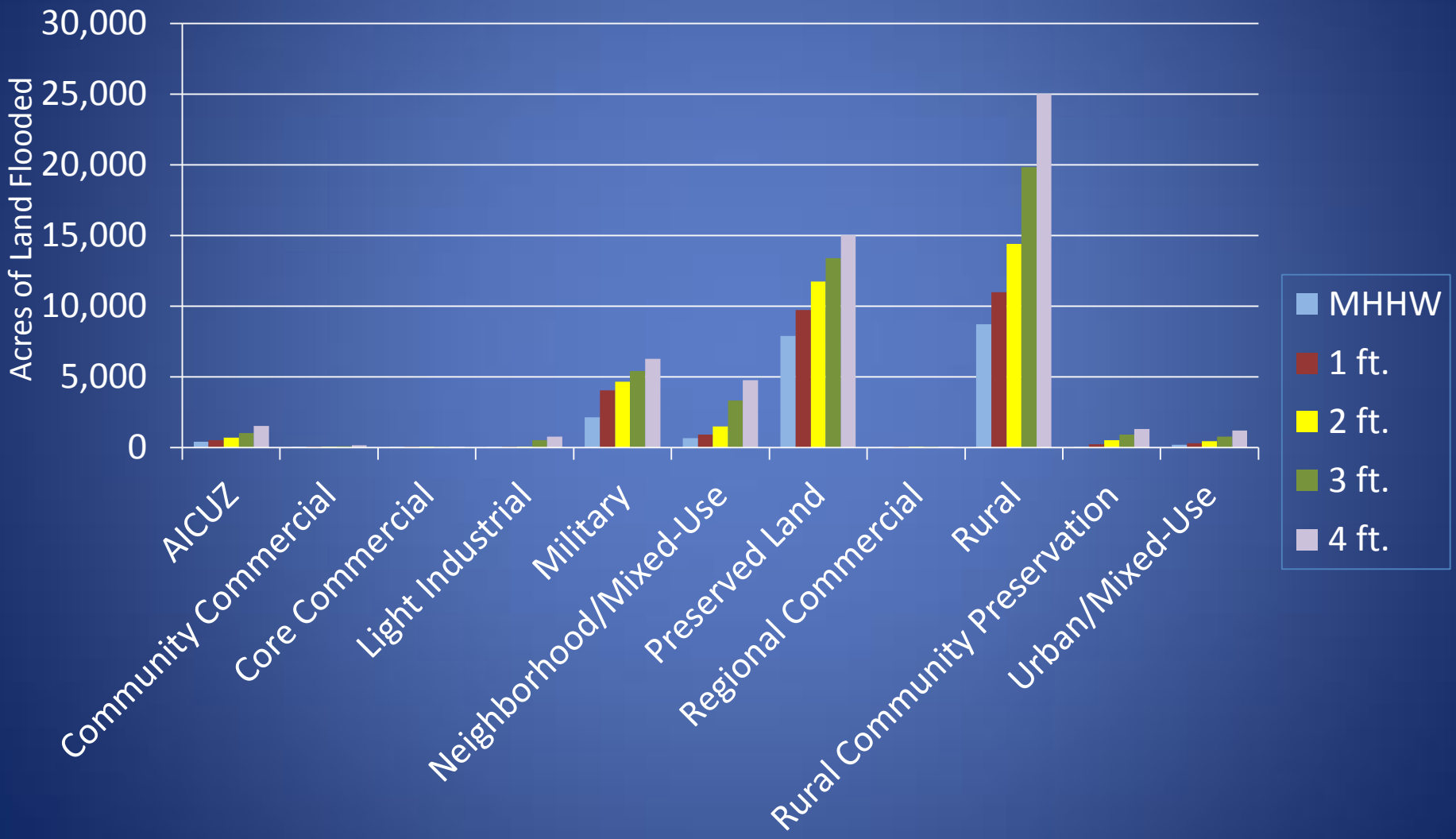
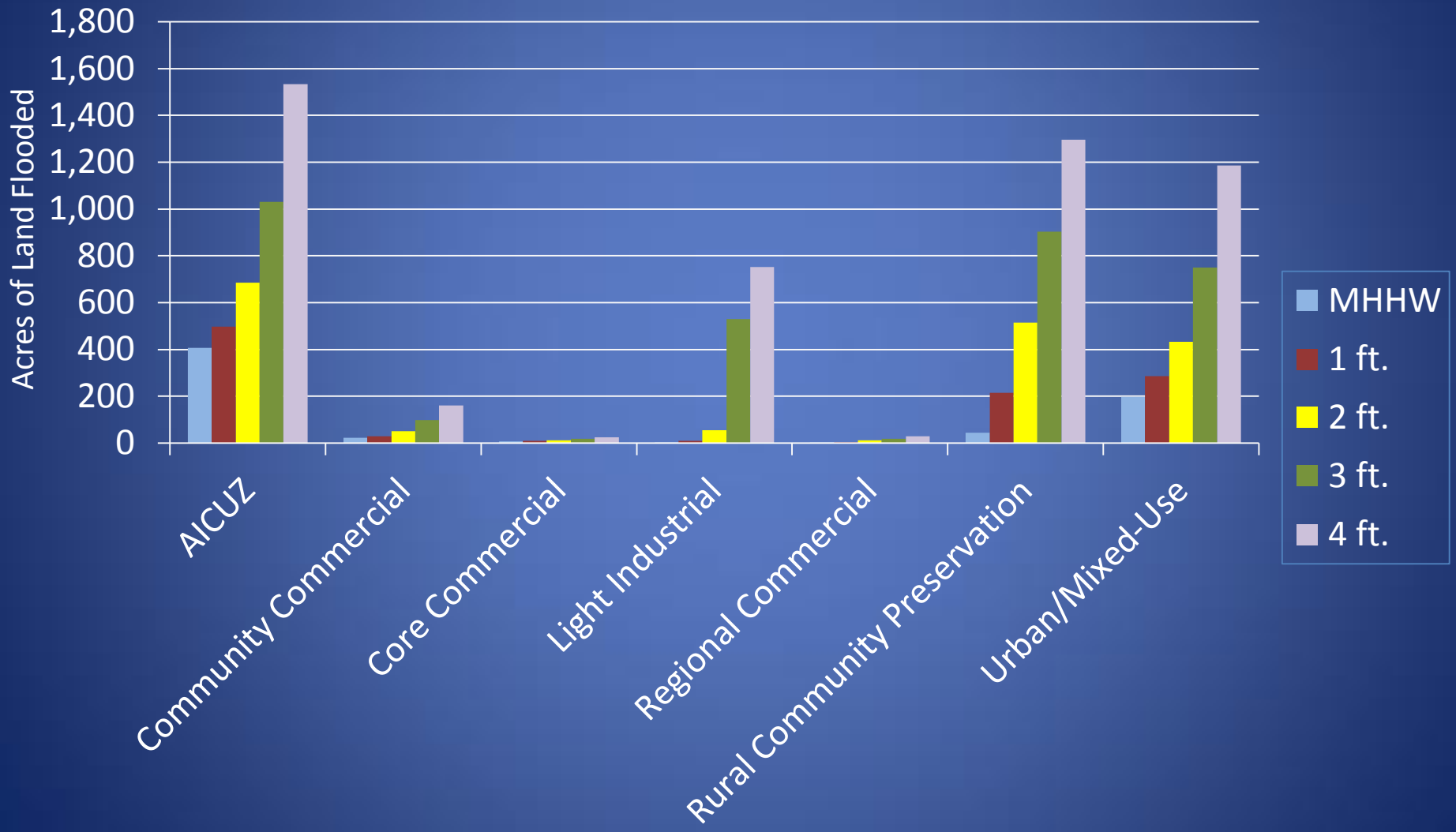
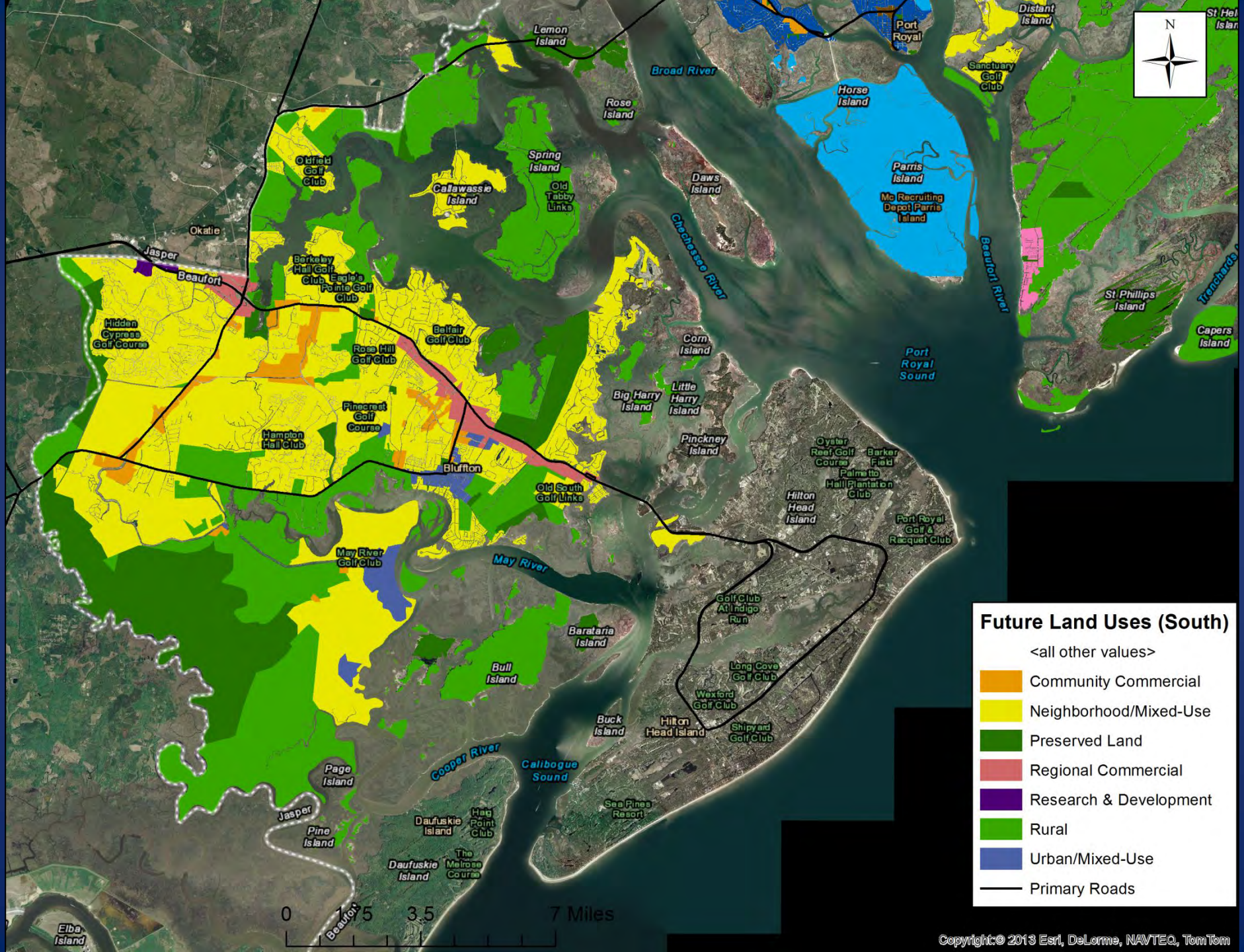
# Land Use Flooding (North)



# Selected Land Uses




Future Land Uses (South)
<all other values>
Community Commercial
Neighborhood/Mixed-Use
Preserved Land
Regional Commercial
Research & Development
Rural
Urban/Mixed-Use
Primary Roads
N
0
1.75
3.5
7 Miles
Lemon Island
Broad River
Port Royal
Distant Island
Sanctuary Golf Club
Horse Island
Rose Island
Spring Island
Oldfield Golf Club
Callawassie Island
Old Tabby Links
Daws Island
Parris Island
Mc Recruiting Depot Parris Island
Okatie
Jasper
Beaufort
Berkeley Hall Golf Club
Eagle's Pointe Golf Club
Chechessee River
Beaufort River
St Phillips Island
Capers Island
Hidden Cypress Golf Course
Belfair Golf Club
Rose Hill Golf Club
Corn Island
Port Royal Sound
Big Harry Island
Little Harry Island
Pinecrest Golf Course
Hampton Hall Club
Pinckney Island
Oyster Reef Golf Course
Barker Field
Palmetto Hall Plantation Club
Bluffton
Old South Golf Links
Hilton Head Island
Port Royal Golf & Racquet Club
May River Golf Club
May River
Golf Club At Indigo Run
Barataria Island
Bull Island
Long Cove Golf Club
Wexford Golf Club
Buck Island
Hilton Head Island
Shipyard Golf Club
Gooper River
Calibogue Sound
Page Island
Jasper
Pine Island
Daufuskie Island
Haig Point Club
Daufuskie Island
The Melrose Course
Sea Pines Resort
Elba Island
Beaufort
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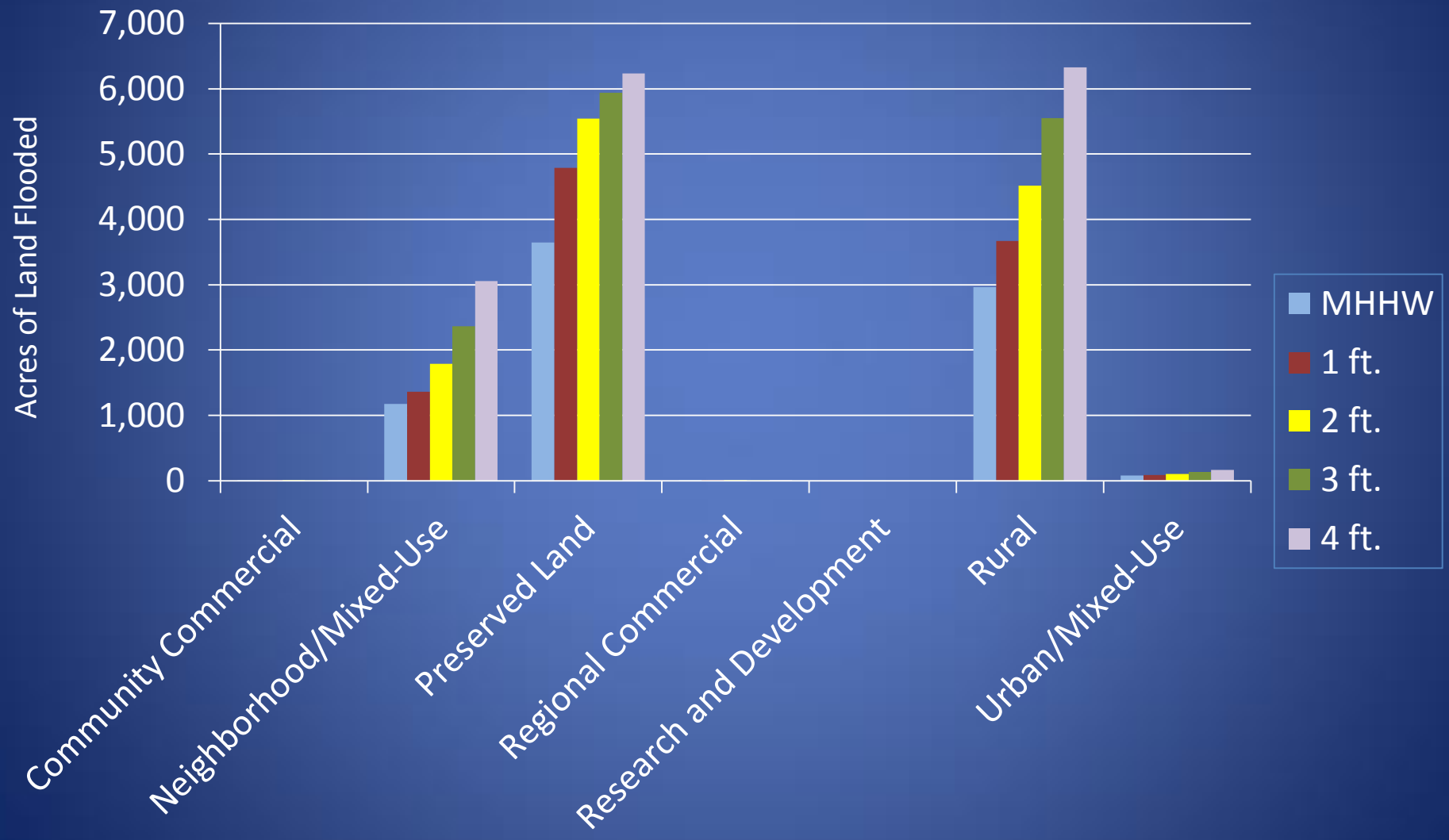
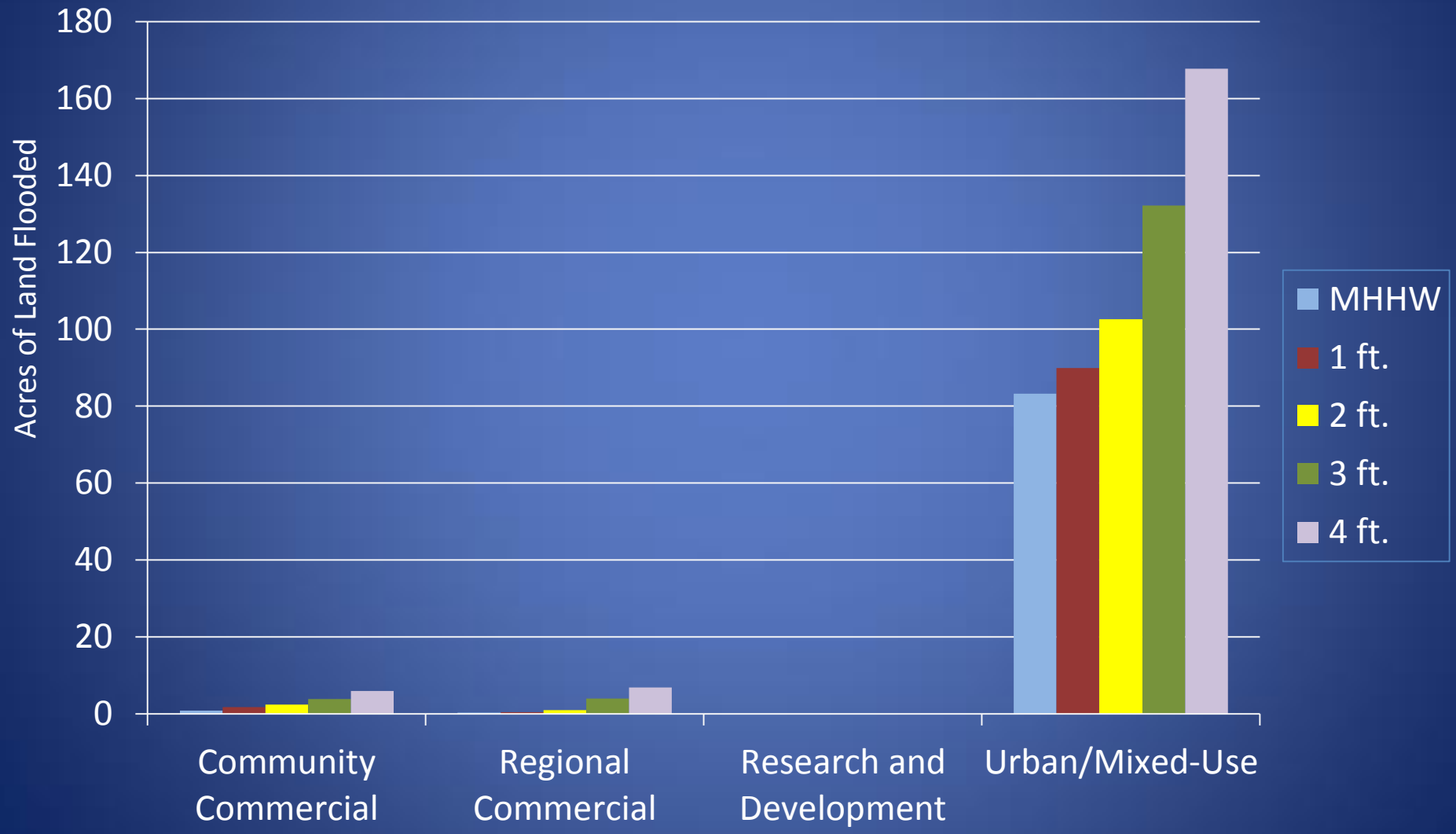
# Land Use Flooding (South)



# Selected Land Uses

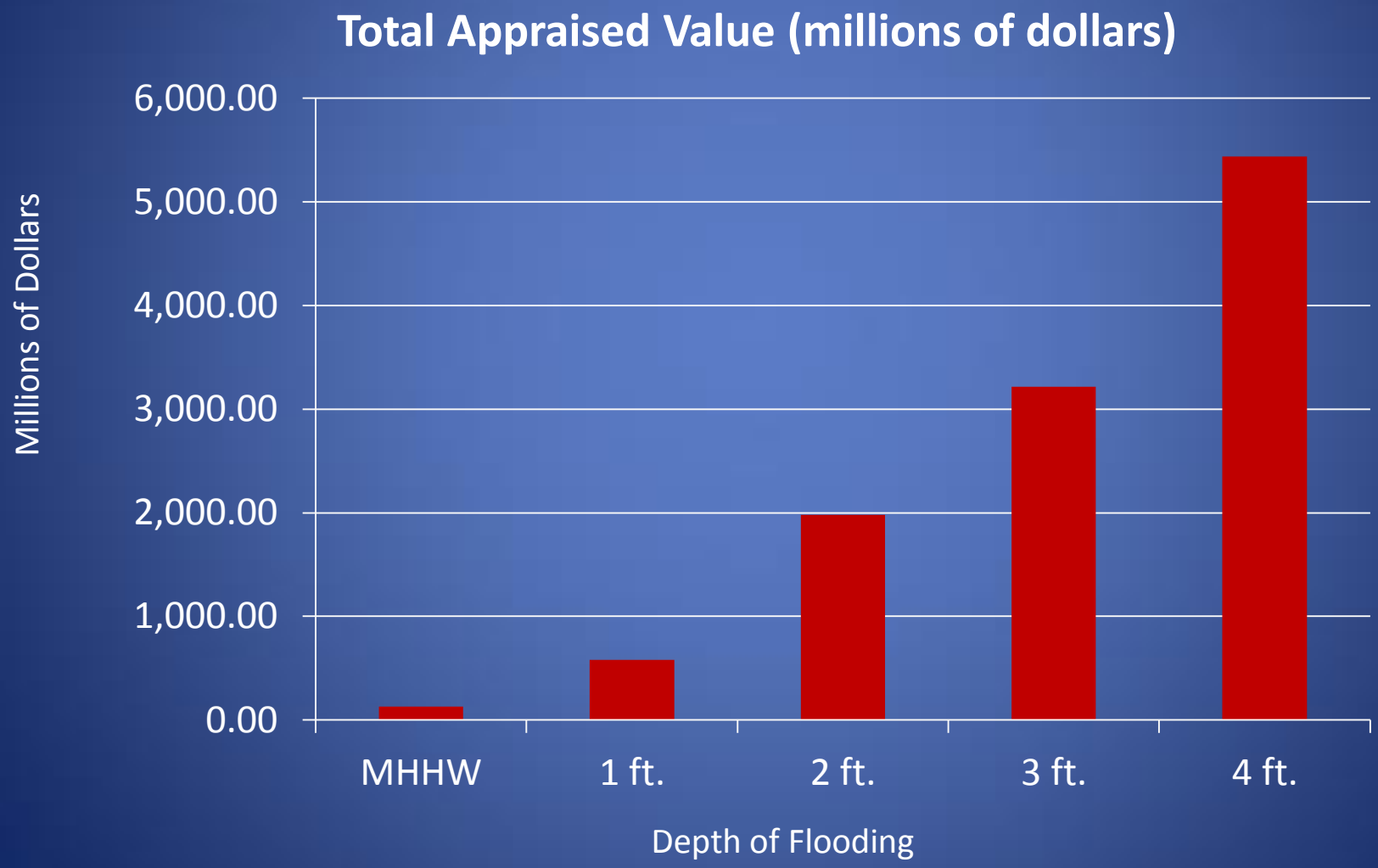


# Impact on Property

| Sea Level | Acres Flooded | Parcels Completely Flooded | Total Appraised Value* | Mean Parcel Value |
|---|---|---|---|---|
| MHHW | 3036 | 194 | $129,320,900 | $910,711 |
| 1 ft. | 6649 | 280 | $577,883,400 | $2,320,817 |
| 2 ft. | 13356 | 538 | $1,980,219,700 | $3,300,366 |
| 3 ft. | 19926 | 1392 | $3,218,551,500 | $1,676,329 |
| 4 ft. | 34508 | 3187 | $5,438,507,600 | $919,910 |

*This number represents the sum of the appraised values of all parcels completely flooded at the designated sea level.

# Property Value of Parcels Flooded



# Marshes

- Marsh grows at specific elevations within the intertidal zone.
- Marsh will follow the movement of the intertidal zone onto former upland.
- Depending on the rate of accretion, sediment can bolster the elevation of marshland as seas rise.

http://csc.noaa.gov/slr/viewer/

# Works Cited

Parris, A., P. Bromirski, V. Burkett, D. Cayan, M. Culver, J. Hall, R. Horton, K. Knuuti, R. Moss, J. Obeysekera, A. Sallenger, and J. Weiss. 2012. Global Sea Level Rise Scenarios for the US National Climate Assessment. NOAA Tech Memo OAR CPO-1. 37 pp

Church, J.A., P.U. Clark, A. Cazenave, J.M. Gregory, S. Jevrejeva, G.A. Merrifield, G.A. Milne, et al. 2013. "Sea Level Change." In *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK and New York, NY: Cambridge University Press.