WTNA update, May 16, 2022

Dale Morris, Chief Resilience Officer, City of Charleston

- 3x3x3 (USACE Surge Structure)
- Spring-Fishburne Drainage
- King-Huger Drainage
- Low Battery Rehabilitation
- Community Flood Resilience Support System (pilot)
- Comprehensive, Integrated Water Plan

NOAA Category 3 Storm Surge

Virtually all of the Peninsula is within the NOAA max category 3 storm surge, with the exception of Laurel Island.

map sources: NOAA

Legend

Cat 3 Max Storm Surge (Above Ground)

- <5 ft
- 5-10 ft
- 10-15 ft
- >15 ft

Watersheds Neighborhood

Project Watersheds

Project Subwatersheds

Urban Growth Boundary

Water

Water

1 inch = 4,000 feet

Miles 1

76

Vulnerability Analysis: Surge

- **Residential**: 99% of Peninsula residential properties at risk from surge.
- **Business:** 98% of Peninsula commercial properties at risk from storm surge.
- **Infrastructure:** 100% of critical Peninsula roads inaccessible during surge event.
- **Critical Facilities**: 90% of critical facilities vulnerable (CMD, colleges / universities). +50% of fire and police stations.
- **Economy and Medical Provisioning:** 47k tourism jobs, 20k Charleston Medical District jobs and 4 hospitals at risk

NED plan: $1.1b, 10.8 BCR

- 8 mile long surge structure, 12ft NAVD 88 around peninsula
- T-Wall, Combo Wall, Nonstructural
- 10 Pumps (overtopping / impoundment)
- 85 closure structures
- 3 nonstructural areas (2 EJ)

- Living Shorelines (after EIS) added, but reclassified to only mitigation
- NNBFs Newmarket Creek, Halsey, Wagener Terrace – screened out in feasibility
- Alignment
- Realignment: Port Terminals

- Discovery Analysis
- City Design Division
- Design Agreement / PED goals

- **“Lowest Cost, Highest Value”**

Dale Morris
Chief Resilience Officer
Charleston, SC

National Academies of Science, Engineering and Medicine

Workshop on Nature-Based Features and Policy Deficiencies
May 10-11, 2022

- "The overarching need before us is to figure out how to discover, preserve, expand, and apply nature's value." US Army Corps of Engineers. Engineering with Nature, An Atlas, Volume 2, 2021.

Spring Fishburne Drainage

- $240m project
- 2008 - 2024
- Phase 4 nearing completion (wet well, gravity to river)
- Ehrhardt Tunnel and Drop Shaft (CMD)
- Phase 5 (pump station build), under contract, completion 2024.

- **https://black-and-veatch-om.herokuapp.com/**

King Huger (sub basin and pump)

- Increasing water storage capacity (above and below) in the area
- Upsizing select existing conveyance systems
- Pump station building a pump station to handle flow from significant storm events.

- Phase 1 – conveyance and storage – complete

- Phase 2: pump station in TRC / BAR

Low Battery Rehabilitation (2015 – 2024)

- Repair, rehabilitate and increase height of Low Battery
- Broader walkway, underground utilities, replace structure foundation
- 4 Phases. Phase 3 just started.
- +/- $64m

- https://www.charleston-sc.gov/1193/Low-Battery-Seawall-Repair

- **Storymap:** https://storymaps.arcgis.com/stories/bc6e1790933b4c018a52dca8c1daec6a

Community Flood Resilience Support System (tool)

Pilot Project, 2021 – 2022.

- US Dept of Homeland Security, Science and Technology Directorate
- FEMA
- Deltares
- City of Charleston

- SFINCS (Super-Fast Inundation of Coasts model)
- Delft-FIAT (Flood Impact Assessment Tool)

- Planning / Education / Scenarios

- Eventual deployment to other US communities.

- "…a community-oriented, flood-hazard modeling and impact assessment decision support tool using **open-source data, models and software…that can help communities make more informed decisions around flood risks and climate mitigations**. CFRSS models flooding and damages caused by the combined effects of tides, storm surges, inundating precipitation, and river discharge to enhance understanding and the ability to **address vulnerability to compound events**."

- https://www.dhs.gov/science-and-technology/news/2022/01/06/feature-article-building-community-climate-resilience-compound-flood-modeling-tools

Water depth	Damages
0 - 1 ft.	No damage
1 - 3 ft.	<$20K
3 - 5 ft.	$20K - $60K
> 5 ft.	$60K - $150K
	$150K - $400K
	>$400K

2021

2050

(NOAA intermediate projection)

KING TIDE WITH SEA LEVEL RISE – SOUTH WINDERMERE

Water depth

- 0 - 1 ft.
- 1 - 3 ft.
- 3 - 5 ft.
- > 5 ft.

Damages

- No damage
- <$20K
- $20K - $60K
- $60K - $150K
- $150K - $400K
- >$400K

12-FOOT WATER LEVEL (+NAVD88)

Water depth
- 0 - 1 ft.
- 1 - 3 ft.
- 3 - 5 ft.
- > 5 ft.

Before measure

Damages
- No damage
- <$20K
- $20K - $60K
- $60K - $150K
- $150K - $400K
- >$400K

After measure

12-FOOT WATER LEVEL (+NAVD88)

Comprehensive, Integrated Water Plan

- City Procurement 22-P009R, Closed May 5, 2022
- Proposals under review. Project Start Q3 2022, Project Completion +/- Q4 2023.
- “The City of Charleston is seeking a qualified architecture, landscape architecture, engineering and design firm or team to support the City’s key **near- and long-term water management, protection and adaptation** work through the development of a Comprehensive, Integrated Water Plan (Water Plan) for the City of Charleston. The Water Plan will aid City staff, City Council, stakeholders and citizens to **understand, plan for, prioritize, manage and adapt to current and future flood risks across all City neighborhoods, main drainage basins and floodplains.**”