TOWN OF SWANSBORO
PLANNING BOARD
SPECIAL MEETING AGENDA

March 15, 2021
Monday, 5:30 PM

*** Special Meeting Zoom Link:** https://us02web.zoom.us/j/88605579732

1. **Call to Order**

2. **Business**
   - **A. Tax Valuation Discussion**
     Kevin Turner, Appraisal Supervisor with Onslow County Tax Administration will be available to review and discuss the process for tax valuation related to wetlands/marsh on properties.

     Action Needed: Review and discussion

   - **B. Residential Cluster Development Regulations**
     At the March 2, 2020 regular meeting, the Board discussed their immediate goals with regard to implementation of the Land Use Plan. The first priority established was to re-work the Residential Cluster Development Regulations to strengthen the requirements for the protection of vulnerable areas such as designated wetlands and the floodway.

     Action Needed: Review and discussion on the proposed amendments to the Residential Cluster Development Regulations.

3. **Chairman/Board Thoughts/Staff Comments**

4. **Adjournment**

Planning Board
Agenda Item Submittal

Item to Be Considered: **Residential Cluster Development Regulations**

Board Meeting Date: **March 15, 2021**

Prepared By: **Jennifer Ansell, Planner**

Overview: At the March 2, 2020 regular meeting, the Board discussed their immediate goals with regard to implementation of the Land Use Plan. The first priority established was to re-work the Residential Cluster Development Regulations to strengthen the requirements for the protection of vulnerable areas such as designated wetlands and the floodway.

Action Needed: Review and discussion on the proposed amendments to the Residential Cluster Development Regulations.

Attachments
Residential Cluster Development Regulations and Proposed Amendments
CAMA Land Use Plan Goals/FLUM/Conservation Priority Areas/Implementation/VCAPS

RESIDENTIAL CLUSTER DEVELOPMENT REGULATIONS

§ 152.225 PURPOSE AND INTENT; DEFINITION.

(A) The purpose of residential cluster development is to provide an alternative development option that will:

1) Promote more efficient use of land resources than is otherwise possible under conventional zoning and subdivision regulations;
2) Reduce the per unit site development costs of dwellings by concentrating residential units on a portion of the site without increasing the overall net density above that which would normally be allowed pursuant to §§ 152.195 through 152.196, Table of Area, Yard , and Height Requirements;
3) Preserve the natural character of the site;
4) Preserve farmland and scenic views;
5) Provide for desirable and usable open space, tree cover, and the preservation of environmentally sensitive areas; and
6) Provide variety in residential buildings and properties and provide design flexibility that can relate the location of units to unique site conditions.

(B) For the purposes of this section, a ***RESIDENTIAL CLUSTER DEVELOPMENT*** is defined as:

1) A development design wherein conventional zoning standards are relaxed to permit modifications in lot area , lot width , lot frontage , lot coverage , required yards , and public street access, and to save infrastructure development cost, environmental damage, energy use and land resources by concentrating dwellings in specific areas of the site without increasing the net density above that which would normally be allowed pursuant to §§ 152.195 through 152.196, Table of Area, Yard , and Height Requirements;
2) Such development shall contain detached single-family dwellings only; and
3) Such development shall provide a program for the provision, operation and maintenance of such areas, facilities and improvements as shall be required for the perpetual common use by the occupants of the development.

§ 152.226 AREA; PERMITTED DISTRICTS, EXEMPTION; STREET ACCESS; OPEN SPACE(S); DENSITY; DIMENSIONAL STANDARDS.

(A) Residential cluster developments shall contain not less than five net acres. For purposes of this section “net acres” shall be the total area of all lots and common area(s) exclusive of public street rights-of-way or private street easements. Addition to any existing residential cluster development may be allowed provided such addition meets or exceeds all other applicable requirements.

(B) Subject to division (A) of this section, a residential cluster development may as an option be allowed within any residential zoning district. Such development shall be exempt from the conventional zoning standards relative to lot area, lot width, lot frontage, lot coverage , required yards and public street access normally applicable to such districts, provided such development complies with the minimum standards set forth under this section.

(C) Dwelling units within a residential cluster development may be constructed on lots fronting private streets.

(D) A residential cluster development shall provide open space (s) subject to all the following requirements:

1) Such open space shall be greater or equal in area to the total amount of area by which each lot was reduced below the minimum lot size requirement of the prevailing zoning district, or as provided under division (D)(2) of this section, whichever is greater;
2) Residential cluster developments shall reserve not less than 15% of the gross acreage as common open space;
3) Such area shall not be used as a building site. For purposes of this section, picnic areas or shelters, ball fields, walking or jogging trails, boat ramps and docks or other similar recreational facilities may be allowed;
4) Such area shall not be devoted to any public street right-of-way or private street easement, private driveway or parking area ;
5) Such area shall be left in its natural or undisturbed state if wooded at the time of development, except for the cutting of trails for walking or jogging or, if not wooded at the time of development, is improved for the uses listed under division (D)(3) of this section, or is properly vegetated and landscaped with the objectives of creating a wooded area or other area that is consistent with the objective set forth in division (D)(6) of this section;
6) Such area shall be capable of being used and enjoyed for purposes of informal and unstructured recreation and relaxation or for horticulture if not devoted to other allowable uses in this division;
7) Such area shall be legally and practically accessible to the residents of the development, or to the public if so dedicated;
8) A minimum of one-half of the required open space shall be contained in one continuous undivided part;
9) ~~Not more than 25%~~ None of the required open space shall lie within an area identified as either 401 or 404 wetlands or ~~of the required open space shall lie~~ within any floodway zone;
10) Not more than 25% of the required open space may be devoted to allowable improvements as set forth in division (D)(3) of this section;
11) Such area shall be perpetually owned and maintained for the purposes of this article by a homeowners association or, at the option of the town, dedicated or deeded to the public.
12) The location and arrangement of any open space (s) shall be subject to Planning Board approval during the Preliminary Plat review;
13) The owner shall, pursuant to the subdivision regulations, cause a final subdivision plat to be recorded in the Onslow County Register of Deeds which clearly describes the open space (s) and conditions thereof, prior to the issuance of any building permit(s).
14) These requirements are in addition to those found under Section 152.367, Parks and Recreation Space Requirements, of the Subdivision Ordinance.

(E) Areas identified on the Preliminary Plat as 401 wetlands, 404 wetlands, floodway, or if located within 30 feet of the normal water level along a coastal shoreline shall be reserved and dedicated to the Town in the form of a conservation easement. This designation shall be recorded on the face of the Preliminary and Final Plats and a deed recorded conveying the area to the Town for preservation. No structure, impervious surface or other development shall occur in this area other than that which is permitted by the State or other regulatory agency.

§ 152.227 MAXIMUM DENSITY REQUIREMENTS.

(A) Residential density shall not exceed that which would normally be permitted under single-family standards within the prevailing zoning district on a net area basis.

(B) Public street rights-of-way and private street easements shall not be included or count towards the total net area for purposes of calculating allowable density.

(C) Area dedicated or deeded to the town pursuant to the sections above shall count towards net area for purposes of density calculation.

PLANNING BOARD STATEMENT OF CONSISTENCY
Land Use Plan Implementation-Residential Cluster Development Regulations

During its March 15, 2020 special meeting, the Town of Swansboro Planning Board reviewed proposed amendments to the Unified Development Ordinance regarding the Residential Cluster Development Regulations.

The proposed changes are **consistent** with the current Comprehensive Plan, specifically the following sections of the 2019 CAMA Land Use Plan Update:

- Section 4, Goals and Objectives:
  3) Prioritize the Natural Environment that is key to Swansboro's quality of life; and
  6) Build community resilience in a changing environment.
- Section 5, Future Land Use Designations, Conservation priority Area (CPA)
- Section 6, Implementation:
  1) Public Access
  2) Natural Hazard Areas
  3) Water Quality

and have been recommended for **approval** by the Planning Board.

This statement reflects the recommendation of the Town of Swansboro Planning Board this the 15th day of March 2021.

_____
Vote

_____
Planning Board Chairperson

Goals & Objectives

4

Vision

The town's vision comes from the recently adopted (June 2018) Economic Development Strategic Plan, and states:

Swansboro, the quaint and friendly city by the sea, is recognized by visitors and residents as a gem of North Carolina's coast. All who know and appreciate Swansboro celebrate the town's relaxed waterfront lifestyle, abundance of thriving, family-friendly, locally-owned businesses, recreational opportunities, and a broad range of historic, arts, dining, and shopping opportunities. The town remains committed to preserving its heritage, environment, and small-town appeal.

Goals & Objectives

The goals and objectives were developed through extensive public outreach and input, and will be used to guide re-zonings and investment decisions. They will also be used to guide land use policy decisions in the town. Primary themes from all public outreach are summarized below.

1 Preserve and enhance Swansboro's charming coastal character

- Extend historic development aesthetic/ elements of downtown
- Establish architectural & aesthetic standards to preserve historic character
- Foster and improve the town's sense of place through balanced growth that can attract residents, visitors and business investment

2 Foster growth that sustains and enriches the community

- Encourage context sensitive residential development
- Ensure infrastructure and public services keep pace with growth
- Extend the coastal village design concept to key locations
- Manage multifamily development in locations that create a walkable, mixed use village and promote social interaction

3 Prioritize the natural environment that is key to Swansboro's quality of life

- Utilize conservation measures to protect wetlands, floodplains, environmentally sensitive areas and to enhance water quality
- Utilize conservation-oriented measures
- Encourage water-based recreation and tourism
- Maximize and clarify access to the waterfront
- Make a "place" for people that takes advantage of the unique location and natural assets
- Improve and protect the town's natural environment in order to attract new residents and maximize the town's economic development potential

4 Transform NC 24 into a welcoming thoroughfare to Swansboro and its historic downtown

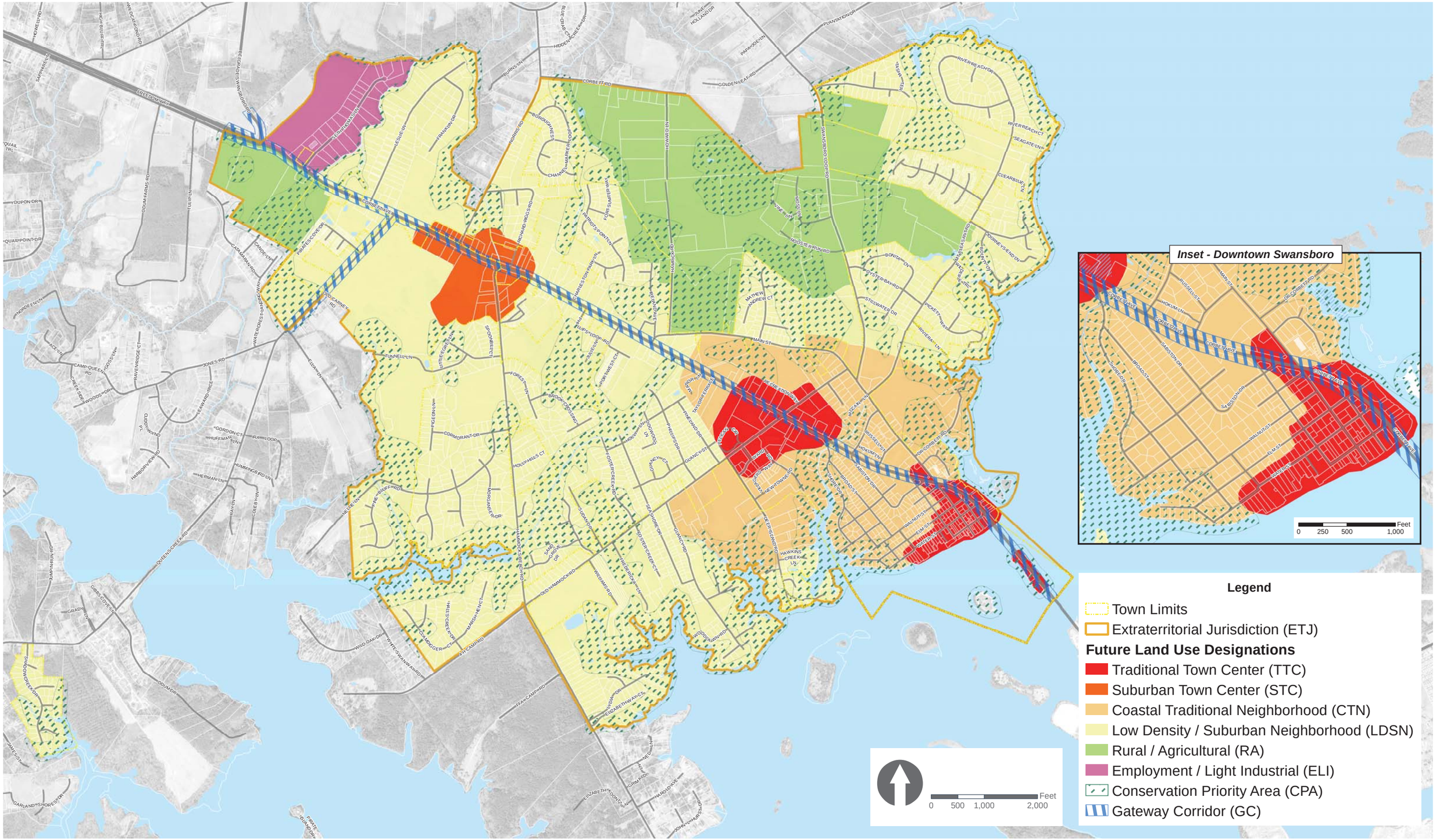
- Encourage mixed use development at nodes/key intersections; discourage additional strip development
- Promote placemaking and an attractive, cohesive development style along NC 24
- The gateway corridor should be designed as a tree-lined boulevard, with trees and other landscaping along the median and both sides of the road

5 Develop as a connected community

- Connect downtown to the north side on NC 24 and to the west
- Connect major destinations including parks, commercial centers, schools with safe sidewalks and off-road paths

6 Build community resilience in a changing environment

- Direct growth and public infrastructure investment to locations that are least likely to be affected by inundation, and where necessary manage the abandonment of imperiled infrastructure
- Accurately communicate risk and regulate high risk areas through enhanced development regulations
- Pursue projects that will increase resiliency to storms, flooding, and sea level rise



SWANSBORO CAMA LAND USE PLAN UPDATE

- Future Land Use Map -

Adopted: January 22, 2019

Date printed: 5/9/2019

Conservation Priority Area (CPA)

Conservation Priority Areas (CPA) represent opportunities to allow lower density development clustered away from and respectful of environmentally sensitive areas, important natural views, and priority conservation preservation areas as identified by the community. Agricultural preservation was also identified as a community priority, but where Rural Agricultural (RA) areas overlap the CPA, the development character and density restrictions of the RA area shall prevail, and not be further restricted by the CPA.

Character

Generally speaking, flood-prone areas (including 100-yr and 500-yr floodplains), all wetlands (coastal and upland), streams (perennial or "blue line" and intermittent), riparian areas and mature forests are priority preservation areas. This is especially true of areas that have an impact on water quality and accomodation of storm surge.

Development within this overlay should respect the natural environment that creates the quality of life that defines Swansboro. Clustering development away from sensitive environmental features or assets (views, habitat, etc.) is required. Deviations from typical lot standards may be necessary to accommodate clustering.

Coastal wetland

Agricultural field

Access and circulation

Streets will respect the underlying FLU designation, but may be designed with additional criteria that respect and enhance the natural environment. In particular, additional or enhanced flood mitigation, low impact design, or stormwater treatment measures may be necessary.

Setbacks

Setbacks should provide enhanced protection of environmental assets and provide additional buffering for structures or infrastructure that will be placed near CPAs. As such, setbacks will likely be determined by the underlying FLU(s) or zoning, but with additional setbacks from environmental features (stream, wetland, floodplain, open water body) that are within the CPA.

Massing and building heights

Modifications to the massing standards of the underlying FLU may be necessary to protect environmental resources and additional attention may be necessary to accommodate views of CPAs, which in some cases are considered a community asset.

Blocks

- Blocks are allowed as appropriate for the underlying FLU category, but larger blocks should be allowed if necessary to avoid environmentally sensitive areas.
- Stub-out connections should be located logically to facilitate future connections to adjacent areas, if environmentally feasible.

Parking

Parking areas should be designed to minimize stormwater generation or other negative externalities (i.e. - light pollution, runoff, etc.) that might impact CPAs.

Appropriate Density / Intensity

Low intensity development is allowed within this FLU designation at 50% of the gross density otherwise specified by the underlying FLU category. This means that less development will occur in or near the CPAs. All development that does occur must be clustered in the least environmentally sensitive part of the property and net density in that clustered, developed area may exceed the gross density for the total property, particularly if it is uplands.

Example of Conservation or Cluster subdivision. (Source: Chatham County Comprehensive Plan)

Example of Conservation Priority Area (CPA) with coastal wetlands.

Representative Areas

Currently, there are no representative areas in town that effectively demonstrate environmentally respectful cluster development.

Other Concerns

It is important to note maps within this plan depicting the CPA are for reference only, as these areas will naturally shift and realign, requiring field verification to determine exact location.

Lowering the intensity and density of development within this area in the town's jurisdiction may result in the demand for that development being displaced elsewhere, including to the area just outside the ETJ. If Onslow County has less restrictive regulations on development, it is likely this will result in additional higher intensity growth just outside of town, which could quickly consume farmland and land in environmentally-sensitive areas. This effect will likely be accelerated by availability of water and sewer services by the ONWASA. Consequenlty, the Town should coordinate with the County to implement a mutually-beneficial solution to this potential problem.

Implementation 6

Recommendations & strategies

Community plans are meant to be living documents. Priorities and directions are set in the plan, but implementation of the plan's recommendations and strategies will be carried out by Town leadership and staff. Swansboro embarked on the Land Use Plan update at the same time as other planning efforts, offering the opportunity for plans to be significantly aligned to each other, and enhancing the likelihood of successful implementation. The following recommendations and strategies are intended to provide additional guidance for implementing the goals and objectives of this plan.

Public access

Provide, enhance, and enforce public water access.

Waterfront access points should be clearly designated and designed as public spaces, without encroachment from neighboring property owners attempting to exert private influence over the area. Enhanced facilities (kayak and canoe launches, public benches or tables, trash cans, docks, etc.) also increase the appeal and use of these areas. When providing public access to waterfront areas, natural shoreline and habitat should be preserved as much as possible to protect water quality.

Protect views of the water and of natural areas and wetlands.

Preserve signature views and create new visual and/or physical connections to the water when accommodating new growth. Partner with land owners in existing development to increase connections to the shoreline.

Increase ADA accessibility and implement ADA Transition Plan.

The Americans with Disability Act (ADA) accessibility retrofits can be difficult to implement in older sections of town where space is limited. However, providing access, particularly to businesses and areas the general public is invited to visit, is important and should be the norm when evaluating upfits or redevelopment plans. The creation, adoption, and implementation of an ADA Transition Plan should also be a top priority.

Land use compatibility

Incorporate development standards that implement the character descriptions proposed in the future land use category descriptions.

The development character of certain parts of town are prized and must be measured and codified in the zoning code in order to see those changes occur in new development. A revision of the development standards and zoning regulations should be undertaken to see the character of the future land use designations carried forward into new development. For instance, parking minimums and maximums should be reviewed and revised to better implement the recommendations and goals of this plan.

Review development standards of the downtown and the historic neighborhoods surrounding downtown, and extend those standards to areas in the Traditional Town Center (TTC) and Coastal Traditional Neighborhood (CTN).

The people of Swansboro treasure the feel and character of the historic downtown and surrounding residential areas. This character should be quantified and codified so that future development and redevelopment can achieve a similar feel (setbacks, lot widths, parking location, materials, etc.), while also incorporating enhanced standards and performance (stormwater, pedestrian facilities, ADA access, etc.)

Continue to implement adopted town plans.

For plans to remain relevant and actionable, they must be acted upon, reviewed, and revised regularly, which may be as simple as a regular status update from staff on accomplishments and status of projects within each plan. Aging plans should be reviewed and revised to remain relevant, and a progress update schedule developed for each relevant plan with associated responsible town department.

Continue implementation of the adopted town plans, including but not limited to:

- Economic Development Strategy (2018)
- Parks & Recreation Master Plan (2019)
- Watershed Restoration Plan (2017)

Create zoning standards and strategies to address development in and near Rural Agricultural (RA).

Farming is a largely industrial activity that can create significant nuisances for adjacent residential properties. However residential development will seek to locate on dry, flat areas, most of which have previously been or adjacent to farmland. Enhance zoning standards for rural development to buffer and compliment farmland in the RA.

Create zoning standards to enhance the function and appearance of the Gateway Corridor (GC), particularly the NC 24 corridor.

The public open house workshop identified several areas where public support exists for strengthening

regulations along the NC 24 corridor. Implement the recommendations of the Gateway Corridor Plan, including but not limited to enhancement of the Gateway Corridor character area through development guidelines and ordinance standards that:

- Preserve or create deep and enhanced, landscaping buffers between roadway and development site.
- Encourage residential building setbacks and massing that blend in with the natural environment.
- Significantly restrict individual access drives and require cross-access between adjacent parcels and sites unless absolutely unachievable.
- Discourage frontage streets, or if allowed modify setbacks accordingly.
- Create pedestrian-supportive infrastructure (sidewalks, crosswalks, signals, etc.) along the gateways.
- Create parking location requirements, with strong preference for parking in the rear of buildings, and enhanced screening requirements that provide consistency and contribute to the appearance of the corridor.

Infrastructure Carrying Capacity

Direct development to places that can support it while also reinforcing the community character and social fabric.

The best way to connect people to destinations is to place them in proximity to each other. Locate higher density residential development within walking distance of goods and services to strengthen businesses, reduce vehicular traffic, and encourage active transportation. Consider existing built form and community characteristics when reviewing new development.

Allow dense, context-sensitive development in areas that have adequate public service, proximity to goods and services, and resiliency to foreseeable environmental threats. Mixed use development, both horizontal and vertical, should be encouraged where appropriate.

Consider incentives for infill growth such as by-right approval processes, while also requiring development to connect to utilities and pay for needed system upgrades.

Prioritize utility system upgrades.

Continue to work with ONWASA to prioritize water and sewer expansion and distribution to targeted areas in accordance with the Future Land Use Plan. Prioritize utility system upgrades for mixed use areas. Incorporate concepts and design that respect the current and future vulnerability of these facilities to a changing climate, storms, and sea level rise.

Evaluate the cost of providing services to new development and use that information when evaluating proposed developments or extending utility services.

By using a measurable metric, such as cost per linear foot of street frontage, a community can quantify existing public services costs, and estimate the impact that future development will have if the town is required to take over infrastructure and provide services. A benchmark figure will assist decision makers in evaluating the long-term impact of service extension and growth. Ultimately, the cost of services and infrastructure provided by the town must be recouped, and a balanced approach can be best informed with knowledge of those costs.

Identify funding sources and partnership opportunities.

Investigate potential funding sources for the water system and utilize inter-local agreements with either the County or ONWASA for annexation and utility service provision, as appropriate.

Natural hazard areas

Continue to provide information to residents and the development community on the risks and best available data relating to environmental resources and conditions.

Continue education efforts related to flooding, storm surge, sea level rise, stormwater, and governmental programs and processes related to each. This may include becoming involved in the Community Rating System (CRS) and potentially other programs related to flood protection and flood insurance.

Prioritize capital improvement projects in areas that will increase overall resiliency to storms and flooding.

- » Identify priority areas and actions to make the town more resilient to storms and flood events using VCAPS process and knowledge of recent storms.
- » Evaluate public and private infrastructure for risk, especially critical infrastructure (operations center, police/fire/EMS stations, water and wastewater treatment plants, hospitals, assisted living facilities, etc.), and use this evaluation to guide future locations and expansions.
- » Consider locating highly critical infrastructure well outside of the 500-year floodplain, while less critical infrastructure may be in more flood prone areas with disruptions anticipated but minimal. The nature of each infrastructure component will determine how risk-adverse the public is to a lapse in service.
- » Map and identify stormwater infrastructure that needs upsizing or replacement, and incorporate into capital improvement planning.

Use current, best available sea level rise projections and environmental vulnerability knowledge when making public infrastructure investment decisions.

Public investments communicate to the public that an area is “safe”. They are also frequently lasting decisions that obligate funds for construction, operation, or maintenance for many years. A town that appropriately sites new infrastructure will be more likely to be prosperous and safe.

- » Consider retracting services or strategically abandoning infrastructure in areas that are likely to be risky or dangerous.
- » Major public facilities (hospitals and resident-occupied health facilities, operations centers, water/wastewater facilities, etc.) should be located in areas that will not flood during intense storm events (500-year or 1,000-year), and access to these facilities should also be hardened against storm impacts.
- » New roads should only be allowed if built to withstand a significant storm event without flooding, and even then should be located entirely outside of floodplains.
- » Utilize the information from the VCAPS process regarding projected future floodplains (see Appendix).

Strengthen development standards to enhance resiliency to storms, flooding, and an uncertain climate future.

- » Require new construction be built to withstand lower probability / higher impact storms (500-year, 1,000-year, etc.) to reduce damage liability, economic losses, and speed recovery when these events occur. This will be especially important as future floodplain limits will expand as noted on new FIRMS which

are based on SLOSH storm surge modeling. Incentives to reduce insurance costs could also make this strategy more achievable.

- Perform analyses to identify areas that will likely become the new 100-year floodplain as sea levels continue to rise and consider restricting development or enhancing development regulations in these areas. Look for future guidance from FEMA on this particular subject.
- Encourage or incentivize low impact development techniques by updating stormwater ordinances and improving outreach efforts. Updates should include but not be limited to:
  - Encourage reduction of impervious surface cover and increased use of permeable surfaces
  - Allow naturalized detention areas, rain gardens, and bioswales to satisfy open space requirements
  - Consider zoning overlays in areas of specific stormwater management concern that require certain types of stormwater or flooding management techniques
  - Treatment and storage of stormwater on-site, where appropriate
  - Implementation of Low Impact Development (LID) or green infrastructure stormwater and water quality measures, where appropriate; this may involve multi-property solutions
  - Implementation of projects that enhance or restore shoreline or wetlands, or otherwise improve water quality and the natural environment
- Consider requiring a higher freeboard requirement (2- or 3-foot) for new development and/or in places that are particularly susceptible to flooding or storm surge with or without wave action.
- Develop unique solutions to mitigate future flooding in the historic waterfront district in order to preserve the town's heritage and history.

Review and revise the Watershed Restoration Plan to ensure that it anticipates and addresses existing and future issues.

- Identify opportunities for retention and green stormwater infrastructure that can serve infill and redevelopment
- Consider regional stormwater detention solutions for future employment sites or other large development sites; consider partnership with developers (or regional solutions)

Scrutinize development in environmentally-sensitive and flood-susceptible areas Conservation Priority Areas (CPAs).

Consider requiring the mapping and quantification of the CPAs when reviewing new development applications in these areas. Note that these areas are comprehensively mapped herein, and local criteria should be created to assist developers in making on-the-ground inventories, similar to the mapping of stream buffer corridors. This information should then be used during preliminary and final development application decisions. It may also be beneficial to encourage or even incentivize the clustering of development outside of the CPAs.

Water quality

Create zoning standards and strategies to address development in Conservation Priority Areas (CPAs).

Restrict the development of natural areas, especially in floodplains, to preserve water quality. Clustering

and other density transfer strategies will help protect priority environmental areas, as well as keep new development further from harm's way, as in the case of king tides, and storm-related flooding.

Continue to implement the Town's watershed restoration plan.

The town has recently obtained funding to install retrofit stormwater solutions to improve water quality. Any historic downtown has challenges when dealing with stormwater, since regulations did not exist when the town developed. Continuing to implement stormwater solutions is important to water quality, especially since much of the development of the town predates current stormwater control regulations. The Town may also choose to increase regulation of stormwater or raise stormwater fees to pay for other mitigative measures.

Combine waterfront access with habitat restoration and storm resiliency.

- Enhance water quality and storm resiliency while also providing increased access to public trust waters.
- Pursue funding from multiple sources to achieve complimentary outcomes.
- Consider additional setbacks from salt marshes, per the recommendations from the VCAPS process.
- Consider implementing the Living Shorelines recommendations from the VCAPS process.

Invest in water quality projects that enhance both quality of life and natural environment.

One of Swansboro's primary assets is the waterfront and coastal character of the town. Water quality and the natural environment is a major reason that people continue to settle in the town. Protection of water quality is crucial to the town's long-term vitality. Zoning and development standards are the primary avenue to locally influence water quality, and protective standards should be incorporated into the ordinance, including but not limited to:

- Reduction of site impervious surfaces
- Treatment and storage of stormwater on-site, where appropriate
- Implementation of Low Impact Development (LID) or green infrastructure stormwater and water quality measures
- Implementation of projects that enhance or restore shoreline or wetlands, or otherwise improve water quality and the natural environment
- Disconnected and/or enhanced Stormwater Control Measures (SCMs), possibly requiring measures in excess of state standards

Other community priorities

Prioritize new pedestrian infrastructure.

Identify potential pedestrian connections (sidewalks and multi-use trails) between high residential density areas and popular destinations and include those projects in the Capital Improvement Plan.

Destinations identified at the public open house workshop include:

- Areas north and south of NC 24
- The historic downtown
- Parks and recreation facilities
- Waterfront access areas

- Hammocks Beach State Park
- The intersections of NC 24 with Hammocks Beach Road and Old Hammock Road
- Queens Creek Road
- Main Street Extension

Facilitate cross-departmental, inter-agency, and inter-jurisdictional coordination.

Encourage collaboration to provide county services that support recommendations in this plan. Work with outside agencies (local, regional, state, federal) to implement land use decisions that reinforce and support the values of the town. Of particular importance are communication and coordination with the County and ONWASA on land use and service provision decisions and standards that occur just outside the town's ETJ, as these will have the greatest impact on the town.

Connect new and existing development to the broader community.

Institute requirements that connect development to nearby amenities, open spaces, residential and commercial areas, and road networks by implementing the following strategies:

- Limit maximum cul-de-sac length, and then only allow if a future connection is not achievable. Developing secondary connections between destinations is crucial to creating community and reducing congestion on major roadways.
- Establish maximum block lengths, and require achievable stub-outs. Where stub-outs would require a culvert or bridge, require the developer to pay fee-in-lieu for their portion of the future facility. Consider also adopting Appendix D of the NC Fire Code, which discusses access points, cul-de-sac length, and maximum number of units for safe provision of EMS/fire safety services.
- Update pedestrian and bicycle plans to address acquisitions and requirements for easements for these facilities. Require new construction to connect to existing or planned facilities.
- Strengthen connectivity policies to require interconnectivity and reduce traffic on main roads.

Enhance appearance and maintain small-town, coastal character.

The appearance and quality of appearance of structures, especially those with larger footprints (~40,000 sqft), should be balanced or mitigated by higher-quality materials and stormwater control measures, including but not limited to:

- Use of high quality materials and prohibition or reduction in the use of low quality materials.
- Breaking up the roofline or overall massing through architectural embellishments and fenestrations.
- Balancing greater impervious surface areas with:
  - Carefully considered setbacks that reduce visual impact - for instance, stepped setbacks.
  - Additional stormwater control measures, particularly Low Impact Development (LID) design.
  - Additional or enhanced landscape buffering, lighting, or pedestrian infrastructure and spaces.

Implement the actions identified in the VCAPS study (see appendix).

The community-identified actions and solutions identified in the VCAPS study are incorporated in this report as an appendix and include priority actions. Planning and implementation of this sort is a major step toward creating a more climate resilient future for Swansboro.

VCAPS SUMMARY

FINAL REPORT

Town of Swansboro
Preliminary Asset Mapping & VCAPS Report
December 17, 2018

Asset Mapping Summary

Key representatives from the Town of Swansboro and Onslow County met with a group of facilitators on July 10th to begin mapping the town's critical assets and areas known for frequent flooding. Present at this meeting were:

Participants

Scott Chase, Manager, Town of Swansboro
Paula Webb, Town Clerk, Town of Swansboro
Andrea Correll, Planner, Town of Swansboro
John Freshwater, Engineer
Angelia Hagopian, Onslow County GIS
Brent Hatlestad, Town of Swansboro, Commissioner
Brent Lanier, Surveyor
David Mohr, Engineer, ONWASA
Patricia Pike, Onslow County GIS
Frank Tursi, Mayor Pro Tem, Town of Swansboro

Facilitators

Mike Christenbury, N.C. Division of Coastal Management
Lora Eddy, The Nature Conservancy
Tancred Miller, N.C. Division of Coastal Management
B. Stevens, N.C. Coastal Federation Intern
Madeline Tripp, N.C. Coastal Federation Intern
Jessica Whitehead, N.C. Sea Grant

The purpose of this project was to identify and map important social and physical assets in Swansboro that may be vulnerable to current and future impacts from coastal hazards, including sea-level rise and storm surge. The planning process will help Swansboro identify hotspots where the town can prioritize resilience-building projects. Through the process, participants will also identify local government and community-specific needs in building resilience.

Local knowledge mapping helps the town identify the locations of physical and non-physical assets that are important to both the government and the community. Through this process, local government staff and officials explored their physical and social vulnerabilities. Participants used maps provided by Onslow County, pre-populated with many of the town's critical assets, and added knowledge of areas with known flooding problems or other vulnerabilities. The maps now identify specific areas, such as streets, intersections, and buildings, that the town can target for resilience work. The final map and guide for Swansboro can be used for resilience planning purposes, and to support future grant applications to fund projects in areas in need of adaptation or mitigation projects.

Although not included in this project, additional social vulnerability indicator data exists, such as census data on reported income and data on property tax value. Such indicators can be used to identify areas where financial resources for recovery post-disaster may be limited. Other social vulnerability indicators

such as concentrated areas of 65+ residents, and concentrated areas of non-English speakers, were not identified in Swansboro.

After the mapping meeting, Onslow County staff transferred the data that was collected onto a digital map through ArcGIS, and has provided a copy of this map to Swansboro.

The Nature Conservancy (TNC) will also host Swansboro's map data on their coastalresilience.org web portal, so that local government staff and the public can overlay sea level rise and coastal flooding models to the maps. TNC's Coastal Resilience mapper currently has both federal (NOAA) and state data for a variety of future scenarios; all federal data are readily available for download through the NOAA Digital Coast's Coastal Flood Mapper. State data was acquired from NC Emergency Management through a public records request. For data or information on this project contact NC Emergency Management. Potential datasets include:

1. Coastal Flood Hazard Composite - Provides a quick visual assessment of areas most prone to flood hazard events.
2. Shallow Coastal Flooding - Areas subject to shallow coastal flooding.
3. FEMA Flood Zones - Areas at risk from flooding.
4. Storm Surge - Areas at risk from storm surge.
5. Sea Level Rise - Areas likely to be inundated by sea level rise.
6. Sea Level Rise and Coastal Flooding

In Swansboro, current available flood data overlays include sea level rise and sea level rise with projected future flood conditions for storm surge from North Carolina's Division of Emergency Management's 2014 Sea Level Rise Impact Study. Scenarios that can be explored include the increase of relative sea level by 20, 40 and 100 cm over existing conditions as well as modeled coastal flooding with 20, 40 and 100 cm of sea level rise for a 10-year flood event, a 100-year flood event, and past flooding from Hurricane Fran (1996).

In the future, town staff can hold public workshops to better understand community priorities in the face of flooding, sea level rise, wetlands loss, storm surge, or other hazards.

Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPS) Summary

The facilitation team adapted the Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPS) process to help the Town of Swansboro use mapped assets and data to consider actions that could reduce the Town's overall vulnerability to multiple hazards of concern. The scope of this process was limited to actions that could be taken in the context of a land use plan and the related educational, informational, and planning actions necessary to set policy that reduces vulnerability and builds resilience. A group of stakeholders with professional knowledge related specifically to land use planning processes met on August 23, 2018:

Participants

Scott Chase, Manager, Town of Swansboro
Andrea Correll, Planner, Town of Swansboro
Paula Webb, Town Clerk, Town of Swansboro
John Davis, Mayor, Town of Swansboro
Phil Keagy, Commissioner, Town of Swansboro
Brent Hatlestad, Commissioner, Town of Swansboro
Roy Herrick, Commissioner, Town of Swansboro

Pat Turner, Commissioner, Town of Swansboro
Frank Tursi, Mayor Pro Tem, Town of Swansboro
Brent Lanier, Surveyor
Jerry Seddon, Planning Commissioner, Town of Swansboro
Ralph Kohlmann, Planning Commissioner, Town of Swansboro
Larry Philpot, Planning Commissioner, Town of Swansboro
Walter Hancock, Planning Commissioner, Town of Swansboro
John Freshwater, Engineer
David Mohr, Engineer, ONWASA
Dave Newsom, Engineer

Facilitators

Jessica Whitehead, N.C. Sea Grant
Jane Harrison, N.C. Sea Grant
Tancred Miller, N.C. Division of Coastal Management
Mike Christenbury, N.C. Division of Coastal Management
Lora Eddy, The Nature Conservancy
Sarah Watson, S.C. Sea Grant
Gloria Putnam, NC Sea Grant
Sarah Spiegler, NC Sea Grant

Results from initial scoping interviews were combined into input from two breakout groups to generate a synthesis diagram that tracks how hazards and stressors of concern relate to outcomes and consequences in the context of land use. Participants used this conversation to generate ideas about potential actions, as well as to note any contextual factors that may enhance or limit the effectiveness or desirability of any actions. Actions are also further separated into actions for both the public sector (Town, County, state, and federal government, including the academic sector) and private sector (residents, businesses, NGOs, and other organizations).

It is important to note at this phase these actions are conceptual, and all require further discussion, study, and vetting with the Town of Swansboro and the public before becoming policy. Given that these actions were suggested by a small local group, they need to be reviewed by this group to ensure they were captured accurately by the facilitation team. Additionally, because the group was limited in its participation due to the facilitation team's size, additional public input will be invaluable in capturing additional potential ideas as well as in prioritizing those actions that were suggested. The former point is key in the wake of Hurricane Florence – while impacts of sea level rise and extreme rainfall were discussed, it is likely that there are additional key lessons to be learned by infrastructure performance under those extreme storm surge, wind, and rainfall conditions.

The Town considered actions resulting from the impacts of multiple hazards: tropical storms and nor'easters, including heavy rainfall and the prevailing wind direction during the event, sea level rise, and king tides. Participants also noted additional stressors of boat traffic (primarily affecting erosion) as well as development (commercial and residential development inside the Town and outside its ETJ). Overall, through interviews and the meeting participants from the Town identified 60 public sector actions and 12 private sector actions that could be considered in either the land use plan or related activities to improve Swansboro's resilience to these hazards and stressors. Two of those public sector actions were actions enabled by other actions, and three of the private sector actions were direct results from other public sector actions. The VCAPS diagram provides a conceptual map of how these actions relate to specific outcomes and consequences from these hazards. Additionally, tables are included of all these actions and of actions specific to each category. Generally, actions fell into five categories:

1. Educational efforts, including needs to inform or educate both the public and other levels of government
2. Informational needs, encompassing key critical scientific, legal, policy, and engineering issues requiring further study, including areas where best practices are still evolving (e.g., how to develop stormwater design standards that can accommodate a range of sea level rise and extreme precipitation scenarios)
3. Planning needs, including obtaining funding for planning and project design and implementation
4. Policy needs, including new requirements, at the Town level and at other levels of County, state, and federal government impacting the abilities of the Town
5. Implementation actions, or decisions that must be made and put into effect to alter resilience

Some of the actions may be easily implemented in the land use plan. However, the Town should review these actions and consider which of these may be sequential – for example, digital maps of the stormwater system are needed to consider new stormwater plans and policies for retrofitted system upgrades as well as to develop incentives for stormwater controls. Additionally, the Town should prioritize some of these actions using locally agreed upon criteria. Past towns who have used the VCAPS process, like the Town of Nags Head, found this prioritization step valuable. Prioritizing will help the Town consider not only how to consider these sequential actions, but also help develop a strategy that allows Swansboro to pursue projects that are relatively simple to implement, like educating about living shorelines, as well as actions that may be more difficult to accomplish yet ultimately carry great benefit, such as how to incentivize buffers. Two ways past VCAPS communities have approached prioritizing actions have been through an additional review committee (as done in the Town of Nags Head, which established a Climate Change and Sea Level Rise Committee), or through public workshops with additional input (as done in Beaufort County, South Carolina).

On November 19, 2018 the Town of Swansboro hosted a public meeting to gather public input on the actions identified through the VCAPS Workshop. The meeting was advertised through the town's communication channels, media and direct mailing.

It was an open workshop format with 3 stations:

1. Informational station – The public could review posters with data and information from the National Climate Assessment and Southeast Regional Climate Center on potential climate change impacts including increased precipitation, heavy downpours and sea level rise.
2. Map station – The public was invited to add information to the Asset Map created as part of this planning process. Paper maps were provided for review and participants were encouraged to ground-truth the town's physical vulnerabilities.
3. Voting station – The public was asked to help prioritize the VCAPS Adaption Actions identified by the team as within the scope of what the Town of Swansboro could do in the land use plan update. Actions were broken into 5 categories education, studies/information, planning, policy, and implementation. Participants were asked to vote on their top 3 – 5 needs in each category. The complete results of the voting exercise are included in the report appendix, but the top 3 priorities for each category are included below:

Education: During the initial VCAPS the Town identified four potential educational needs that the Town of Swansboro could fill to help make local land use more resilient to challenges related to climate change and sea level rise. The top 3 public priorities were:

- Town works with state to allow streamlined low impact development permits to reduce pressures from increased stormwater volume

- Town develops an education plan for contractors on low impact development options to reduce pressures from increased stormwater volume
- Town develops education plan for residents on environmental hazards to reduce challenges to existing homes that are at risk of flood.

Informational needs: During the initial VCAPS the Town identified six potential needs for more information or studies that the Town of Swansboro needs to fill to help make local land use more resilient to challenges related to climate change and sea level rise. The top 3 public priorities were:

- Find (and expand upon) ways to preserve natural areas and green space to reduce pressures from increased stormwater volume
- Map older sections of existing stormwater system to reduce stress on infrastructure from increased stormwater volume
- Identify ways to use design standards that incorporate future conditions to improve development

Planning needs: During the initial VCAPS the Town identified five potential needs for more planning activities that the Town of Swansboro needs to fill to help make local land use more resilient to challenges related to climate change and sea level rise. The top 3 public priorities were:

- Town applies for, receives, and uses 319 funds to improve infrastructure to reduce stress on infrastructure from increased stormwater volume
- Town asks DOT to increase pipe size under DOT-owned roads to reduce stress on stormwater infrastructure for pipes that are too small to convey the larger stormwater volume
- Planning board considers how to control stormwater in activities to improve development

Policy needs: During the initial VCAPS the Town identified 24 potential needs for policies and approaches that the Town of Swansboro needs to fill to help make local land use more resilient to challenges related to climate change and sea level rise. Because there were so many additional needs identified as policies, public attendees were allowed up to 5 top votes. Due to a tie, the top 6 public priorities are listed here:

- Incentivize density on appropriate parcels to avoid developing ecologically sensitive lands to improve development
- Require, not just encourage, getting stormwater back to ground (will require engineering to review ways of doing this) to reduce pressures from increased stormwater volume
- Expand buffers on salt marsh to 50 feet to slow wetland loss
- Encourage low impact development to increase onsite holding in site design, especially the first flush of stormwater, early in process to reduce pressures from increased stormwater volume
- Require subdivisions in town to tie in to sewer and water to improve the resilience of residential development
- Pass a 2-3 foot freeboard ordinance to reduce the number of structures which flood

Policy needs: During the initial VCAPS the Town identified 13 potential needs for activities to implement on the ground that the Town of Swansboro needs to fill to help make local land use more resilient to challenges related to climate change and sea level rise. Due to a tie the top 4 public priorities were:

- Convert roads to one way (roads need less impervious surface and restore water via larger buffers) to reduce deterioration on roads
- Town preserves coastal wetlands to slow wetland loss

- Add greenway systems for habitat conservation to slow wetland loss (public notes this would require significant funding)

Town applies for funds to clear ditches, then clears ditches to improve stormwater flow. The Town's goal was to use the information collected through this integrated planning process to incorporate resilient actions into their Land Use Plan (LUP) update. By engaging the community of Swansboro in the process, town staff has started the dialogue about building community resilience in the face of increased precipitation and heavy downpours, sea level rise, and increased frequency and severity of storms.

Appendix: Charts of Full Public Voting Priority Results

During the meeting on November 19, participants voted to prioritize adaptation actions under the education, information needs, planning activities, policies needed, and implementation initiatives. Each participant was allowed to vote for their top 3 choices under each category, with the exception of policies needed (because of the large number of potential policies, participants could vote for their top 5 priorities). The full list of votes is included below. In each case, the challenge which each action is intended to address is also included. The listed challenges, along with each action, corresponds to those located within the VCAPS diagram. The top vote getting actions in each category are in bold type. Participants were also allowed to add their own actions to the charts; these added text are indicated in blue italic type.

Educational needs

CHALLENGE	EDUCATION NEED FOR TOWN TO FILL	PRIORITY
Increased stormwater volume	**Education plan for contractors on low impact development options**	**24**
	Town works with state to allow streamlined low impact development permits	**25**
Existing homes at risk of flood	**Education plan for residents on environmental hazards**	**11**
Development	Education plan for homeowners on higher density and stormwater control options	9

Information Needs

CHALLENGE	INFORMATION NEED FOR TOWN TO INVESTIGATE	PRIORITY
Sea level rise	Identify hot spots for development/roads in land use plan for 6 ft worst case scenario	7
Increased stormwater volume	**Find ways to preserve natural areas and green space expand upon*, they exist***	**21**
Increased stormwater volume stresses infrastructure	**Map older sections of existing stormwater system**	**10**
Development	Develop uphill solutions to stormwater volume to reduce downstream pressure with sea level rise	7
	Identify existing areas to retrofit for sea level rise	6
	Identify ways to use design standards that incorporate future conditions -->	**8**
Participant-added suggestions	*Protect all sea life*	5
	Control growth: commercial and residential	3

Planning Activities

CHALLENGE	NEW TOWN PLANNING INITIATIVES NEEDED	PRIORITY
Sea level rise	Planning board considers sea level rise scenarios based on policy	0
Stormwater pipes too small	**Town asks DOT to increase pipe size under DOT-owned roads**	**21**
Stormwater volume stresses infrastructure	**Town applies for, receives, and uses 319 funds to improve infrastructure**	**22**
Development	**Planning board considers how to control stormwater in activities**	**13**
Structures flood	Town pursues mitigation funds for elevation	8

Implementation

CHALLENGE	NEW TOWN ACTIONS TO IMPLEMENT	PRIORITY
Heavy rainfall	Fire department re-uses roof water for truck washing *(More rain barrels?)*	4
Wetlands lost	Add greenway systems for habitat preservation *(significant funding required)*	9
	Town preserves coastal wetlands	10
Roads deteriorate	Convert roads to one way (roads need less impervious surface and restore water via larger buffers)	16
	Use Powell Bill, stormwater funds to cycle fixes to manage traffic and minimize damage	0
Ditches fill up	Apply for funds to clear ditches then clear ditches	9
Increased stormwater volume stresses infrastructure	When making stormwater system repairs elevate outfalls to be above higher tides and surges	3
Increased stormwater volume	Add catch basins, ponds w/ stormwater fees	4
	Town does demonstration LID projects	0
	Improve easements	1
	Town moves to local control *(requires engineering review)*	6
Structures flood	Assist with elevating homes	3
	Use tax (visitor occupancy) for flood control/infrastructure repair	0
Stormwater runoff (Participant-added suggestion)	*Work with ONWASA to provide monetary incentives to residential/commercial (via $ credit on bill) to create onsite rainwater gardens*	*5*

Policies Needed

CHALLENGE	NEW TOWN POLICY INITIATIVES NEEDED	PRIORITY
Sea level rise	Require disclosure at land sale (flood, sea level rise, hurricanes, machine gun)	6
Wetlands lost	**Expand buffers on saltmarsh to 50 ft**	**9**
	Implement CAMA wetland conservation zone	6
	Incentivize wetland buffers with front yard depth requirement adjustment	3
Erosion	Incentivize living shorelines	4
Increased stormwater volume	**Encourage low impact development to increase onsite holding in site design, especially first flush of stormwater, etc. early in process**	**7**
	Incentivize developers for low impact development	4
	Require developers to build parks	3
	Require, not just encourage, getting stormwater back to ground ***(will require engineering to review)***	**9**
Increased stormwater volume stresses infrastructure	Raise stormwater fee	0
Development	Pass stronger guidelines on design to make it more acceptable	1
	Incentivize density on appropriate parcels to avoid developing ecologically sensitive lands	**11**
	Use proposed floodplain in land use plan	4
	Enact stormwater control ordinances to include volume	
Development in adjacent areas	Town partners with County *(+ ONWASA)* on incentives in adjacent areas to encourage annexing in	3
Commercial development	Ask developers to reduce commercial parking spaces to reduce impervious	1
Residential development	Ask developers to reduce residential parking spaces to reduce impervious surface	1
	Encourage cluster development to avoid wetlands and not have to pay developer	2
	Require subdivisions in town to tie in to sewer/water	**7**
Homes built in flood zones	Make the Floodplain Administration board more powerful	
	Require special use permits to build in flood zones	5
Structures flood	Enact redevelopment ordinances to improve elevation after storms	2
	Increase sales tax and use funds for flood repairs	0
	Pass 2-3 ft freeboard ordinance	**7**

Existing Critical Asset/Facility Protections

Summary

Swansboro has identified its critical assets/facilities in both its Land Use Plan (LUP) and Hazard Mitigation Plan (which includes a map) and has prioritized the functions of each of these facilities in the case of an emergency/natural disaster. The biggest threat to the town, as identified by the Hazard Mitigation Plan, are hurricanes and the associated wind/flood damage. Several mitigation strategies were adopted in this plan, such as considering entry into FEMA's Community Rating System, or maintaining ditches and installing more lift stations.

In the LUP, there is zoning to discourage development in natural hazard areas or areas with low land suitability, and requirements for mitigation in developments in these areas (p.27, p.63). When determining land suitability, storm surge areas and flood zones are given considerable weight, and coastal wetlands are considered to have very low suitability. The LUP also has policies that support informing residents about sea level rise, flood mitigation strategies, and the dangers of development in natural hazard areas in collaboration with state or federal efforts (P.65, P.70).

In the Unified Development Ordinance (UDO), there is a Flood Damage Protection Ordinance, which addresses new development/redevelopment in the Special Flood Hazard Zone and establishes a stringent permitting process for these developments. There's also a Storm Water Management Ordinance, but this mostly addresses problems with polluted storm water runoff rather than flooding. However, it does suggest encouraging low impact development, decreasing impervious surfaces, and implementing storm water controls such as constructed wetlands, which would help mitigate flooding. In addition to this, there is a flexible development land use category which requires the use of Low Impact Development in site designs.

CAMA Land Use Plan:

- Identifies flood zones and potential hurricane scenarios (using SLOSH model, Section 5B1(c))
- In the Land Suitability Analysis Criteria, Storm Surge and Flood Zones each have 2 points of weight (the highest weight is 3 points); plots inside these zones have low suitability.
- Swansboro allows development in natural hazard areas (land susceptible to sea level rise, erosion, flooding, and/or wetland/conservation areas) if it complies with all local, state, and federal regulations, and implements mitigation strategies (P.18, P.27, P.28, P.63, P.66, P.68, P.71, P.73, I.43, I.44, I.45)
- Swansboro supports the installation of bulkheads to protect against erosion and sea level rise (P.67)
- Swansboro supports efforts to inform residents about sea level rise, flood mitigation strategies, and the dangers of development in natural hazard areas (P.65, P.70)

Unified Development Ordinance

- Flood Damage Protection Ordinance (Article 22, effective Aug. 2005, now §152.400-.462)
    - Objective: minimize potential for flood damage to new developments and to prevent developments from redirecting floodwaters to other properties
    - Identifies Special Flood Hazard Areas, based on FEMA maps (FIRM and FHBM)
    - Requires a **Floodplain Development Permit** before any construction within Special Flood Hazard Areas
        - Floodplain Administrator is in charge of reviewing permit applications
    - Establishes protocol for appeals and variances; decisions made by the Flood Management Appeals Board (4 members appointed by Board of Commissioners: general contractor, a surveyor, an architect, and/or an engineer)
- Flexible Lot Development
    - Allows for variety in development, so that uses take advantage of unique characteristics of location and environmental resources
    - **Requires LID** strategies to be incorporated in plan

Hazard Mitigation Plan:

- Identifies potential hazards, vulnerabilities, and mitigation strategies/goals for the town of Swansboro, maps critical facilities
- Natural hazards: hurricanes and associated wind and flood damage
- Swansboro considers critical facilities to be "those structures from which essential services and functions for the continuation of public safety actions and disaster recovery are performed or provided."
    - Divides facilities into Level 1 (Must not lose operational capacity) and Level 2 (Must be operational within 24 hours following event)
        - Level 1: Swansboro Public Safety Headquarters/ EOC, EMS/ Police/ Fire Communications Tower, Water Tower (ONWASA, Wastewater Plant (ONWASA), Wastewater pump lift stations (ONWASA)
        - Level 2: Swansboro Town Hall, Major roads and bridges, Major government buildings, Emergency shelters (schools)
- Mitigation strategies:
    - Strategies include maintaining an evacuation route, flood/hazard education programs for residents, considering entry into FEMA CRS, maintaining ditches and installing more lift stations, and developing a Comprehensive Emergency Management Plan.
    - References policies in place in the CAMA Land Use Plan, the Unified Development Ordinance, Code of Ordinances, and NC State Building Codes

Note: Text in blue was added on 01/14/2019.

Recommendations:

- Evaluate efficacy/efficiency of existing stormwater systems and identify current and potential weaknesses (could complete a comprehensive assessment if resources are available)
- Create a Stormwater Management Plan, including strategies for increasing stormwater BMPs (like permeable streets/gutters/sidewalks, rain gardens, etc), as well as a plans to update/improve existing stormwater infrastructure to increase the town's stormwater capacity.
- Create an ordinance to allow construction of Living Shorelines where appropriate instead of bulkheads (which are encouraged in LUP)
- Participate in the Community Rating System
- Incorporate sea level rise scenarios (medium and high) into planning efforts
- Participate in the Red Cross Ready Rating Program, and encourage business owners to complete an emergency plan
    - Could also create emergency plans for historic buildings
- Consider participation in the National Weather Service's StormReady program
- Adopt an ordinance (or add to the existing Landscape Ordinance) to encourage the preservation of natural vegetation, especially trees
- Increase freeboard requirement within town limits (could have variance for historic district)
- Create incentive program (taxes, priority in permitting process) for using Low Impact Development methods/strategies when constructing new developments or for retrofitting existing properties with LID
- Consider flood mitigation strategies for flood prone areas of historic district (elevation, dry or wet flood-proofing, increasing stormwater drainage capacity, etc.)

Resources:

- Swansboro Hazard Mitigation Plan (Annex 5 to Onslow County Hazard Mitigation Plan)
- CAMA Land Use Plan
- Unified Development Ordinance
- Town Zoning Map
- Looking to the Future: Alternatives for Reducing Flood-related Damage in Historic Communities, Milton, PA
- Keeping 74 Bridge Street Above Water: Lessons from the City of Newport and the Point Neighborhood on Protecting Historic Structures and Neighborhoods from the Impacts of Climate Change

LUP Policies/Implementing Actions Referenced:

P.18 Swansboro does not support light industrial development within fragile areas and areas with low land suitability (see Section 5.B.1.g., pages 35 to 40).

P.27 The Town of Swansboro supports larger lots, decreased impervious surface areas, and cluster development in conservation classified areas and areas with low land suitability (see future land use map, Map 16) through enforcement of the Town's UDO.

P.28 Swansboro supports continuing preservation/protection of its flood hazard areas.

I.26 Swansboro will evaluate the need to revise its UDO to improve the requirements for reducing the areas covered during development by impervious surfaces. This will reduce storm water runoff.

P.63 Swansboro will allow development within areas susceptible to sea level rise, shoreline erosion, and/or wetland loss which takes into consideration such conditions in project design development.

P.66 Swansboro will support development which will minimize flooding and resulting damage to life and property during normal and significant rainfall events.

P.67 Swansboro supports the installation of properly engineered and permitted bulkheads to protect against erosion and sea level rise.

P.68 Swansboro supports the US Army Corps of Engineers' regulations, the applicable guidelines of the Coastal Area Management Act, and the use of local land use ordinances to regulate development of freshwater swamps, marshes, and 404 wetlands.

P.69 Swansboro supports relocation of structures endangered by erosion, if the relocated structure will be in compliance with all applicable policies and regulations.

P.71 Swansboro supports hazard mitigation planning. The Land Use Plan and the Hazard Mitigation Plan should be consistent with one another.

P.72 The Town supports the Onslow County Emergency Management Plan for evacuation procedures/policy for natural disasters or man-made disasters.
P.73 Swansboro will allow development in conservation and natural hazard areas which is consistent with local zoning and meets applicable state and federal regulations.

I.43 Swansboro will cooperate with the US Army Corps of Engineers in the regulation and enforcement of the 404 wetlands permit process. Schedule: Continuing Activity.

I.44 Swansboro will coordinate all development within the special flood hazard area with the Town's Planning and Inspections Department, North Carolina Division of Coastal Management, FEMA, and the US Corps of Engineers. Schedule: Continuing Activity.

I.45 Swansboro will continue to enforce its existing zoning and flood damage prevention regulations found in the UDO. Schedule: Continuing Activity.

Existing Protections of Isolated Wetlands

Key Points:

- Swansboro supports the policies and permitting processes under CAMA and Section 404 of the Clean Water Act.
- Due to changes in interpretation/legislation in the past few years, gaps have been created in the protection of coastal NC's small, isolated wetlands by federal and state programs.
- Swansboro does not have policies or ordinances specifically targeting and protecting isolated, non-coastal wetlands not protected under federal or state law.

Findings:

In the existing Land Use Plan (LUP), Swansboro complies with all state and federal laws regarding wetlands and environmentally sensitive areas, including section 404 of the Clean Water Act and all CAMA regulations. However, in 2008, a statement by the EPA asserted that wetlands not adjacent to traditional navigable waters are not under 404 jurisdiction. In 2015, changes were made to 15A NCAC 2H .1300 to regulate only 2 types of the 16 formerly identified isolated wetlands in NC, and to allow discharges that impact one acre or less of isolated wetlands in the coastal region without a permit (15A NCAC 02H .1305(3). Combined, these changes create a gap in protection for small, non-adjacent/isolated wetlands and make it increasingly important that local municipalities adopt more stringent protections.

Currently, the town does not have many policies that go beyond protections under section 404 of the CWA. Most policies in regards to wetlands are statements of support for federal/state regulations. For example, policy 37 states that the town "supports coordinated efforts to preserve and protect the ecological and flood hazard benefits of freshwater wetlands, *as protected under Section 404 of the Clean Water act*." Swansboro also has a CAMA-required Environmental Composite Map that incorporates areas of environmental concern into their land suitability analysis. In addition to this, there are a few policies could have indirect benefits to isolated wetlands. Policy 93 mentions a commitment to Low Impact Development (LID), which the UDO is required in Flexible Lot Developments. In implementing action 21 and policy 65, the town supports the education of the public about "environmentally sensitive areas" and the dangers of location development in natural hazard areas, which could be used to support an education campaign about isolated wetlands.

Recommendations

- **Educate residents** about the benefits (ecological, economic, public health/safety) of protecting wetlands. Incorporate wetland education efforts into Implementing Action 21 of the LUP.
- **Define wetlands** in the LUP and Unified Development Ordinance to include not only 404-regulated wetlands, but also isolated, freshwater wetlands.
- **Update policies** 25 (define environmentally sensitive areas to include isolated wetlands), 37, and 89 in the Land Use Ordinance to include wetlands not protected under CWA(404), according to the previously mentioned definition.
    - Also include a discussion of town protections/definitions in the Wetlands Section of Existing/Emerging Conditions: Fragile Areas.
    - In policy 63, amend to include more specific requirements for development susceptible to wetlands loss (instead of "consideration" in project development).
- **Change zoning** to either include isolated wetlands as a new, separate zone (overlay map of isolated wetlands), or incorporate isolated wetlands into the existing conservation zone.
    - Could commission maps of Swansboro wetlands, or use existing maps (FWS, NCRS, NOAA)
    - Allow appeals process for landowners to challenge delineations they feel are inaccurate
    - If not included in conservation zone, which is included in policy 27 of the LUP (about using increased lot sizes, decreased impervious surfaces, and cluster development), could include in large lot residential zoning to encourage building on uplands and not disturbing wetlands on lot.
- **Create a wetlands protection ordinance** specific to the needs of Swansboro:
    - Include: definition of a wetland, fact finding, intent/goals, definition of regulated activities, standards for issuance of permits (general: e.g. no net loss of wetlands, and specific: e.g. mitigation ratios), and conditions which may be attached to permits
    - Model ordinance from the Association of State Wetland Managers
    - Wisconsin Model Ordinance
    - Study on Local Ordinance Effectiveness in NYS
- **Create a Wetland Review Board** to help review permit applications under ordinance
- **Institute subdivision regulations** requiring wetlands protection, encourage use of wetlands as open space/stormwater management
- **Institute incentives** to encourage wetlands protection, such as:
    - Reduce local real estate taxes for preserved wetlands
    - Density bonuses or development right schemes
    - Work with local land trusts to provide wetland owners who donate wetlands or conservation easements with tax benefits

Current Policies/ Implementing Actions Referenced in this Summary

I.21 Swansboro will endeavor to educate the public about environmentally sensitive areas and what actions they can take to help do their part in preservation. Education may be accomplished through public service announcements or through the development of printed materials that are distributed through mailings and/or posted on the Town's website. Schedule: Continuing Activity.

P.25 The Town of Swansboro supports the preservation and maintenance of its environmentally sensitive areas while promoting and capitalizing on its natural resources

P.27 The Town of Swansboro supports larger lots, decreased impervious surface areas, and cluster development in conservation classified areas and areas with low land suitability (see future land use map, Map 16) through enforcement of the Town's UDO.

P.37 Swansboro supports coordinated efforts to preserve and protect the ecological and flood hazard benefits of freshwater wetlands, as protected under Section 404 of the Clean Water Act of 1972.

P.63 Swansboro will allow development within areas susceptible to sea level rise, shoreline erosion, and/or wetland loss which takes into consideration such conditions in project design development.

P.65 Swansboro supports educating the public concerning the problems/impacts of developing/locating in natural hazard areas.

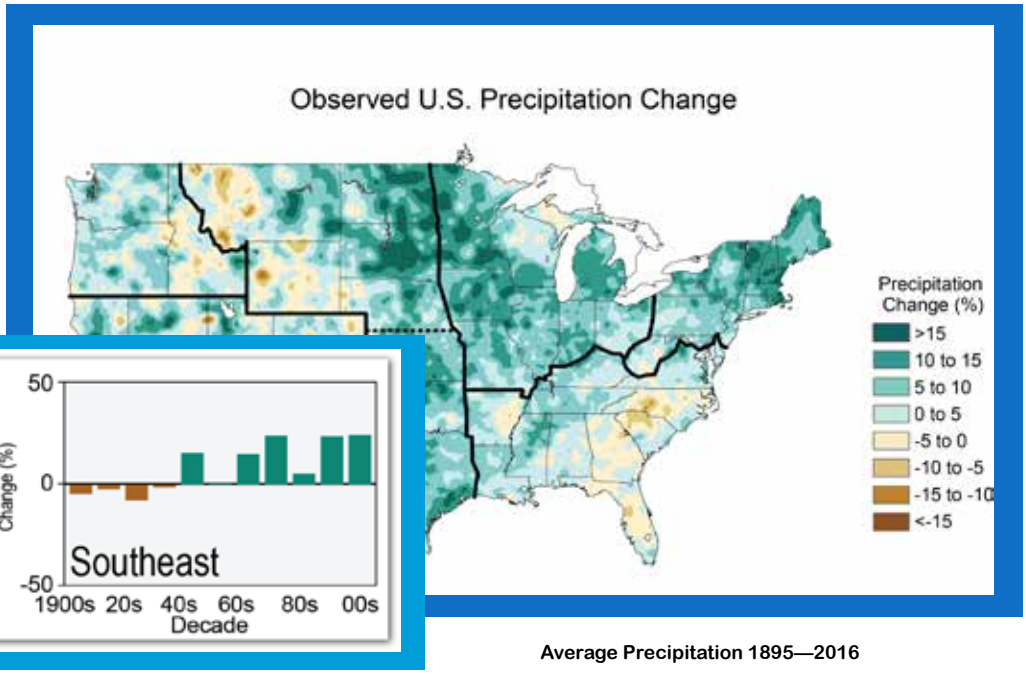
P.89 Swansboro opposes the installation of package treatment plants and septic tanks or discharge of waste in any areas classified as coastal wetlands, freshwater wetlands (404), or natural heritage areas. This policy does not apply to constructed wetlands.

P.93 Swansboro supports low impact development (LID). NOTE: LID is an ecologically friendly approach to site development and stormwater management that aims to minimize development impacts to land, water, and air. The approach emphasizes the integration of site design and planning techniques that conserve natural systems and hydrologic functions on a site. Low impact development is not a land use control, but a management and design strategy that is integrated into the proposed land use. It has also been shown to decrease costs to developers and to increase the desirability and value of the property.

TOWN MANAGEMENT CONCERN
STORMWATER

AVERAGE U.S. PRECIPITATION HAS INCREASED SINCE 1900; THE SOUTHEAST COAST IS EXPERIENCING INCREASES.

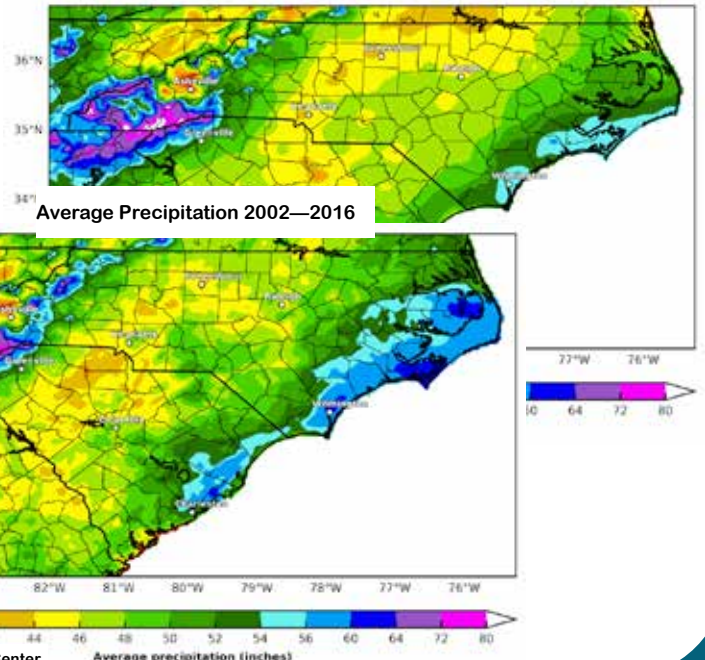
% Change in Precipitation amounts for 1991—2012 compared to 1901—1960
SOURCE: National Climate Assessment



Average Precipitation 1895—2016

HEAVY DOWNPOURS

Our heaviest rainfall events have become heavier and more frequent. And the amount of rain falling during these events has been significantly above average.



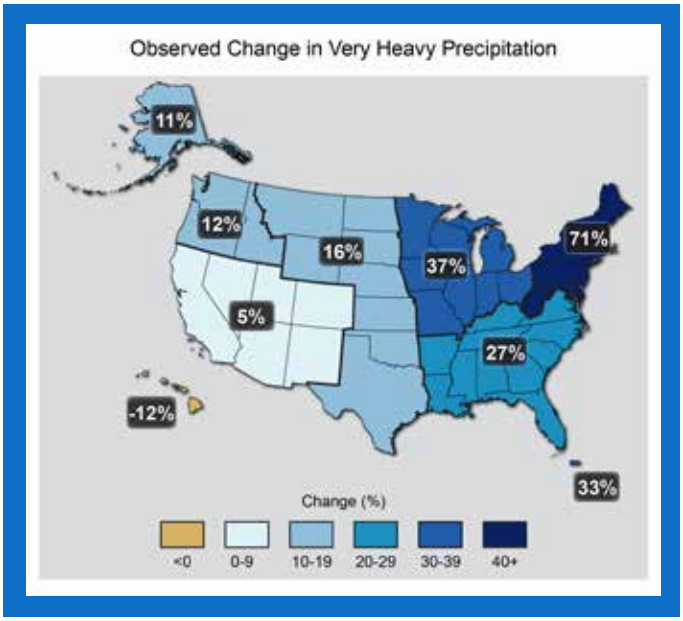
Average Precipitation 2002—2016

SOURCE: Southeast Regional Climate Center

TOWN MANAGEMENT CONCERN
STORMWATER

HEAVY DOWNPOURS ARE INCREASING NATIONALLY, ESPECIALLY OVER THE LAST THREE TO FIVE DECADES. INCREASES IN EXTREME PRECIPITATION ARE PROJECTED FOR ALL U.S. REGIONS.

Observed Change in Very Heavy Precipitation amounts for 1958—2012
SOURCE: National Climate Assessment

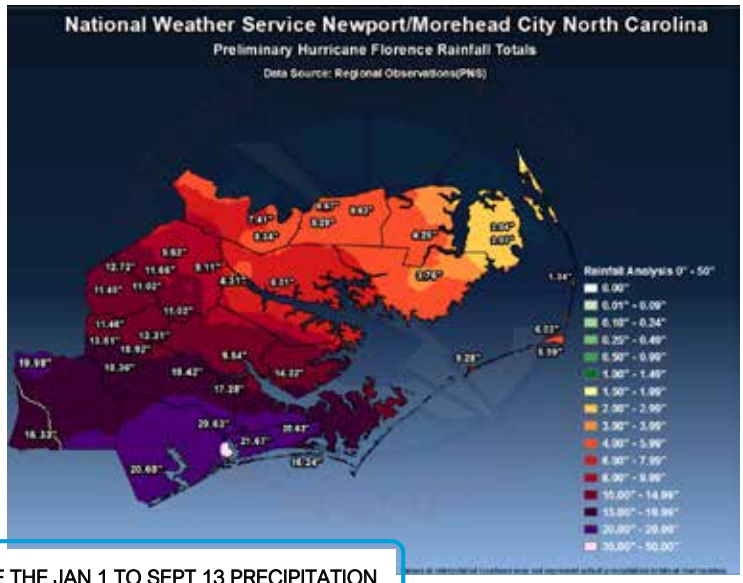


WARMER AIR = MORE PRECIPITATION

Since 1895 U.S. average temperature has increased by 1.3° F to 1.9°F. Warmer air can contain more water vapor than cooler air. Global analyses show that the amount of water vapor in the atmosphere has in fact increased over both land and oceans.

HURRICANE INTENSITY AND RAINFALL INCREASING

The intensity, frequency, and duration of North Atlantic hurricanes, as well as the frequency of the strongest (Category 4 and 5) hurricanes, have all increased since the early 1980s.

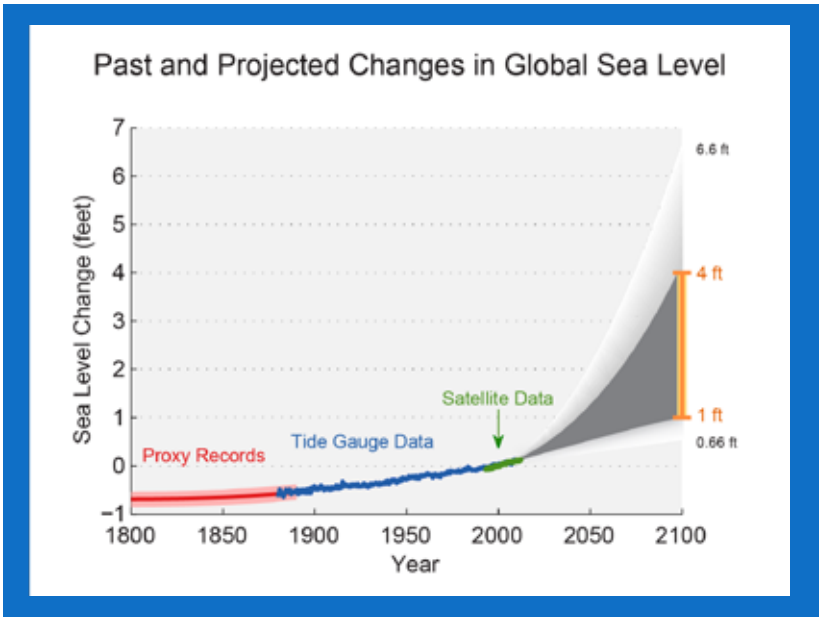


PRIOR TO HURRICANE FLORENCE THE JAN 1 TO SEPT 13 PRECIPITATION TOTAL WAS 46 INCHES; ABOVE AVERAGE AT THAT POINT IN TIME

TOWN MANAGEMENT CONCERN
SEA LEVEL RISE

GLOBAL SEA LEVEL HAS RISEN BY ABOUT 8 INCHES SINCE 1880. IT IS PROJECTED TO RISE ANOTHER 1 TO 4 FEET BY 2100.

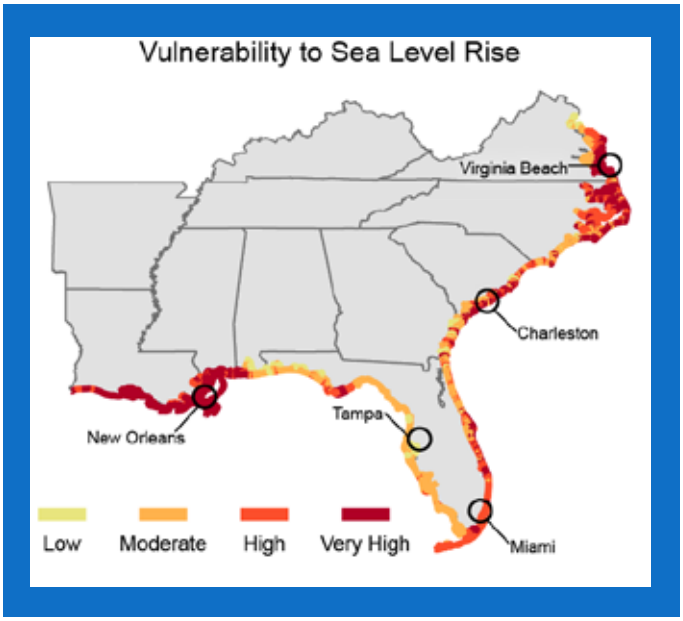
SOURCE: National Climate Assessment



WARMING OCEAN

The oceans are absorbing over 90% of the increased atmospheric heat associated with emissions from human activity. Like mercury in a thermometer, water expands as it warms up (this is referred to as “thermal expansion”) causing sea levels to rise.

Sea level rise poses widespread and continuing threats to both natural and built environments and to our waterfront and historic area.

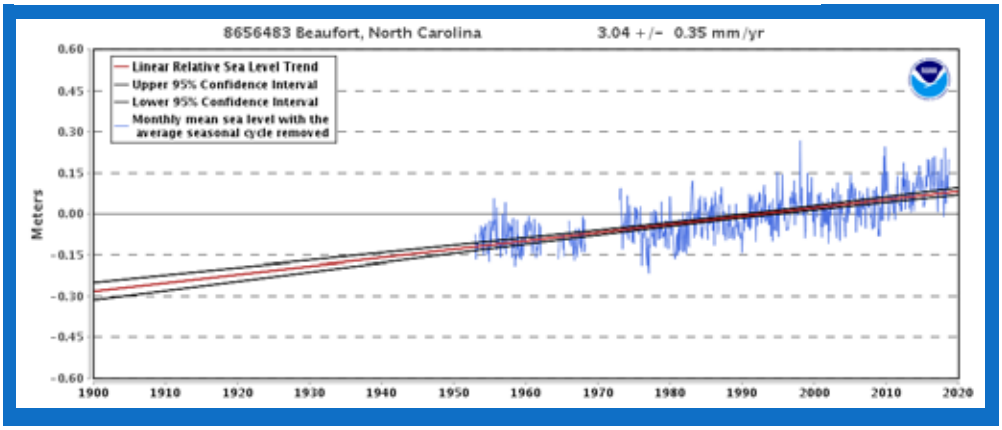


SOURCE: National Climate Assessment

TOWN MANAGEMENT CONCERN
SEA LEVEL RISE

SEA LEVEL IS RISING ALONG THE NORTH CAROLINA COAST. IT IS PROJECTED TO RISE ANOTHER 1 TO 4 FEET BY 2100.

NOAA Tide Gauges Sea Level Rise
SOURCE: National Climate Assessment

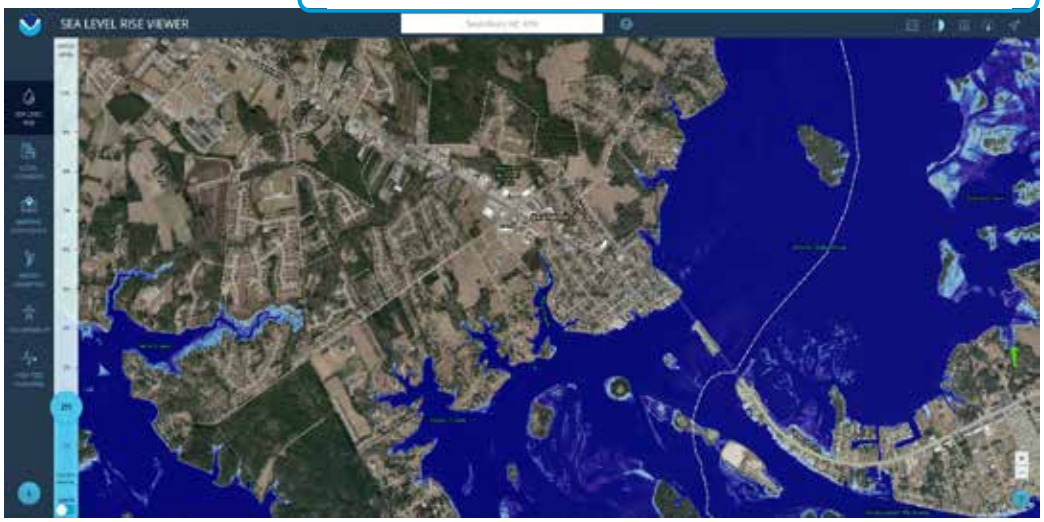


RISING SEAS = INCREASED EROSION & GREATER STORM SURGE

Many of our coastal marshes will be inundated and the protection they provide to wave action will be lost allowing greater energy along our shorelines and increasing erosion.

Rising seas will increase flooding risk from storm surge.

IN 30 YEARS THIS REGION MAY SEE <1 FT TO 2 FT OF SEA LEVEL RISE



SOURCE: NOAA Sea Level Rise Viewer

Swansboro VCAPS Diagram

The VCAPS Diagram produced by North Carolina Sea Grant, shown below (but not included at full scale in this Appendix due to format sizing), shall be adopted by reference. The VCAPS Asset Map shall also be adopted by reference. See low-resolution version of the Asset Map below.