



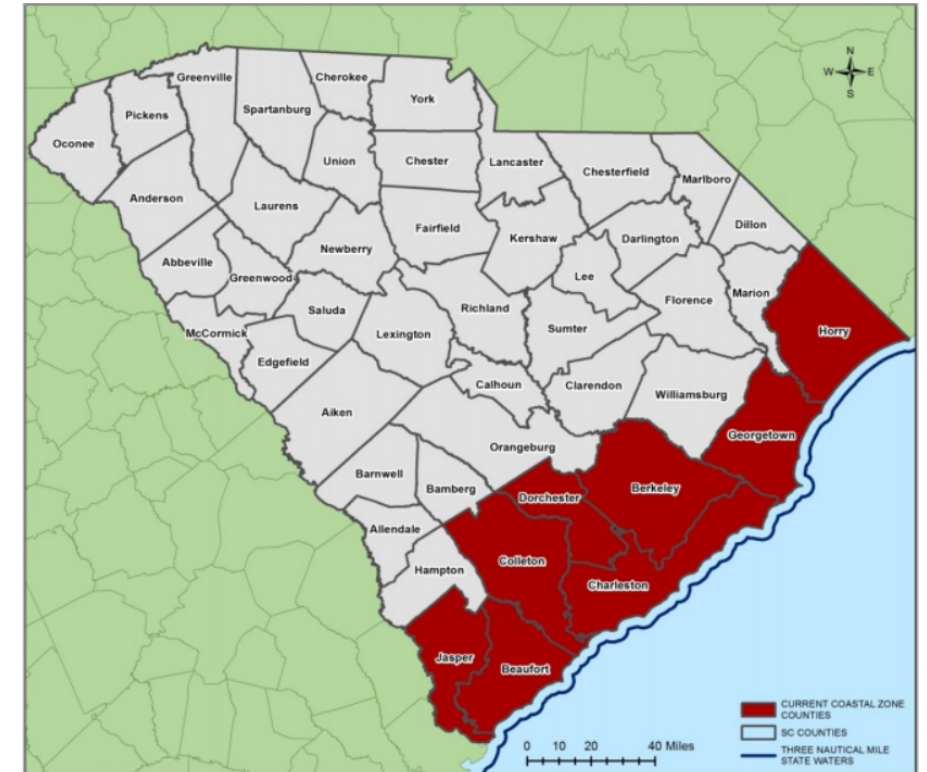
# Charleston Resilience Network

Dan Burger  
Director, Coastal Services Division, DHEC-OCRM  
Chair, Charleston Resilience Network



# SC Coastal Zone Management Program

- Eight (8) Coastal Counties
- Regulatory Program
- Planning, Policy and Technical Assistance
- Goal: Protect the quality of the coastal environment and to promote the economic and social improvement of the coastal zone and of all the people of the state.  
(S.C. Code of Laws 48-39-30)





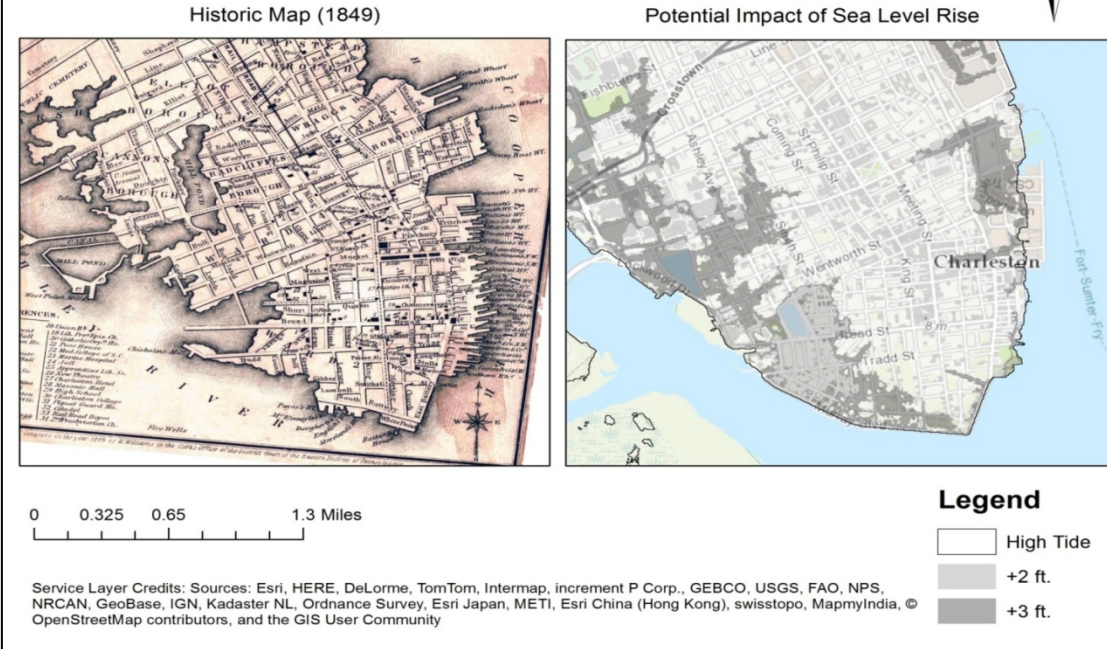
# Charleston, SC



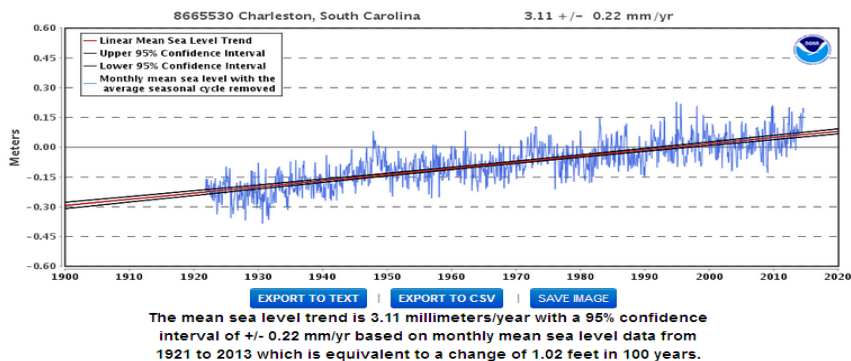
Photo: V. Kaufman

- Increasingly Diverse Economy (Tourism, Port, Tech, Manufacturing)
- Historic Character...and Infrastructure
- Significant Population Increase
- Rapidly Changing Landscape and Environment
- Altered Hydrology
- Loss of Regional Ecosystem Services

### Sea Level Rise and Artificial Fill in Charleston, SC



### Mean Sea Level Trend 8665530 Charleston, South Carolina



Six

### Top ~~5~~ Water Levels in Charleston Harbor

Event and Date	Water Level
Hurricane Hugo (4) on 09 Sept. 1989	12.52 ft MLLW
Unnamed Storm (2) on 11 Aug. 1940	10.23 ft MLLW
Tropical Storm Irma on 11 Sept. 2017	9.92 ft MLLW
Hurricane Matthew (1) on 08 Oct. 2016	9.28 ft MLLW
Unnamed Storm on 01 Jan. 1987	8.81 ft MLLW
October 2015	8.65 ft MLLW





South Carolina Department of Health and Environmental Control  
Healthy People. Healthy Communities.

# What <sup>DOES</sup> will^ this look like?



 MyCoast



Photos : S.C. DHEC MyCoast: N. Carey, L. Fly, T. Mitchum

Learn more: [mycoast.org/sc](http://mycoast.org/sc)



# In the News...Why Resilience Matters

The sea level did, in fact, rise faster in the Southeast US

- [New York Times, 09 Aug 2017](#)

Report: Charleston may flood almost every day at high tide by 2100

- [Post and Courier, 10 Aug. 2017](#)

Downtown Charleston broke record for flooded days last year; Rain, floods continue to swamp Lowcountry

- [Post and Courier, 7 June 2017](#)

Rising seas threaten nearly \$1 trillion worth of US homes, and most of them are moderately priced

- [CNBC, 18 October 2017](#)

Erosion from TS Irma at Folly Beach worse than Hurricane Matthew

- [Post and Courier, 12 September 2017](#)

Beaches erode as tides encroach on Charleston

- [The State, 11 September 2017](#)

Charleston floodwaters are crawling with unsafe levels of poop bacteria

- [Post and Courier, 14 June 2018](#)

NOAA: Coastal communities saw record number of high tide flooding days last year

- [06 June 2018](#)

Charleston Preparing \$100M Project to fight sea level rise

- [U.S. News and Word Report, 15 July 2017](#)

Tropical Storm Irma's waves inundate Edisto, leaving town surrounded by water

- [Post and Courier, 11 September 2017](#)

A tropical storm surge sends Charleston an urgent message: Here's your future

- [Post and Courier, 17 September 2017](#)

It's official: Charleston is now S.C.'s largest City

- [Post and Courier, 25 May 2017](#)

High-tide flooding in the U.S. is twice what it was 30 years ago,

- [CBS News, 06 June 2018](#)



# U.S. DHS Table Top Exercise

## Key Findings for Charleston, SC (2014)

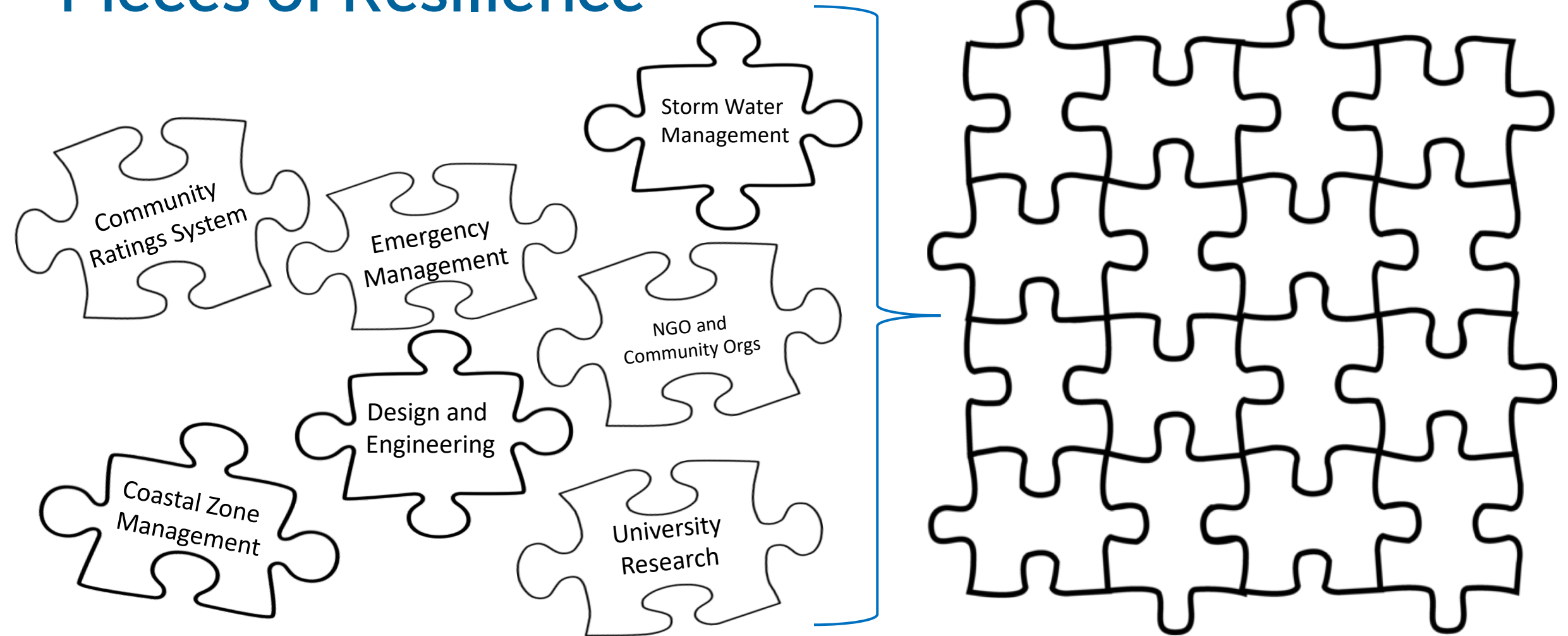
### Climate Hazard Analysis

- Hot summers with little relief in temperatures
- Increase in coastal flooding extent, frequency and duration in tidal conditions
- Increase in storm surge inundation
- Increase in frequency of heavy rainfall events

### TTX Exercise

- “Climate adaptation planning needs to be driven more consistently at the **local level**, where most of the impacts will occur.”
- “Continued **education and outreach efforts** are needed to ensure **uniform knowledge** of how climate hazards impact critical infrastructure over the long term.”

# Pieces of Resilience





# Why Collaborate for Resilience?

- Consistency in data sources
- Identify data gaps and programmatic opportunities
- Align strategies to gain efficiency, avoid duplication and reach broader audience
- Develop message and deliver effectively via trusted messengers
- No single organization or sector has the capacity, responsibility or mandate



The **Charleston Resilience Network** (CRN) is a voluntary collaboration of public, private and non-profit sector stakeholder organizations within the Charleston, S.C. metropolitan area that have a collective interest in the resilience of communities, critical infrastructure and socio-economic continuity to episodic natural disasters and chronic coastal hazards.

\*\*\*

The **Charleston Resilience Network** will work to foster a unified strategy and provide a forum to share science-based information, educate stakeholders and enhance long-term planning decisions that result in resilience.

\*\*\*

[CharlestonResilience.Net](http://CharlestonResilience.Net)





# Resilience is...

*the capacity of individuals, communities, institutions, businesses, and systems within the Charleston region to survive, adapt and grow despite episodic natural disasters and chronic coastal hazards.*



South Carolina Department of Health and Environmental Control  
Healthy People. **Healthy Communities.**

# A coalition of the willing...



## Advisory







South Carolina Department of Health and Environmental Control  
Healthy People. Healthy Communities.

Wells Fargo Surculus Whole Building Systems The Nature Conservancy

Atlantic Business Continuity Services The Citadel Novus Architects

Robinson Design Engineers Palmetto Project Trident United Way Charleston AIA

Lowcountry Alliance for Model Communities South Carolina Sea Grant Consortium

# Charleston Resilience Network

S.C. DHEC Ocean and Coastal Resource Management Urban Land Institute

College of Charleston SCANA Charleston Water System South Carolina Aquarium Thomas & Hutton

Coastal Conservation League Town of Mt. Pleasant Charleston County SC Emergency Management Division SC Coastal Information

Network Roper St. Francis Hospital Joseph P. Riley Center for Livable Communities DHS Infrastructure Protection

Amec Foster Wheeler League of Women Voters Davis & Floyd Engineering City of Charleston Terracon

Medical University of South Carolina Carolinas Integrated Sciences and Assessments Town of Kiawah Island Verizon

City of North Charleston Berkeley-Charleston-Dorchester Council of Governments Charleston Metro Chamber of Commerce

SC Hospital Association National Academy of Sciences Small Business Chamber of Commerce LS3P Enough Pie EPRI

ISET International Kimley-Horn Radium Architecture University of South Carolina SC Audubon Southern Environmental Law Center

Biohabitats NOAA Carolinas Integrated Sciences and Assessments SC Dept. of Natural Resources

Lowcountry Open Land Trust Charleston Good East Cooper Land Trust

Adair Risk Management Resource Environmental Solutions

SKA Consulting NRCDCity of Folly Beach

US Army Corps of Engineers

# CRN Initiatives

- NOAA Coastal Resilience Grant
  - Parcel-level vulnerability mapping and community engagement
- DHS National Infrastructure Protection Plan
  - Tools assessment, focus groups, distillation and tool creation
- National Academy of Sciences
  - Social vulnerability survey with Z. Zurich Foundation and community engagement
- Support of City of Charleston SLR Strategy
  - Knowledge Exchange
  - Living with Water/Dutch Dialogue
- Integration of experts into comp plans, SLR strategies, hazard mitigation plans, etc.
- STEM and STEAM
- Facilitator and Match-Maker

# DHEC Coastal Zone 5-Year Strategies

- Alignment of Local Comprehensive Beach Management Plans with NFIP Community Ratings System (CRS)
  - Working Group
  - Development of decision support tools
- Development of success criteria and guidance for Living Shorelines
  - Working Group
  - S.C. DNR and NERR Science Collaborative to examine site selection, materials, installation techniques, etc.



# Recognizing the Challenges

- Changes in policy, regulation and practice lag behind realized social, economic and environmental impacts
- SLR will continue to exacerbate the effects of King Tides, extreme precipitation and storm surge flooding
- Infrastructure and capital projects are expensive
- Increase in population density and land use conversion; loss of ecosystem service
- Doing nothing or not enough risks tremendous social and economic consequences

# Recognizing the Opportunities

- Effective solutions will require public and private innovation and collaboration
- Resilience will enhance coastal communities' ability to attract and retain diverse economic engines
- Resilience builds and protects value, regional identity and resources
- Resilient design reduces property risk and disruptions to mobility, supply chain, etc.
- Living with Water approach has the potential to reduce cost, enhance protection and preserve ecological function



## Contact Us

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## Stay Connected

