LEWES, DE: Evaluation of Existing Rules, Codes, Documents, and Plans

April 14, 2014

Prepared for the City of Lewes, Delaware

Prepared by RCQuinn Consulting, Inc., Charlottesville, Virginia

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EXECUTIVE SUMMARY

Lewes, Delaware, is a coastal town with a geographical and historical bond to the sea. As a result of its proximity to the Delaware Bay, Lewes has weathered its share of coastal storms and associated impacts. The City is bordered by the Delaware Bay, as well as tidal wetlands, tidal creeks and tributaries. Lewes is also transected by a man-made waterway – the Lewes and Rehoboth Canal which is connected to Delaware Bay via Roosevelt Inlet. Lewes' proximity to water has led to initiatives to mitigate threats from coastal storms and flooding, as well as to efforts to reduce stormwater and drainage problems. Increasing impacts from coastal storms, sea level rise, and extreme precipitation events associated with climate change will likely exacerbate the City's known flood hazards.

With its strong history of hazard mitigation planning and preparedness, Lewes is perfectly poised to take advantage of this opportunity to review and assess its zoning, building codes and floodplain management regulations in order to minimize future flood impacts. While flood damage cannot be prevented entirely, some mitigation of those effects can be accomplished depending on choices and actions that Lewes makes over the coming years.

The City joined FEMA's National Flood Insurance Program (NFIP) in 1977, and has participated in the NFIP's Community Rating System (CRS) program since 1992. As a NFIP participating community, the City has adopted and enforces minimum floodplain management standards which are designed to provide some degree of protection, especially to new development. These measures include, but are not limited, to zoning, subdivision, and building requirements, as well as mitigation and emergency preparedness plans. Through its participation in the CRS, Lewes is committed to adoption and enforcement of activities that result in a higher level of safety and protection for its citizens, with the additional benefit of economic cost savings via reduced federal flood insurance premiums.

Project Goals, Objectives, and Content

Like many coastal communities, the City of Lewes is looking to determine the best way to address increases in flood and storm damage that are expected to come with increased storm surge and rising sea levels. While the NFIP and CRS programs have been shown to provide an effective incentive to implement and maintain risk reduction activities, current floodplain management practices may be insufficient to address future flood risk because they do not account for changing climate conditions.

This technical report documents an evaluation of the City's current floodplain management and includes specific recommendations for measures to reduce future flood risk and increase the City's CRS classification to benefit both private property owners and the community as a whole.

The report is organized in several sections and includes appendices that provide further details about the project and resulting recommendations.

- Section 1 focuses on providing a framework for this effort, including an overview of Lewes's standing in the NFIP, a statewide synopsis of the NFIP and other CRS

communities, and the context through which the City could consider report recommendations.

- Section 2 provides a detailed review of Lewes' current CRS activities, as well as suggestions for improving its standing in the CRS program.
- Section 3 outlines recommendations for (1) coordinating codes and floodplain management regulations; (2) possible changes to building codes as well as building department procedures and outreach; and (3) recommendations for integrating report findings into hazard mitigation planning efforts.

The appendices contain the technical review and summary of existing City regulations and documents to identify duplication, inconsistencies, opportunities, and recommendations.

- Appendix A contains detailed notes on the City's building, zoning, and subdivision codes, as well as the City's Building Permit Application form, Comprehensive Plan (2005), Hazard Mitigation and Climate Adaptation Action Plan (June 2011), and the City of Lewes website.
- Appendix B includes review of and resulting recommendations from two background documents (ASFPM's *No Adverse Impact Handboo*k (2007) and The Georgetown Climate Center's *Zoning for Sea Level Rise* (2012).
- Appendix C provides a detailed summary of the City's existing CRS activities that should be examined for possible additional points and the additional new activities identified in this report for consideration.

Conclusion

The evaluation is intended to be used by the City Council and City staff to guide the City's consideration of specific activities that may be undertaken, and specific regulations that may be modified, to achieve the City's specific objectives related to reducing vulnerability to flooding and qualifying for higher discounts on federal flood insurance. While many recommendations are identified, only the City can determine whether, given its understanding of vulnerabilities to coastal flood and sea level rise, any specific recommendation is consistent with its goals, is legally feasible, and whether the City has the capacity to implement specific activities and regulatory requirements.

1 INTRODUCTION

1.1 Objectives

This technical report is intended to be used by the City Council, City staff, and City commissions and committees to guide the City's consideration of specific activities that may be undertaken, and specific regulations that may be modified, to the following objectives:

1. Reduce vulnerability and damage to flooding
2. Recognize increased vulnerability due to sea level rise
3. Improve eligibility for Community Rating System (CRS) credits to qualify for higher discounts on National Flood Insurance Program (NFIP) flood insurance premiums.

This evaluation is based on reviews of existing reports, regulations, plans, and documents. The recommendations for activities and regulations the City should consider are based those reviews and the opinions of the authors. The evaluation is not a position paper on sea level rise or climate change, but does take into consideration activities and regulations that may, over time, address some of the anticipated effects of sea level rise and climate change.

1.2 Tasks

The City uses a number of planning and regulatory tools to guide development. In general, comprehensive plans, zoning, and subdivision rules are used to determine what to build and where to build. After those decisions, floodplain management regulations and building code requirements govern how buildings and structures are designed. This project evaluated the City's tools pertinent to floodplain management. Specifically, the scope of work called for:

1. Evaluation of existing floodplain management regulations, building codes, zoning ordinance, subdivision regulations, building permit application, comprehensive plan, and hazard mitigation plan to identify duplication, inconsistencies, and opportunities to address anticipated problems associated with increasing vulnerabilities to coastal flood and sea level rise.
2. Review of available CRS information to identify opportunities to increase points, whether in existing regulations and codes or by undertaking new activities.

1.3 Changes in Effective and Preliminary Flood Insurance Rate Maps

The City's current effective Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are dated January 6, 2005. FEMA is preparing a revised study and FIRMs. The Sussex County Preliminary FIRMs are online at www.dnrec.delaware.gov/swc/drainage/pages/flooding.aspx.

In late 2014 FEMA will set the effective date of the revised flood hazard information (expected to be early 2015). A detailed comparison of the current effective FIRM and revised FIRM has not been prepared. Based only on visual comparison, Base Flood Elevations (BFEs) in coastal high hazard areas (Zone V) will be reduced by 1 foot (see Figure 1). In terms of areal extent, the most significant changes appear to be relatively minor changes related to using better topography (see Figure 2 and Figure 3). An analysis of the digital map data prepared by the University of Delaware's Institute for Public Administration yields the following:

	2005 FIRM	Preliminary 2014 FIRM*	Differences
Structures (from 911) and Vacant Parcels			
➢ In Zone AE	822 structures 74 vacant parcels	736 structures 103 vacant parcels	Reduce 86 structures Increase 29 parcels
➢ In Shaded Zone X (500-yr)	119 structures 65 vacant parcels	168 structures 30 vacant parcels	Increase 52 structures Reduce 35 parcels
Land area			
➢ In Zone VE	395 acres	373 acres	Reduce 22 acres
➢ In Zone AE	183 acres	156 acres	Reduce 27 acres
➢ In Shaded Zone X (500-yr)	1,419 acres	1,425 acres	Increase 6 acres
➢ In Unshaded Zone X	883 acres	903 acres	Increase 20 acres

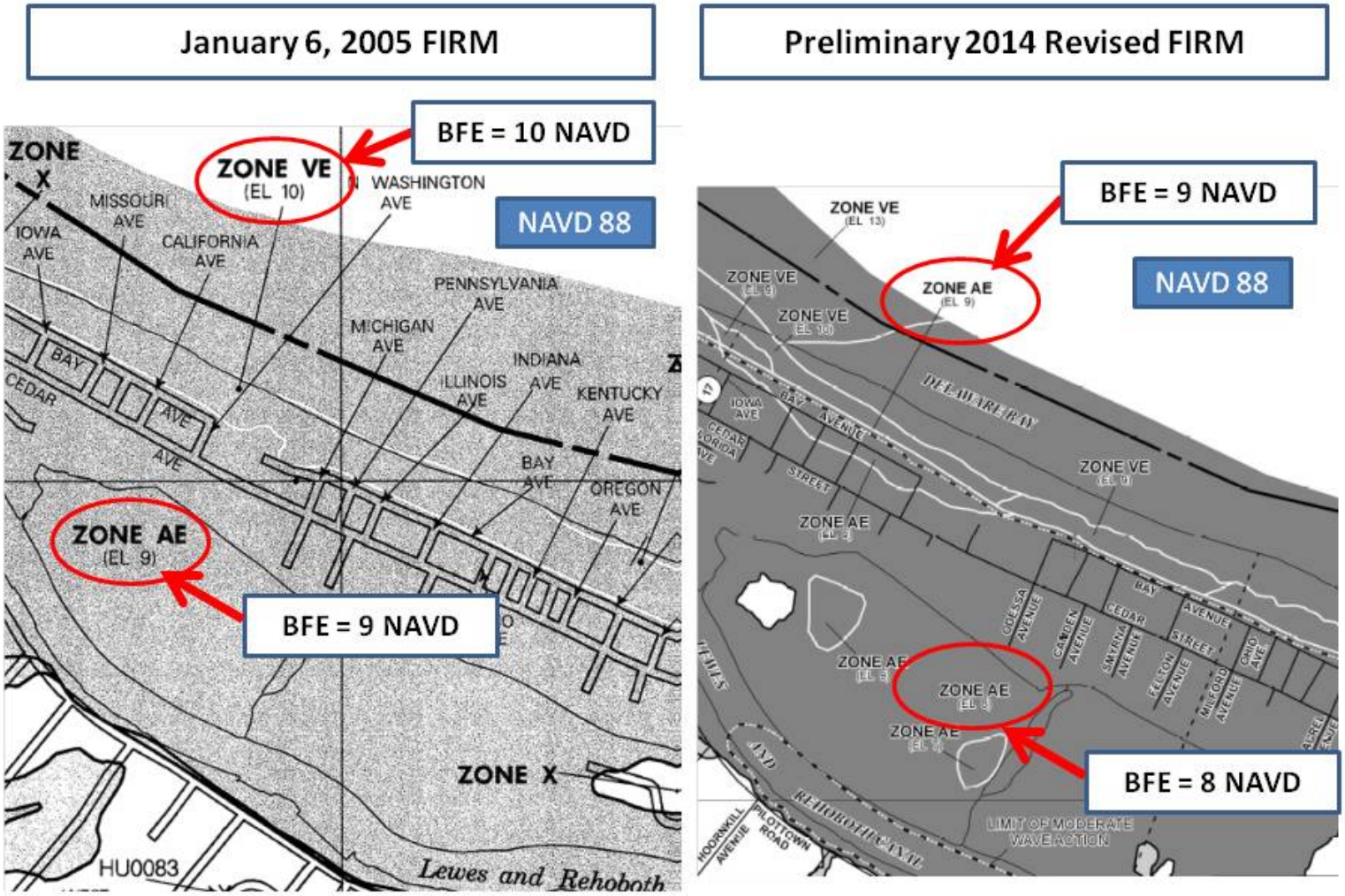
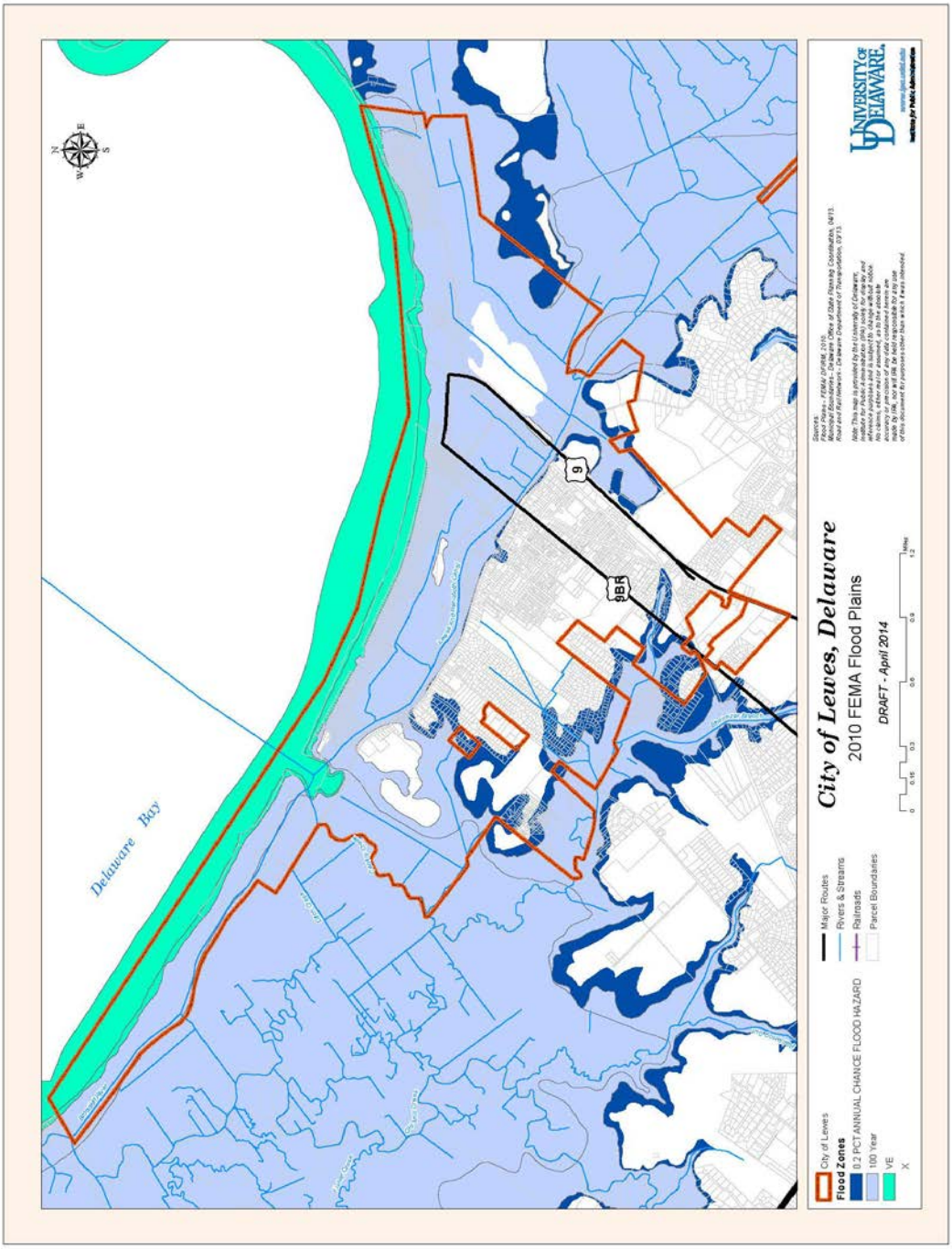


Figure 1. Comparison of Base Flood Elevations for 2005 FIRM and Preliminary 2014 FIRM FIRM


Delaware Bay
City of Lewes, Delaware
2010 FEMA Flood Plains
DRAFT - April 2014
City of Lewes
Flood Zones
0.2 PCT ANNUAL CHANCE FLOOD HAZARD
100 Year
VE
X
Major Routes
Rivers & Streams
Railroads
Parcel Boundaries
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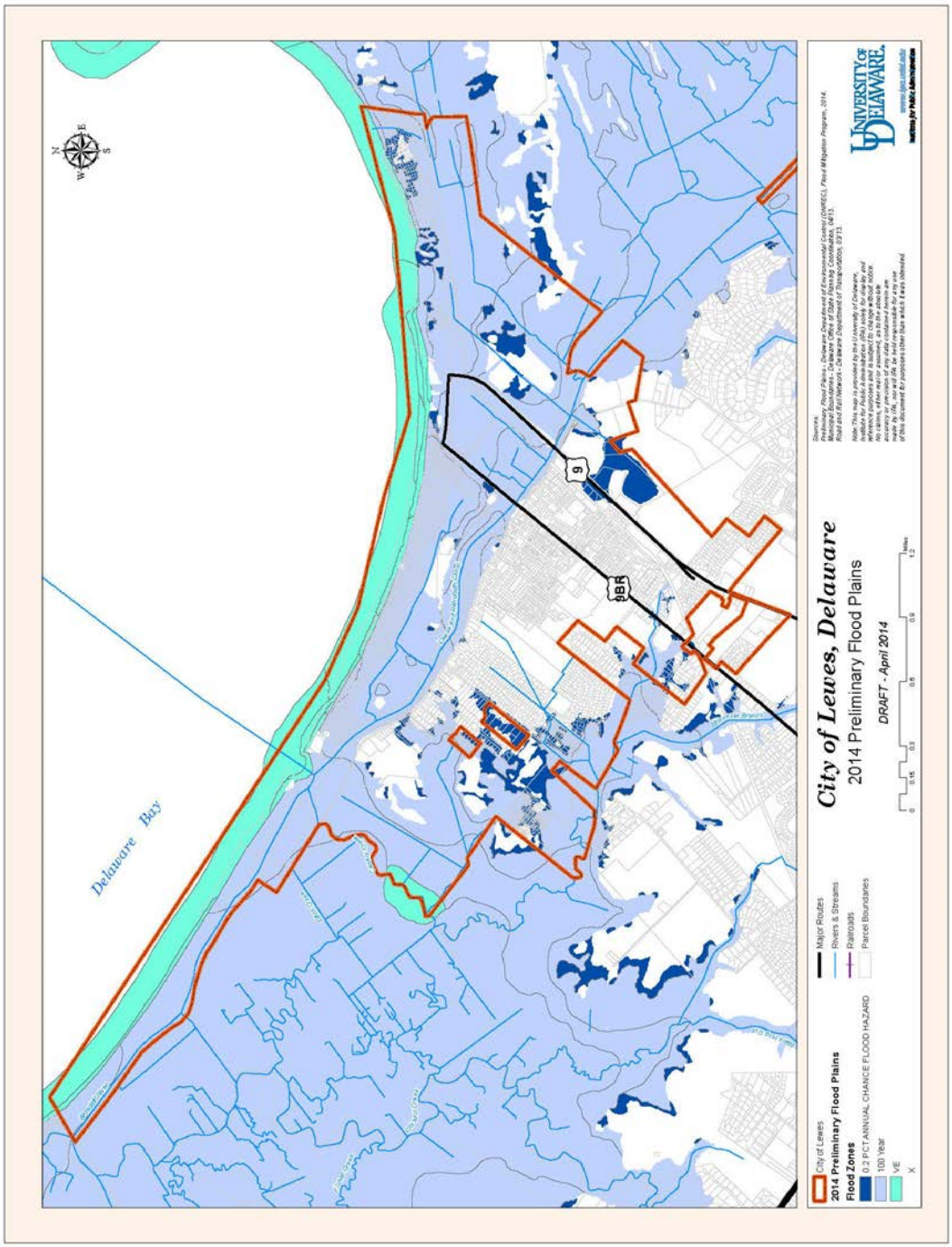
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1.4 Sea Level Rise

For planning purposes, the Delaware Department of Natural Resources and Environmental uses a range of future sea level rise under "low and high emissions scenarios" of between 1.6 ft and 4.9 ft by the year 2100.

The BFEs that FEMA will show on the revised FIRM are going down by 1 ft. Therefore, the BFEs on the 2005 FIRM almost illustrate the lower end of the range of sea level rise anticipated by the year 2100.

The 2005 Flood Insurance Study indicates the 500-year stillwater elevation for Delaware Bay from the Kent/Sussex boundary to Cape Henlopen is 10.5 ft (NAVD88) (ref. 2005 Sussex County FIS, Table 3). This elevation is 3 feet higher than the 100-year stillwater elevation (shown as 8.5 ft). The actual water surface elevation for the 500-year flood is likely higher because of added wave height. The FIRM shows the additional area predicted to be inundated by the 500-year flood as "shaded X zone." Regulating this slightly larger area – as opposed to the 100-year flood hazard area -- could account for at least some of the effects of sea level rise, not just by additional elevation but also additional area predicted to be subject to flooding in the future.

1.5 NFIP and the Community Rating System (CRS)

The NFIP. The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as protection against flood losses, in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces adequate floodplain management regulations, thus recognizing flood hazards in their planning, zoning, development, and construction decisions, FEMA will make flood insurance available within the community.

The CRS. Many communities have chosen to guide development toward areas of lower risk, and new buildings are often located out of harm's way. The NFIP requirements govern how development occurs, rather than explicitly guiding development away from flood-risk areas. Until 1990, the NFIP had few incentives for communities to do more than administer the minimum NFIP requirements, and flood insurance rates were the same in every community, yet some elected to exceed the minimum requirements. The CRS was established to recognize that many communities elect to exceed the minimum requirements. In communities that participate in the CRS, flood insurance premiums are discounted to reflect community initiatives that meet the following CRS goals:

1. Reduce and avoid flood damage to insurable property
2. Strengthen and support the insurance aspects of the NFIP
3. Foster comprehensive floodplain management

Discounted NFIP flood insurance premiums are only one of the rewards that communities gain by undertaking activities credited by the CRS. Other benefits include improved public safety, reduced damage to property and public infrastructure, avoidance of economic disruption and

losses, reduction of human suffering, protection of the environment and, most importantly, promotion of disaster-resistant communities.

The amount of flood insurance premium discount is based on a community's CRS classification, which in turn is based on the total credit for the community's activities. Class 1 communities qualify for the maximum discount of 45 percent for policies on buildings in the Special Flood Hazard areas (SFHA) (and 10 percent on buildings not in the SFHA). Class 9 communities receive a 5 percent discount on all policies. Class 10 communities receive no discount either because they do not achieve the minimum number of credits for Class 9 or they do not apply for the CRS. In order to be a Class 6 or better, communities must have received a classification of 5 (commercial) and 5 (residential) or better under the Building Code Effectiveness Grading Schedule (BCEGS).

1.6 Delaware and the NFIP and CRS

Delaware's three counties and 48 municipalities are identified by FEMA as having some degree of flood risk, represented by publication of Flood Insurance Studies and Flood Insurance Rate Maps. All but two of the 48 municipalities have elected to adopt and enforce floodplain management regulations in order to participate in the NFIP.

As of December 31, 2013, there were 26,207 NFIP flood insurance policies in force in the State and 4,262 flood insurance claims had been paid since 1978, for a total of more than $77 million in claim payments statewide.

New Castle County and 10 municipalities participate in the CRS. Nearly 9,500 NFIP flood insurance policies are in force in those communities and participation in the CRS yields an annual savings of approximately $662,000.

The City of Lewes has joined other CRS communities to form the Delaware CRS Users Group. In subsequent sections of this report notes on a number of CRS activities indicate differences between the number of points Lewes receives and points some other Sussex County communities receive. The CRS Users Group is a good forum for comparing activities and learning from each other. CRS Communities in Sussex County include:

- Bethany Beach, CRS Class 8
- Dewey Beach, CRS Class 8
- Fenwick Island, CRS Class 8
- Lewes, CRS Class 9
- Rehoboth Beach, CRS Class 8
- Seaford, CRS Class 9
- South Bethany, CRS Class 8

1.6 Lewes and the NFIP and CRS

The City of Lewes was accepted into the NFIP on March 15, 1977. As of December 31, 2013, there were 1,042 NFIP flood insurance policies in force in the City and 72 claims had been paid since 1978 for a total of $620,200 is payments.

The City joined the CRS on October 1, 1992 as a Class 9 community. As of October 2013, the City of Lewes remains a Class 9 community.

As scored in 2011 using the 2007 CRS Coordinator's Manual, the City's activities are credited with a total of 900 points. A total of 1,000 credit points is needed to be a Class 8 (providing 10% discount on policies in the mapped special flood hazard area (SFHA) and 5% discount on policies outside of the SFHA). Thus, Lewes needs an additional 100 points to qualify for Class 8.

DNREC used a FEMA tool to show the financial benefits of improving the City's CRS classification (Table 1). The data in this table are based on current premiums paid (not anticipating premium increases due to phase in over time, as required by the Biggert-Waters Act of 2012). Lewes is current a CRS Class 9, and flood insurance policyholders receive a total annual discount of $41,510. Individual policyholders with property located in the Special Flood Hazard Area (SFHA) receive a 5% discount; properties outside of the SFHA (column identified as "X-STD") receive a 5% discount. Preferred Risk Policies (PRP) do not get a discount.

If the City was a Class 8, policyholders would receive a total annual discount of $78,288. Individual policyholders with property located in the Special Flood Hazard Area (SFHA) would receive a 10% discount; properties outside of the SFHA (column identified as "X-STD") would receive a 5% discount.

Because the savings are a function of the paid premium, the total savings will increase as premiums increase. Premiums on various classes of property are scheduled to increase significantly over the next several years. For more information on the impact of the Biggert-Waters Act of 2012, go to www.FEMA.gov/BW12.

Table 1. City of Lewes: CRS Savings Scenarios
(Source: FEMA, provided by DNREC November 11, 2013)

		TOTAL	SFHA *	X-STD/ AR/A99 **	PRP ***
	Policies in Force➔	1,050	703	108	239
	Total Premium➔	$899,258	$698,775	$89,919	$110,564
CRS CLASS🡻	Ave Premium➔	$856	$994	$833	$463
9 (current)	Ave. Per Policy	$40	$52	$44	$0
	Per Community	$41,510	$36,777	$4,733	$0
8	Ave Per Policy	$75	$105	$44	$0
	Per Community	$78,288	$73,556	$4,733	$0
7	Ave. Per Policy	$110	$157	$44	$0
	Per Community	$115,066	$110,333	$4,733	$0
6	Ave Per Policy	$149	$209	$88	$0
	Per Community	$156,576	$147,110	$9,465	$0

* SHFA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class.

** SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO): 10% discount for Classes 1-6; 5% discount for Classes 7-9.

*** Preferred Risk Policies are not eligible for CRS Premium Discounts.

1.7 Current CRS Activities and Credit Points

The City's current CRS activities and credit points are shown in the table below. The credit points are based on the 2007 schedule of activities and points.

The 2013 CRS schedule has some changes. Lewes will retain its previously verified credit points until the next verification visit after publication of the 2013 CRS Coordinator's Manual or until the City submits documentation for additional activities, at which time translating the points to the 2013 schedule will be done by FEMA's contractor. A detailed breakdown of the points associated with each activity is in Appendix C, which also identifies the additional activities identified in this report for consideration and the existing activities that need to be examined for possible additional points.

Table 2. City of Lewes – CRS Credit Points (Source: FEMA, October 20, 2011, results of CRS verification findings)		
Activity	**2007 Max Points**	**Lewes Points**
300 Public Information Activities		
310 Elevation Certificates	162	50
320 Map Information Service	140	140
330 Outreach Projects	380	71
340 Hazard Disclosure	81	15
350 Flood Protection Information	102	50
360 Flood Protection Assistance	72	
400 Mapping and Regulatory Activities		
410 Additional Flood Data	1,246	
420 Open-Space Preservation	900	140
430 Higher Regulatory Standards	2,740	163
440 Flood Data Maintenance	239	
450 Stormwater Management	670	256
500 Flood Damage Reduction Activities		
510 Floodplain Mgnt Planning	359	
520 Acquisition and Relocation	3,200	
530 Flood Protection	2,800	
540 Drainage System Maintenance	330	15
600 Flood Preparedness Activities		
610 Flood Warning Program	255	
620 Levee Safety	900	
630 Dam Safety	175	
	Lewes Total	**900**

1.8 Community Consideration of Recommendations

The City must determine whether, given its understanding of vulnerabilities to coastal flood and sea level rise, any specific recommendation is consistent with its goals, is legally feasible, and whether the City has the capacity to implement specific activities and regulatory requirements.

Section 2.0 summarizes identified CRS activities and other recommendations. The origins of the recommendations can be identified in Appendix A and Appendix B. Appendix A contains detailed notes on the City's regulations, documents, and plans paired with recommendations and CRS activities. Similarly, Appendix B contains detailed notes on the ASFPM *Coastal No Adverse Impact Handbook* and *Zoning for Sea Level Rise* by the Georgetown Climate Center.

Appendix C identifies the City's existing CRS activities that need to be examined for possible additional points and the additional new activities identified in this report for consideration.

1.9 List of Acronyms

General Acronyms

ASCE – American Society of Civil Engineers
ASFPM – Association of State Floodplain Managers
BFE – Base Flood Elevation
CRS – Community Rating System
DNREC – Delaware Department of Natural Resources and Environmental Control
EC – FEMA Elevation Certificate
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map
FIS – Flood Insurance Study
HM&CAAP – Lewes Hazard Mitigation and Climate Adaptation Action Plan
IBC – International Building Code
IEBC – International Existing Building Code
IFGC – International Fuel Gas Code
IMC – International Mechanical Code
IPC – International Plumbing Code
IRC – International Residential Code
NAVD – North American Vertical Datum of 1988
NFIP – National Flood Insurance Program
SFHA – Special Flood Hazard Area
SI/SD – Substantial Improvement / Substantial Damage
SLR – Sea Level Rise

CRS Activity Acronyms

BC – Building Code
BMM – Benchmark Maintenance
CAZ – Coastal A Zone
CDR – Drainage System Maintenance, debris removal
CSI – Cumulative Substantial Improvement
DL1 – Development Limitations, prohibition on fill
DL – Development Limitations
ENL – Enclosure Limits
ESC – Erosion and Sediment Control
EWD – Emergency Warning Dissemination
FDN – Foundation Protection
FM – FIRM Maintenance
FPA – Flood Protection Assistance
FPM – Floodplain Management Planning
FRB – Freeboard
FRO – Flood Response Operations
FRP – Flood Response Preparations
LDP – Local Drainage Protection

LiMWA – Limit of Moderate Wave Action
LSI – Lower Substantial Improvement
LZ – Land Development, Low Density Zoning
MI – Map Information
OPS – Outreach Projects Strategy
ORS – Off-site Record Storage
PCF – Protection of Critical Facilities
PFI – Promotion of Flood Insurance
PPI – Program for Public Information
RA – Regulations Administration
RA1 – Regulations Administration, staff training
SCR – StormReady Community
SMR – Stormwater Management Regulations
STF – Staff Qualification
STK – Stakeholder Delivery
WEB – Flood Protection Website

2 LEWES, DELAWARE: CRS ACTIVITIES AND RECOMMENDATIONS

This section summarizes identified recommended CRS activities (and available CRS points and whether the City receives points) and other recommendations for the City of Lewes.

- Appendix A contains detailed notes on the City's regulations, documents, and plans paired with recommendations and CRS activities; these documents are the origins of the recommendations.
- Appendix B contains detailed notes on the ASFPM *Coastal No Adverse Impact Handbook* and *Zoning for Sea Level Rise* by the Georgetown Climate Center.
- Appendix C summarizes and identifies the City's existing CRS activities that need to be examined for possible additional points and the additional new activities identified in this report for consideration.

2.1 CRS: 300 Public Informational Activities

- CRS 310 Elevation Certificates (ORS) – moved to (RA) in 2013 Manual: 5 points for keeping ECs and other records in "safe and secure site" (specifically defined in the manual). City receives no points.
- CRS 320 Map Information Service (2013 new MI elements): Maximum credit is 90 points (City currently get 140 pts; activities have changed).
- CRS 330 Outreach Projects Strategy (OPS): See 2013 manual for replacement activities (PPI, FRP and STK): if developed according to 2013 CRS Guidance, may qualify for up to 380 points (City currently get 71 points); most points are provided if developed by an "outreach strategy team," which could be an assignment made by council to an existing committee. H. Baynum advises some outreach effort every year, newsletter to SFHA properties (not whole city); State does hurricane awareness week and City piggybacks on that effort.
- CRS 330 Promotion of Flood Insurance (PFI): 2007 up to 65 points, but see 2013 370 Flood Insurance Promotion (up to 110 points). City receives no points.
- CRS 350 Flood Protection Website (WEB): 2013 points increased to 76, and the requirements have changed. City gets 31 points out of 72. Review web content compared to the 2013 CRS criteria to determine if revisions are necessary to qualify for more points. If a community's website does not have a search tool, the flood information needs to be linked from the front page.
- CRS 360 Flood Protection Assistance (FPA): 2007 up to 71 points, but infrequency of actual flooding may not warrant developing capabilities to implement. 2013 changes points and subactivities. City receives no points.
- CRS 300 (no existing activity identified in CRS Manual): Use depth grid (product of map revision) to develop estimates of depths and provide to inquirers along with zone and BFE information.

2.2 CRS: 400 Mapping and Regulations

- CRS 430 Higher Regulatory Standard (BC): Lewes gets 30 CRS points for building code adoption (BC). This number of points may be low due to (a) the City using the 2003 editions, or (b) the "utility codes" are not explicitly adopted (International Mechanical Code, International Plumbing Code, International Fuel Gas Code) are not explicitly adopted. These points are in jeopardy if adoption of the 2012 I-Codes is not done before the next verification.
- CRS 430 Higher Regulatory Standard (CSI): Lewes gets 77 points for cumulative substantial improvement (CSI) provided in 197-73.
- CRS 430 Higher Regulatory Standard (LSI): Up to 90 points (2013 is 20 points) for lowering the threshold below 50%. (Nationwide, only 56 out of 1192 CRS communities get points for LSI.)
- CRS 430 Higher Regulatory Standard (no existing activity): Include in definition of substantial damage the NFIP definition of "repetitive loss by flood" (also qualifies for NFIP ICC claim payment to be used to bring buildings into compliance with flood requirements).
- CRS 430 Higher Regulatory Standard (STF): Up to 50 points for staff qualification (not required to be in regulations, should be in position descriptions for Building Official, Plan Reviewer, Inspector, etc.). City receives no points. (See 2013, moved to Regulations Administration, RA.)
- CRS 430 Higher Regulatory Standard (RA1): 2013 Manual, Regulations Administration, points for CFM, graduation from FEMA classes. City receives no points.
- CRS 430 Higher Regulatory Standard (ENL): Also see notes on higher standards for enclosures at Sec. 197-73. CRS points are available for Nonconversion Agreements for enclosures below elevated buildings (additional points if recorded and provides for inspection). A model agreement developed by Florida provided to H. Baynum (needs to be modified to provide for future inspection, if maximum points are desired). City receives no points.
- CRS 430LD Land Development Criteria (LZ): 2013 Manual shows up to 600 points if zoning identifies different densities for different areas. Potential for points may be small because of small percentage of SFHA that is available for development. City receives no points.
- CRS 430 Freeboard (FRB): Freeboard above that specified in IBC, IRC (2015 IRC will have BFE + 1 ft all zones). City receives no points. However, because the BFEs go down on the revised FIRM, BFE + 1 ft essentially results in the same height above ground requirement based on the 2005 FIRM. See Figure 2. H. Baynum advises most buildings have lowest floors higher than BFE + 18" in order to have sufficient headroom underneath for parking and storage.

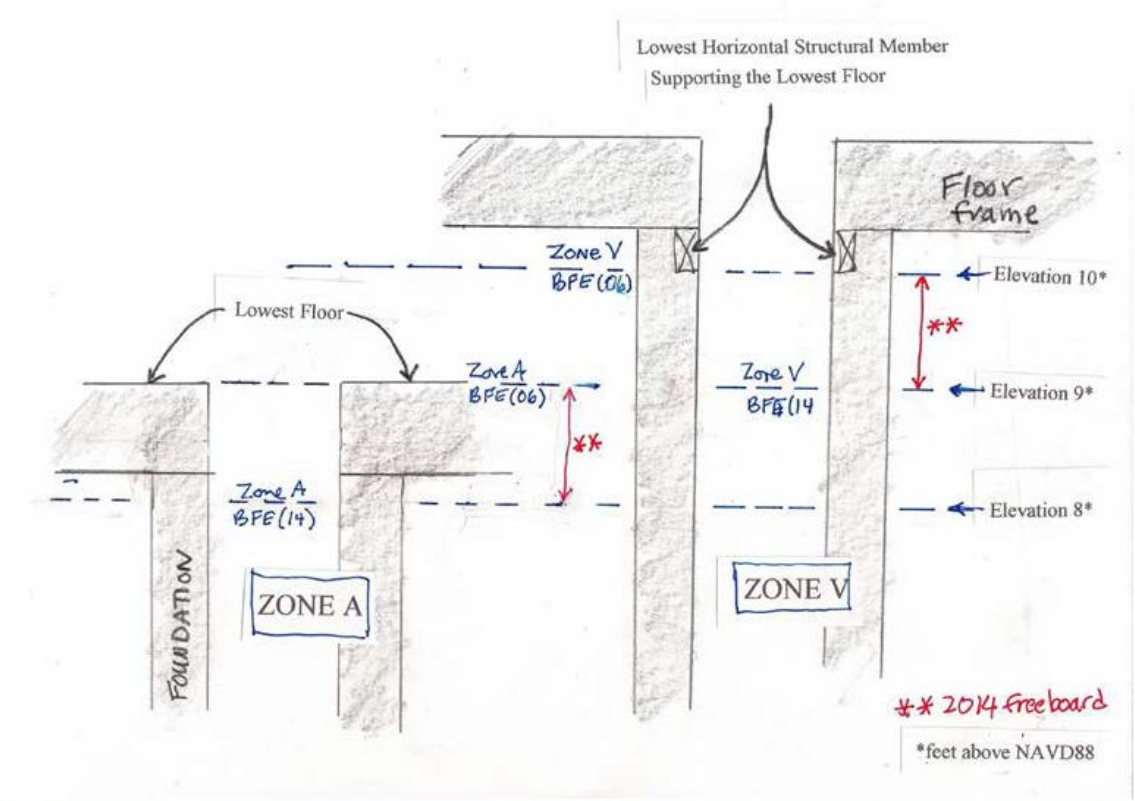

Figure 2. Comparing Flood and Building Elevations Comparison of Base Flood Elevations for 2005 FIRM and Preliminary 2014 FIRM

- CRS 430 Foundation protection (FDN): Require engineered foundation in all flood zones (2007 up to 35 points; 2013 up to 80 points, but requires pairing with other limitations).
- CRS 430 Protection of Critical Facilities (PCF): Critical facilities (2007 up to 100 points; 2013 up to 80 points). City receives no points.
- CRS 430 Enclosure limits (ENL): Enclosures (e.g., limit size, prohibit, nonconversion agreement, no partitions); (2007 up to 300 points; 2013 up to 240 points). City receives no points.
- CRS 430 Coastal A Zones (CAZ): When the LiMWA is shown on the 2015 FIRM, treat CAZ like Zone V (already in IBC by reference to ASCE 24; will be in 2015 IRC). The LiMWA delineated by FEMA will be just slightly landward of the Zone V boundary. Consider designating additional land landward of the LiMWA as Coastal A Zone (e.g., seaward of the centerline of Bay Avenue, the centerline of Cedar Street, or a specific number of feet landward of the Zone V boundary). (2007 and 2013 up to 650 points, but with limitations and adjusted by ratio of area designated CAZ to entire SFHA/Zone AE). City receives no points.
- CRS 430 Local drainage protection (LDP new 2013): Local drainage protection, up to 120 points for requiring minimum elevation above grade, even in shaded and unshaded Zone X.

Some credit available if enforce IBC & IRC requirements for positive drainage away from foundations. City receives no points.

- CRS 430 (no existing activity): Require new buildings in specific areas (Zone V or seaward of the canal) to be designed and constructed to be "readily moveable" (Michigan has similar provision for buildings within erosion planning zones on Great Lake bluffs).
- CRS 430 Protection of Critical Facility (PCF): 2013 up to 80 points available for prohibiting critical facilities in SFHA or regulating to 500-year flood elevation; but no points if SFHA is zoned such that critical facilities wouldn't be allowed anyway. City receives no points.
- CRS 432 Development limitations (DL); prohibition on fill (DL1): 2013 up to 280 pts if regulations explicitly do not allow fill to elevate homes in Zone A/AE (and positively affects freeboard points). City receives no points.
- CRS 450 Stormwater Management Regulations, (SMR): Delaware's available statewide credit 124-224 points; City gets 140 points
- CRS 450 Erosion and Sediment Control (ESC): Available statewide credit 30 points.
- CRS 440 Benchmark maintenance (BMM): 2007 up to 90 points (unclear how many benchmarks are in city limits). 2013 will be 27 points. City receives no points.
- CRS 440 FIRM maintenance (FM): 2007 up to 20 points; 2013 up to 15 points. Most points if maintain copies of all previous FIRMs (and FIS), including LOMRs, are retained. City receives no points.

2.3 CRS: 500 Flood Damage Reduction Activities

- CRS 510 Floodplain Management Planning (FPM): 2007 up to 359 points; 2013 is 382 points. Manual states "Hazard mitigation plans prepared to qualify for FEMA's hazard mitigation grants that are accepted by FEMA will receive some credit under this activity." . Number of points is a function of the planning process used. Verify the 2010 Sussex County plan was approved by FEMA. Review the requirements and documentation described in the 2013 CRS Manual to determine if the City should submit both the 2010 plan and the 2011 climate action supplement to ISO. [In 2012, Sussex municipalities that receive FPM points are Bethany Beach (64 pts) and South Bethany (74 pts), while Dewey Fenwick Island, Lewes, Rehoboth Beach, and Seaford do not receive points.]
- CRS 540 Drainage System Maintenance, debris removal (CDR): 2007 up to 300 points for inspecting drainage and removing debris (would need to keep records to document performance of inspections). 2013 reduces to maximum of 200 points. The City gets no points now, but may be able to get points for maintenance by the Highland Acres Tax Ditch Authority. [In 2012, Bethany Beach, Dewey Beach, Fenwick Island, and South Bethany each got 200 pts.]

2.4 CRS: 600 Warning and Response

- CRS 610 StormReady community (SRC): 2007 25-30 points, if also get FTR credit (flood threat recognition system, up to 40 points). 2013 some changes in points. [In 2012, Bethany Beach, Fenwick Island, and South Bethany each got 75 pts; City gets no points.]

- CRS 610 Emergency warning dissemination (EWD): 2007 up to 60 points. Does city cooperate with county? 2013 up to 75 points. [In 2012, Fenwick Island (69 pts) and South Bethany (38 pts); City gets no points.]
- CRS 610 Flood response operations (FRO): 2013 up to 115 points. [In 2012, Fenwick Island and South Bethany each got 23 pts; City gets no points.]

3 RECOMMENDATIONS FOR BUILDING CODES, FLOOD REGULATIONS, PROCEDURES, AND PLANNING

3.1 Coordinating Codes and Floodplain Management Regulations

Once FEMA establishes the effective date of the revised FIS and FIRM, the City will have 6 months to demonstrate that its codes and regulations meet or exceed the minimum requirements of the NFIP. Prior approval by FEMA or DNREC (implicit or explicit) is not sufficient. As noted elsewhere, Section 197-73 does not satisfy the requirement.

FEMA has determined that the flood provisions of the I-Codes (2009 and later) satisfy the requirements for buildings and structures. Relying on the flood provisions of the building code instead of two sets of rules that govern the same thing is easier for design professionals and developers. It will also be easier for City staff to have a single set of requirements that apply to the design and construction of buildings in flood hazard areas. Requirements for other development and some administrative provisions would be included in companion in floodplain management regulations that are explicitly written to work with the building code. This option involves replacing Section 197-73 with a code-coordinated ordinance (DNREC is preparing a model code-coordinated ordinance to accomplish this).

- Recommendation: Rather than administer both the codes and Sec. 197-73, the City should repeal Sec. 197-73 and adopt replacement code-coordinated regulations. This should be done concurrent with adoption of amendments to the building codes to retain the City's existing higher standards and to incorporate any new higher standards that are determined appropriate after evaluation of the recommendations in this report. The City should either repeal adoption of IBC Appendix G or not adopt it when the next edition of the codes is adopted.

3.2 Other Recommendations for Building Code and Flood Regulations

- Recommendation: Have a single set of provisions for administration of the building codes. Consider retaining IBC Chapter 1 and modifying it to incorporate provisions from IRC Chapter 1, City-specific requirements in Chapter 70, and specific requirements from Chapter 90 for dwellings.
- Recommendation: The FIS and FIRMs need to be specifically adopted (Sec. 70-1(B) and (C)). See DNREC model ordinance.
- Recommendation: Add a cross reference to the specific variance criteria in 197-73 for historic structures in SFHA (Sec. 197-59).
- Recommendation: Clarify procedures so that key records related to flood are retained permanently (Sec. 70-10).
- Recommendation: If the City decides to modify any requirement based on sea level rise rationale, it should add to the variance considerations required to obtain variances in SFHA (Sec. 197-92).

3.3 Recommendations for Building Department Procedures & Outreach

- Recommendation: H. Baynum observed that some homes built after adoption of flood regulations do not have exterior equipment at the same elevation as the lowest floor. Elevation Certificates could be reviewed to verify this observation. It is likely that flood insurance policies on these homes are more expensive than if the equipment was at the same elevation. The 2012 I-Codes explicitly require equipment to be at the same elevation. The City may want to inform property owners that they may qualify for lower flood insurance premiums if they raise the equipment to or above the elevated floor. Whether an inspection or verification letter from the City would suffice or a new EC would be required is not clear (RCQ has asked FEMA).
- Recommendation: Handle requests for improvement and repair of historic structures in the SFHA by variance (i.e., remove the exclusion from the definition for Substantial Improvement). Because variances are to be the minimum necessary, applicants would have to consider elevation and other measures that minimize exposure to future flooding.
- Recommendation: Review FEMA P-758, SI/SD Desk References and:
    - Consider using the materials in Appendix D and sample letters in Appendix E
    - Use consistent method/approach to determine "market value" (Section 4.7)
- Recommendation: Modify the application forms to add identification of flood zone, flood zone boundaries, LiMWA, BFE and FIRM panel.
- Recommendation: Prepare the Building Department to respond to large-scale flood event, although NFIP claims records suggest little past flooding (72 claims paid since 1978):
    - Post-flood inspections to screen for SD
    - See FEMA P-758, sunny-day photos (if not already in assessment records)
    - Draft policy regarding permit fees for repair, demolition
- Recommendation: Determine if any private land (with or without existing buildings) is within CBRS/OPA. If there are any, consider informing owners of limitations on flood insurance (can still build).

3.4 Recommendations for Hazard Mitigation Planning

- Recommendation: Re-run the analysis of number of structures in SFHA with revised FIRM, although unlikely to change the numbers much. The BFEs go down; based only on visual comparison, most significant changes to SFHA boundary appear to be on the west side of the city and related to using better topography. See Figure 2 and Figure 3 in Section 1.3.
- Recommendation: For the 2015 update of the Sussex County hazard mitigation plan, consolidate strategies from both plans. In addition, rather than have two separate but very similar mitigation plans, either:
    - Incorporate content from the HM&CAAP into those portions of the multi-jurisdictional plan that pertain to the City so that the 2015 update formally supersedes the HM&CAAP, or
    - Include the HM&CAAP as an appendix to the multi-jurisdictional plan.

- Recommendation: If homeowners are interested, the City could pursue additional funds to elevate, relocate (FEMA grants, ICC, city funds/loans). Not necessary to wait until damage occurs (although owners are likely to be more inclined to participate and it can make it easier to get projects approved).

APPENDIX A. LEWES, DE: REVIEW OF CITY REGULATIONS AND DOCUMENTS

Selected regulations and documents were reviewed to identify inconsistencies and possible recommendations:

- Chapter 70, Building Construction
- Chapter 170, Subdivision and Land Development
- Chapter 197, Zoning
- Building Permit Application Form
- Comprehensive Plan (October 2005)
- Hazard Mitigation and Climate Adaptation Action Plan (June 2011)
- City Webpage

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
A.1 Chapter 70, Building Construction	
70-1(A). Adopts the 2003 IBC and 2003 IRC; for both, adopts "all subsequent editions" • FEMA deems the flood provisions of the 2009 and 2012 I-Codes to be consistent with the NFIP. • The Sec. 1612.4 refers to ASCE 24, which contains the technical provisions applicable to buildings and structures in flood hazard areas. • ASCE 24 contains some provisions that exceed the minimum requirements of the NFIP • FEMA provides excerpts of the flood provisions and a	• Despite the phrasing "all subsequent editions," H. Baynum advises the effective edition is 2003 and that the City expects to adopt the complete set of 2012 I-Codes in a few months. • The IMC and IFGC are not considered adopted by reference. • Plumbing permits issued by City's Board of Public Works. The BPW follows State regulations and the State uses the 2012 IPC, with amendments. • The scope of the IRC includes work that can only be performed on existing dwellings. The City applies the provisions of the IRC to existing dwellings. See comments on Sec. 70-5.

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
checklist that demonstrates consistency are available on the "Building Code Resources" webpage (link below) • FEMA's paper summarizing the higher standards in the I-Codes and ASCE 24 (link below) http://www.fema.gov/building-science/building-code-resources	• The conflict statement is specific that the I-Codes and Sec. 197-73 (Floodplain District Regulations) govern in the event of conflict with Chapter 70, but leaves unresolved conflicts between the I-Codes and Sec. 197-73. H. Baynum advises that the more restrictive concept always applies. • H. Baynum advises that differences between the flood provisions of the codes and ASCE 24 and Sec. 197-73 are resolved on a case-by-case basis. • Many of the administrative provision in Chapter 70 are similar to the provisions in Chapter 1 of IBC and IRC, but there are differences. Normally, the administrative provisions of the codes are used; the more restrictive would prevail. • Recommendation: Have a single set of provisions for administration of the building codes. Consider retaining IBC Chapter 1 and modifying it to incorporate provisions from IRC Chapter 1, City-specific requirements in Chapter 70, and specific requirements from Chapter 90 for dwellings. • CRS 430 Higher Regulatory Standard (BC): Lewes gets 30 CRS points for building code adoption (BC). This number of points may be low due to (a) the City using the 2003 editions, or (b) IMC, IPC, and IFGC are not explicitly adopted. These points are in jeopardy if adoption of the 2012 I-Codes is not done before the next verification. • Recommendation: H. Baynum observed that some homes built after adoption of flood regulations do not have exterior equipment at the same elevation as the lowest floor. Elevation Certificates could be reviewed to verify this observation. It is likely that flood insurance policies on these homes are more expensive than if the equipment was at the same elevation. The

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	2012 I-Codes explicitly require equipment to be at the same elevation. The City may want to inform property owners that they may qualify for lower flood insurance premiums if they raise the equipment to or above the elevated floor. Whether an inspection or verification letter from the City would suffice or a new EC would be required is not clear (RCQ has asked FEMA).
IBC Appendix G Flood Resistant Construction is adopted • Appendix G contains some administrative provisions and requirements that apply to development other than buildings. • The provisions of Appendix G (2012 edition) compliment the technical provisions of the IBC and IRC to satisfy the requirements of the NFIP.	• H. Baynum advises that the City does not enforce Appendix G.
70-1(B) inserts June 16, 1995 in Sec. 1612.3, but does not insert the same date in G102.2. 70-1(C) does not insert in Table R301.2(1) information specific to flood hazard areas (footnote g, in 2012 IRC).	• FEMA considers Delaware a state in which "auto-adopt" is acceptable. DNREC says that it's up to each community to decide on whether "auto-adopt" is applicable. • Sec. 197-73(D)(1) doesn't actually identify the FIS/FIRM by title and date (thus does not meet NFIP requirement), but does refer to "the most recent … as amended from time to time." • Recommendation: The FIS and FIRMs need to be specifically adopted. See DNREC model ordinance.
70-5 Applicability to existing buildings (applies throughout the City, not just SFHA). (A) triggers compliance with the code if, in a 12-month period, the cost of "alterations or repairs" are in excess of 50% of the physical value of the building (B) triggers compliance if "damage by fire or otherwise" is in excess of 50% of the physical value	• H. Baynum advises that if work on existing dwelling includes structural changes, then the IRC provisions apply. Regardless of whether any structural changes are proposed, the NFIP expects communities to determine whether work on existing buildings in SFHA constitutes Substantial Improvement (SI) or repair of Substantial Damage (SD).

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
(C) triggers compliance of the portion of the building altered or repaired (to extent determined by the Building Official) if the alterations or repairs are more than 25% and less than 50% (D) the Building Official determines physical value.	• The NFIP and I-Code triggers are "equal to or exceed 50%" and only compliance with the flood provisions is required. Sec. 70-5 requires compliance with all requirements of the code, not just flood. • This section "accumulates" over a 12-month period; 197-73 has a 10-year period (see definitions for Substantial Improvement and Substantial Damage). • Fifty-percent of "physical value" is either 50% of "cost-value" or more than 50% of the square footage of the structure. This is not consistent with 197-73, the building code, and the NFIP, all use "market value." • Recommendation: Review DNREC guidance on documentation and review FEMA P-758, SI/SD Desk References and: o Maintain documentation of each determination o Consider using the materials in Appendix D and sample letters in Appendix E o Use consistent method/approach to determine "market value" (Section 4.7) • CRS 430 Higher Regulatory Standard (CSI): Lewes gets 77 points for cumulative substantial improvement (CSI) provided in 197-73. • CRS 430 Higher Regulatory Standard (LSI): Up to 90 points (2013 is 20 points) for lowering the threshold below 50%. (Nationwide, only 56 out of 1192 CRS communities get points for LSI.) • CRS 430 Higher Regulatory Standard (no existing activity): Include in definition of substantial damage the NFIP definition

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	of "repetitive loss by flood" (also qualifies for NFIP ICC claim payment to be used to bring buildings into compliance with flood requirements). • CRS 430 Higher Regulatory Standard (STF): Up to 50 points for staff qualification (not required to be in regulations, should be in position descriptions for Building Official, Plan Reviewer, Inspector, etc.). (See 2013, moved to Regulations Administration, RA.) • CRS 430 Higher Regulatory Standard (RA1): 2013 Manual, Regulations Administration, points for CFM, graduation from FEMA classes.
70-10 retention of records is "as shall be required by the City Council." • Under agreement with NFIP, the City is expected to permanently retain certain records	• Recommendation: Clarify procedures so that key records related to flood are retained permanently (Sec. 70-10). • CRS 310 Elevation Certificates (ORS) – moved to (RA) in 2013 Manual: 5 points for keeping ECs and other records in "safe and secure site" (specifically defined in the manual).
70-11 right of entry	• CRS 430 Higher Regulatory Standard (ENL): Also see notes on higher standards for enclosures at Sec. 197-73. CRS points are available for Nonconversion Agreements for enclosures below elevated buildings (additional points if recorded and provides for inspection) . A model agreement developed by Florida provided to H. Baynum (needs to be modified to provide for future inspection, if maximum points are desired).
70-22 required drawings and specification Does not list specifics to show, but covered by site plan requirements in IBC/IRC.	
70-25(B) provides that the Building Official may accept sworn affidavits from RDPs "without any examination or inspection".	• Use of affidavits not common, most likely to be used for commercial buildings. If used in SFHA, Building Official needs to verify compliance with flood provisions of the code.

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
• The NFIP requires communities to review applications for development in SFHAs and would hold the community responsible for noncompliance, not the RDP.	
70-32 allows the Building Official to issue a "special permit" for foundations, pending issuance of the permit.	• If located in a flood hazard area, the review of the plans for the special permit verifies compliance with the flood provisions of the code (and Sec. 197-73) applicable to foundations.
70-39 specifies required inspections. • IBC and IRC have specific inspections for buildings in flood hazard areas, one is called for after (or part of) the foundation inspection, and submission of the elevation certificate is required prior to final inspection. See 2012 IBC Sec. 110.3.3 and 110.3.10.1 and 2012 IRC R109.1.3 and R109.1.6.	• H. Baynum advises the inspections called for in the I-Codes are performed. • Sec. 197-73 does not have specific provisions for inspection, nor does Chapter 197, Article I General Provisions.
A.2 Chapter 170, Subdivision and Land Development	
IBC Appendix G and the NFIP regulations have requirements that apply to only to subdivisions in flood hazard areas without specified Base Flood Elevations. The FIRM for the City shows all flood zones have BFEs.	
170-4 definitions. • "Plan, Improvement Construction," "Plan, Subdivision," and "Sketch Tentative" specify certain things to be shown on plans.	• Specifics such as lot size, configuration, street frontage, open space are in Chapter 197 Zoning. • Does not specify that boundaries of flood hazard areas and flood zones should be shown.
A.3 Chapter 197, Zoning	H. Baynum advises editorial amendments have been adopted and definitions restored to 197-73 (flood).
197-3(D) encourages "smart growth" and "green infrastructure for management of stormwater," but does not	

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
have requirements.	
197-4(B). Grandfathers use of any building on which "actual construction" had started prior to the effective date. • The definition of "actual construction" is not equivalent to the NFIP definition for "start of construction." • Also see Sec. 197-13(3) which describes when "construction is begun."	
197-14 specifies that where this chapter differs from other rules, the stricter shall govern	• Substantial improvement and substantial damage provisions are in both the building code and Sec. 197-73, although the definitions in 197-73 differ (cumulative over 10-year period).
197-24 Open Space Zone. Several sections indicate low-density requirements	• CRS 430LD Land Development Criteria (LZ): 2013 Manual shows up to 600 points if zoning identifies different densities for different areas. Potential for points may be small because of small percentage of SFHA that is available for development.
197-49 [Dimensional Regulations] OS, R-1, R-2, R-2(H), R-3, R-4 and R-4(H) Zones, refers to Table with lot sizes, setbacks, heights • Zone AE and VE, max height is 34 ft for R-1 and R-4 & R-04(H) Dwelling, Two-Family • Zone AE and VE, max height is 34 ft or Established Building Line all zones is 34 ft for R-2 & R-2(H) and R-4 & R-4(H), Dwelling, Detached 197-50 [Dimensional Regulations] R-5, LC and LC(H) Zones, refers to Table with lot sizes, setbacks, heights • Zone AE and VE, max height in all zones is 34 ft (elsewhere in city maximum is 30.5)	• Max height in SFHA is 3.5 ft higher than elsewhere. • H. Baynum advises the max height limit in Zone AE and Zone VE has not created conflicts even for dwellings that are elevated high enough above the ground to provide for parking underneath (generally 3-4 feet above the BFE). Also see comment on 197-55, measuring "vertical distance."

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
197-51 [Dimensional Regulations] Nonresidential Zones, refers to Table with lot sizes, setbacks, heights • Zone AE and VE, max height is all zones is 40 (except 34 ft in Cultural/Historic)	
197-52 defines accessory buildings • Size "shall not exceed 900 sq ft for the first floor" • Not permitted: cooking facilities, toilet rooms (may have one sink), sleeping facilities • Table of Dimensional Regulations for Accessory Buildings and Structures specifies setbacks, distance from main building, stories, and height	• Specifying uses that are not permitted is not equivalent to specifying permitted uses (e.g., in SFHA only uses allowed are parking of vehicles, storage, and building access). • IBC doesn't define accessory structures (implication is shall comply fully, including elevation). • IRC does define the term, but with size limit of 3,000 sq ft and not more than 2 stories. • Sec. 197-73 has provisions for "accessory uses," some inconsistent with the NFIP.
197-55 Building Height C. Flood-prone areas. Specifies how "vertical distance" is measured:	• H. Baynum advises the height is not measures from the ground immediately adjacent to a building, but is measured from the horizontal plane that is at the elevation of the centerline of the street.
Article VI. Historic District Requirements 197-56 defines "historic properties" to be those "designated by the City Council"	
197-57 Historic Preservation Commission [197-58(F) indicates procedure for handling requests for designation "shall include reference to the guidelines" of the US DOI.	• H. Baynum advises the city's historic preservation program is certified by the State.
197-58 Procedures Before the construction, alteration, reconstruction, moving or demolition of any dwelling, residence or related	• NFIP and I-Codes allow substantial improvement (including repair of substantial damage) of historic structures without full

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
structures on property within the Historic District or on …application for permission from the HPC … • Building Official notifies applicants for building permits if project requires HPC approval	compliance. If handled by variance, then other measures to reduce vulnerability can be conditions of the variance in order to meet the minimum necessary expectation. • FEMA has examples of elevated/mitigated historic buildings that retain historic integrity, thus reducing vulnerability of the resources from future flooding. • Recommendation: Handle requests for improvement and repair of historic structures in the SFHA by variance (i.e., remove the exclusion from the definition for Substantial Improvement). Because variances are to be the minimum necessary, applicants would have to consider elevation and other measures that minimize exposure to future flooding. FEMA P-467-2, Floodplain Management Bulletin on Historic Structures http://www.fema.gov/media-library/assets/documents/13411?id=3282 National Trust http://www.preservationnation.org/resources/technical-assistance/flood-recovery/additional-resources/flood-book/Flood-Damage.pdf
197-59 Criteria; standards (Historic Preservation)	• Recommendation: Add a cross reference to the specific variance criteria in 197-73 for historic structures in SFHA.
197-73 Floodplains This section was amended 10/21/2013 to restore definitions that had been inadvertently not included in Sec. 197-106.	FEMA deems the flood provisions in the body of I-Codes to be consistent with the NFIP for buildings. Combined with IBC Appendix G, the codes satisfy all NFIP requirements. • Recommendation: Rather than administer both the codes and Sec. 197-73, the City should repeal Sec. 197-73 and either (regardless of the option selected, the City's higher standards should be retained by modifying DNREC's model or by

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	amendment Appendix G): 1. Not adopt Appendix G and instead, adopt DNREC's code coordinated ordinance (in development), or 2. Retain Appendix G and rely entirely on the codes and Appendix G, with modifications to pick up City-specific requirements (consult with DNREC).
RCQuinn did not perform a detailed review compared to NFIP regulations. A cursory review identifies numerous NFIP definitions and minimum requirements are missing and several requirements that are not consistent with the NFIP minimums, including: • Several definitions are not used (dune line, flood hazard district, legal nonconforming buildings; legal nonconforming lot; • Uses March 17, 1977; FEMA's records show March 15, 1977. • An important NFIP definition is missing (lowest floor) • Defines "permitted uses" and states permits not required. • Permits "service facilities" below FPE in Zone VE. • Doesn't clearly distinguish between provisions that apply in all zones from those that apply in either Zone AE or Zone VE. • Does not require RDP to certify designs in Zone VE. A cursory review identifies several provisions that either exceed or are more specific than the NFIP, including:	Options for changes in minimum requirements in the codes and elsewhere: • <u>CRS 300 (no existing activity)</u>: Use depth grid (product of map revision) to develop estimates of depths and provide to inquirers along with zone and BFE information. • <u>CRS 430 Freeboard (FRB)</u>: Freeboard above that specified in IBC, IRC (2015 IRC will have BFE + 1 ft all zones). However, because the BFEs go down on the revised FIRM, BFE + 1 ft essentially results in the same elevation requirement based on the 2005 FIRM. H. Baynum advises most buildings have lowest floors higher than BFE + 18" in order to have sufficient headroom underneath for parking and storage. • <u>CRS 430 Foundation protection (FDN)</u>: Require engineered foundation in all flood zones (2007 up to 35 points; 2013 up to 80 points) • <u>CRS 430 Protection of Critical Facilities (PCF)</u>: Critical facilities (2007 up to 100 points; 2013 up to 80 points) • <u>CRS 430 Enclosure limits (ENL)</u>: Enclosures (e.g., limit size, prohibit, nonconversion agreement, no partitions); (2007 up to 300 points; 2013 up to 240 points) • <u>CRS 430 Coastal A Zones (CAZ)</u>: When the LiMWA is shown on the 2015 FIRM, treat CAZ like Zone V (already in IBC by

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
• Limits on storage of hazardous materials, pesticides, petroleum products, radioactive material • Cumulative substantial damage and cumulative substantial improvement (10 years) • Specific provisions for pipelines and storage tanks. • Specific provisions for public facilities and structures • Specific provisions for electrical distribution panels (although under the section for floodproofing).	reference to ASCE 24; will be in 2015 IRC). The LiMWA delineated by FEMA will be just slightly landward of the Zone V boundary. Consider designated additional land landward of the LiMWA as Coastal A Zone (e.g., seaward of the centerline of Bay Avenue, the centerline of Cedar Street, or a specific number of feet landward of the Zone V boundary). (2007 and 2013 up to 650 points, but with limitations and adjusted by ration of area designated CAZ to entire SFHA/Zone AE). • Recommendation: At a minimum, regulate area between LiMWA and Zone V as Zone V. Consider designating additional land landward of the LiMWA as Coastal A Zone (e.g., seaward of the centerline of Bay Avenue, centerline of Cedar Street, or a specific number of feet landward of the Zone V boundary). • CRS 430 (no existing activity): Require new buildings in specific areas (Zone V or seaward of the canal) to be designed and constructed to be "readily moveable" (Michigan has similar provision for buildings within erosion planning zones on Great Lake bluffs). • CRS 430 Local drainage protection (LDP new 2013): Local drainage protection, up to 120 points for requiring minimum elevation above grade, even in shaded and unshaded Zone X. Some credit available if enforce IBC & IRC requirements for positive drainage away from foundations.
197-74 Wetlands "Wetland buffer area" not defined in Chapter 197.	• Shoreline activities that could affect wetlands are regulated by DNREC and the Corps of Engineers.
197-75 Water resources protection areas Stormwater treated by approved stormwater quality management practice in accordance with state regulations.	• CRS 450 Stormwater Management Regulations, (SMR): Delaware's available statewide credit 124-224 points; City gets 140 points

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	• CRS 540 Drainage System Maintenance, debris removal (CDR): 2007 up to 300 points for inspecting drainage and removing debris (would need to keep records to document performance of inspections). 2013 reduces to maximum of 200 points. The City may be able to get points for maintenance by the Highland Acres Tax Ditch Authority. [In 2012, Bethany Beach, Dewey Beach, Fenwick Island, and South Bethany each got 200 pts.]
197-78 Erosion and sediment control Development or land-disturbing activity subject to the requirements of state handbook.	• CRS 450 Erosion and Sediment Control (ESC): available statewide credit 30 points.
197-86 Nonconforming buildings and structures Lawful before chapter was adopted, revised, or amended, that does not meet the dimensional and density standards • May not be enlarged or altered in any way that increases nonconformity • May not be grounds for addition of other structures or uses that do not conform • When damaged or destroyed (other than by neglect), may be repaired, rebuilt or reconstructed, provided not increased in size or sq footage nor … in manner that increases nonconformity	• It is unclear if the provision related to "dimensional and density characteristics," for nonconforming buildings that are damaged or destroyed would supersede the requirements of 197-73 (flood) and the building code. If yes, it's inconsistent with the NFIP.
197-92 Variance • Board of Adjustment	• Some inconsistencies with NFIP expectations for processing variances (needs side-by-side review). • Recommendation: If the City decides to modify any requirement based on sea level rise rationale, it should add to the variance considerations required to obtain variances in SFHA (Sec. 197-92).
197-106 Definitions Includes flood definitions: base flood; basement (not	• Defines: Government facilities and services; health care

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
NFIP); development (not flood); dwelling, manufactured home/mobile home (not flood); floodplain (very broad); one-hundred-year flood Augmented by most recent amendment; presumably if defined in 197-73, applies in 197-73, and these definitions apply elsewhere.	facilities; hospital; nursing and similar care facilities; nursing home. • CRS 430 Protection of Critical Facility (PCF): 2013 up to 80 points available for prohibiting critical facilities in SFHA or regulating to 500-year flood elevation; but no points if SFHA is zoned such that critical facilities wouldn't be allowed anyway.
A.4 Building Permit Application Form (New Construction; 5 pages) (Renovation / Addition / Demolition; 1 page) • Does not require the applicant (nor provide space for city) to identify if in SFHA, panel number/date, flood zone, BFE • Note at the bottom that "Sussex County Permit is also required" (county building permits required in addition to city permits). • Property survey is required (original survey required for application for New Construction)	• H. Baynum advises applicants typically know if a site is in SFHA, but may not know the zone or BFE, which are checked as part of plan review (not intake). • Recommendation: Modify the application forms to add identification of flood zone, BFE and FIRM panel.
A.5 Comprehensive Plan (October 2005)	No content specific to sea level rise or climate change
Throughout, cites other plans: • 1999 Flood Mitigation Plan • 2000 Hazard Vulnerability	• The 1999 flood plan and 2000 vulnerability report were superseded by the Hazard Mitigation Strategy (2004-2009) and the current 2010 Sussex County Multi-Jurisdictional Hazard Mitigation Plan, which is now supplemented by the 2011 Hazard Mitigation and Climate Action Plan.
Sec. 2-2. Infrastructure – ends with Recommendations, including develop a program related to care and maintenance of drainage.	• On city land • Not applicable; no free-flowing streams
Sec. 2-3. Transportation • Includes brief description of roadway flooding and	New Road, most significant flooding problem (depth and frequency).

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
areas with limited access during flood events. • Identifies lack of signage related to evacuations	
Sec. 2-4. Other Community Facilities and Services • Recommendation to develop a brochure "describing flood hazards and evacuation procedures".	• See notes on CRS activities for StormReady community (SRC), Emergency warning dissemination (EWD), and Flood response operations (FRO).
Sec. 3-3. Natural Resources and Environmental Protection • "Clearly, the City of Lewes is dependent on the health of its wetlands for flood mitigation, drinking water quality and quantity, as well as the local tourism economy." • Coastal Building Line: notes similarity of DNREC rules and NFIP regulations; state permits required.	
Appendix C. Implemented Recommendations from Previous Plans: Listed several from the 1999 Flood Mitigation Plan: • Develop a hazard mitigation strategy • Conduct a hazard-vulnerability assessment • Determine structural-mitigation and retrofitting actions • Improve emergency operations communications and procedures • Send appropriate city personnel to training programs at FEMA's Emergency Management Institute • Modify the Lewes Zoning Code to have floodplain ordinances comply with FEMA's Model Code • Modify the definition of 'substantial improvement' and	

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
'substantial damage' in the Lewes Zoning Code to incorporate cumulative improvements and damage over 10 years • Modify the Lewes Zoning Code to enact stricter construction regulations in flood zones regarding: Pile Embedment Depth; Breakaway walls; Utilities; Flood and Corrosion resistant materials • Obtain accurate flood maps of Lewes' floodplains by petitioning FEMA to re-evaluate V Zone delineations • Obtain additional elevation information for areas in the floodplain in the City of Lewes, especially areas northeast of the Lewes and Rehoboth Canal, and disseminate this information to residents	
A.6 Hazard Mitigation and Climate Adaptation Action Plan (June 2011)	This plan supplements the 2010 Sussex County Multi-Jurisdictional Hazard Mitigation Plan (adopted by the City on July 12, 2010). NOTE: RCQuinn did not review the Sussex County 2010 Multi-Jurisdictional All Hazard Mitigation Plan
The City's Hazard Mitigation Team meets quarterly One-third of all structures (898 out of 2210) are in SFHA Used FEMA/HMGP funds to elevate 8 homes	• <u>Recommendation:</u> Re-run the analysis of number of structures in SFHA with revised FIRM, although unlikely to change the numbers much. The BFEs go down; based only on visual comparison, most significant changes to SFHA boundary appear to be on the west side of the city and related to using better topography • NFIP data as of 9/30/13: o 1,050 policies in Lewes (includes policies in Zone X) o 72 claims paid (31 closed w/o payment) • Only one building has received two claims since 1978, for total

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	of $16k (Greg Williams, 11/13/13)
3.1.8. Zone V described as "on the bayward side of Bay Avenue … eastward to include buildings in Pilot Point and Cape Shores."	Comparing 2005 SFHA/BFEs to the Preliminary SFHA/BFEs: • Zone VE boundary does not change • Zone VE BFEs go down 1 ft • Zone AE BFEs go down 1 ft • SFHA inland boundary changes due to use of more detailed topography • The FIS has stillwater elevations for the 500-year flood is 10.5 ft (probably should add wave height to approximate the elevation of the 500-year flood). Some anticipated sea level rise can be accounted for by regulating to the 500-year elevation.
3.1.8. Historic relative sea-level observations and trend lines (Figure 3.11) indicate "that sea level has been rising at a rate of approximately one foot per century since the 1920s." 4.2. DNREC "is currently working with the range of future sea level rise between 1.6 and 4.9 ft for planning purposes."	• Appendix A maps that illustrate the "100-year floodplain overlay" all use the 2005 SFHA • DNREC provided two maps that illustrate 2005 BFE +1 and BFE +2 only in the vicinity of New Road
4.2. "According to the average of 17 models, the annual mean precipitation rate for the State of Delaware is expected to increase 7—9 percent" (the scenarios for sea level rise are "estimates for 2100 under a low and high emissions scenarios"). DNREC establishes stormwater management standards.	
4.3 and 4.4.11. Recognize impacts of sea level rise include: • Areas once dry becoming permanent wet	• BFEs on Preliminary FIRMS go down by 1 ft, but the Zone V boundary does not change.

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
• Increased coastal flooding frequency • 1 percent flooding deeper, thus reaches farther landward	• Simply adding anticipated SLR in excess of 1 ft to current BFE will somewhat underestimate the BFE/wave height for that scenario, because where waves are present, every +1 ft increase in stillwater depth equates to +1.78 increase in BFE)
Figure 4.7. Maps generated by adding 0.5, 1.0, and 1.5 meters to the Mean Higher High Water level and using topographic maps to show land areas that are currently "normally dry" and above MHHW elevation, but be below under those SLR scenarios.	
Table 5.1. Critical facilities, based on 1/6/05 FIRMs. Note that some facilities noted as not in the SFHA have floors lower than the BFE because of the presence of basements.	
6.1. Lists the 10 strategies identified in the Sussex County Multi-jurisdictional hazard mitigation plan, identifying with asterisks those that are "the same as or will enhance the actions" identified in the HM&CAAP. 1. Review and update evacuation and notification procedures for the City.* 2. Improve stormwater management throughout the City. 3. Increase participation in the National Flood Insurance Program.* 4. Minimize damages from high wind events. 5. Implement a community outreach program.* 6. Reduce vulnerability to wildfires. 7. Continue data acquisition and enhancements to the GIS.* 8. Enlist the services of City service organizations in implementing a disaster preparedness outreach program.	• <u>Recommendation</u>: For the 2015 update of the Sussex County plan, consolidate strategies from both plans. In addition, rather than have two separate but very similar mitigation plans, either: o Incorporate content from the HM&CAAP into those portions of the multi-jurisdictional plan that pertain to the City so that the 2015 update formally supersedes the HM&CAAP, or o Include the HM&CAAP as an appendix to the multi-jurisdictional plan.

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
9. Facilitate the coordination of response procedures related to events. 10. Develop response plans (including evacuation and sheltering procedures) related to special needs populations and pets. Also include a "Refuge of Last Resort" Plan and a plan to transport City residents to county designated shelters.	
7.0 Guidance for Implementation Indicates the Comp Plan already include an action to "research, write and adopt ordinances to … riparian buffer zones"	
E. Implementation Steps – Zoning Code: Identifies suggestions that yield CRS points and improve resilience to SLR: • Freeboard • Stricter rules for critical facilities in SFHA • Prohibit sheds; prohibit "expansion of the footprint of existing homes" • Floodplain setback • Protection of floodplain storage	• It's unclear the rationale for recommending prohibition on sheds and increasing footprint of existing homes. • Setbacks are most effective when required as part of new subdivision layout. Effect would be small given how little land is available to be subdivided. • The concept of protecting floodplain storage really applies to riverine systems, where encroachments can obstruct free flow, causing water to 'back up'. However, limiting or prohibiting use of fill even in coastal SFHAs (Zone AE) means fewer local drainage concerns. • <u>CRS 432 Development limitations (DL); prohibition on fill (DL1):</u> 2013 up to 280 pts if regulations explicitly do not allow fill to elevate homes in Zone A/AE (and positively affects freeboard points).
Recommended Planning, Regulatory, and Management Options • In bullet about requiring "lowest floors to be elevated at	• Subdivisions options include dedicate SFHA to open space (no portion of platted lots "in"), or at least require footprint on ground above BFE. Effect would be small given how little land

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
least 1-2 feet of freeboard above" the BFE, a question about height restrictions is imposed. • New lots should not be created in the floodplain, "no new subdividing" • New structures set back from eroding shorelines • Regulate to future risk level, not past	is available to be subdivided.
Proposed Education and Outreach Strategy	(See notes below on Proposed CRS Strategy)
Proposed Evacuation Route / Proposed Infrastructure Analysis Strategies • Both include consideration of DNREC SLR planning scenarios (0.5, 1.0 and 1.5 meters).	
Proposed CRS Strategy • Create table of current CRS activities and scores	Possible activities not noted elsewhere in the regulations and document review: • <u>CRS 320 Map Information Service (2013 new MI elements):</u> Maximum credit is 90 points (City currently get 140 pts; activities have changed). • <u>CRS 330 Outreach Projects Strategy (OPS)</u>: See 2013 manual for replacement activities (PPI, FRP and STK): if developed according to 2013 CRS Guidance, may qualify for up to 380 points (currently get 71 points); most points are provided if developed by an "outreach strategy team," which could be an assignment made by council to an existing committee. H. Baynum advises some outreach effort every year, newsletter to SFHA properties (not whole city); State does hurricane awareness week and City piggybacks on that effort. • <u>CRS 330 Promotion of Flood Insurance (PFI)</u>: 2007 up to 65 points, but see 2013 370 Flood Insurance Promotion (up to 110

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
	points). • CRS 360 Flood Protection Assistance (FPA): 2007 up to 71 points, but infrequency of actual flooding may not warrant developing capabilities to implement. 2013 changes points and subactivities. • CRS 440 Benchmark maintenance (BMM): 2007 up to 90 points (unclear how many benchmarks are in city limits). 2013 will be 27 points. • CRS 440 FIRM maintenance (FM): 2007 up to 20 points; 2013 up to 15 points. Most points if maintain copies of all previous FIRMs (and FIS), including LOMRs, are retained. • CRS 510 Floodplain Management Planning (FPM): 2007 up to 359 points; 2013 is 382 points. Manual states "Hazard mitigation plans prepared to qualify for FEMA's hazard mitigation grants that are accepted by FEMA will receive some credit under this activity." . Number of points is a function of the planning process used. Verify the 2010 Sussex County plan was approved by FEMA. Review the requirements and documentation described in the 2013 CRS Manual to determine if the City should submit both the 2010 plan and the 2011 climate action supplement to ISO. [In 2012, Sussex municipalities that receive FPM points are Bethany Beach (64 pts) and South Bethany (74 pts), while Dewey Fenwick Island, Lewes, Rehoboth Beach, and Seaford did not.]
A.7 City Webpage	www.ci.lewes.de.us
Under <Plans & Maps> link from the front page, only the Amended Zoning Map and Canary Creek Development Lands Under the <Emergency Prep> link from the front page:	• CRS 350 Flood Protection Website (WEB): City gets 31 points out of 72. 2013 points increased to 76, and the requirements have changed. Review web content compared to the 2013 CRS

Notes on City Regulations and Documents	Comments and Questions Related to Duplication, Inconsistencies, and Opportunities for SLR and CRS
• "Flooding in Lewes," undated 3-page brochure Not directly linked from <Emergency Prep> Is a subpage titled "Lewes Flood Facts and The National Flood Insurance Program": • Some content is out-of-date	criteria to determine if revisions are necessary to qualify for more points. If a community's website does not have a search tool, the flood information needs to be linked from the front page.

APPENDIX B. REVIEW OF BACKGROUND DOCUMENTS

Two background documents were reviewed to identify possible recommendations:

- Association of State Floodplain Mangers, *Coastal No Adverse Impact Handbook* (2007); http://www.floods.org/index.asp?menuID=460&firstlevelmenuID=187&siteID=1
- The Georgetown Climate *Center Zoning for Sea Level Rise* (2012); http://www.georgetownclimate.org/zoning-for-sea-level-rise.

Notes on Background Documents	Comments Related to Lewes that are Prompted by Review
B.1 ASFPM: *Coastal No Adverse Impact Handbook*	Comments related to Lewes that are prompted by review.
Page 2: Description of "no adverse impact" and "resilience"	
Lewes 1/6/2005 FIRM show CBRS/OPA units: • Panel 190 (yes, extreme west end) • Panel 195 (yes , west of Roosevelt Inlet, also portion inland of inlet, also portion east of Freeman Memorial Hwy and north of Canal, which appears to be state park) • Panel 215 (yes, continuation of park)	• OPA boundary runs around 4 buildings west of Roosevelt Inlet and inland of Broadkill River (likely DNREC Lewes Facil; USCG, UDel bldgs); • Recommendation: Determine if any private land (with or without existing buildings) is within CBRS/OPA. If there are any, consider informing owners of limitations on flood insurance (can still build).
Page 18: Critical facilities (identified by HMPlan) in SFHA The list includes facilities owned by the city and several other owners. With the exception of the Wastewater Treatment Plant, none of the city-owned buildings are in the SFHA.	HMPlan Map A-10. • The WWTP is owned by BPW). The BPW advises surveyed elevations for the Operations Building and Process Building show the lowest floors are at 9.55 ft and 10.32 ft respectively (in Zone AE, BFE = 9 ft).

Notes on Background Documents	Comments Related to Lewes that are Prompted by Review
	• The County's web application allows the public to view specific parcels for flood, wetlands, erosion. Unclear if the City can get CRS credits for the County's activity. • http://map.sussexcountyde.gov/SussexMapping/
Page 21: mapping standard, "reflect the anticipated sea level change"	• The preliminary FIS identifies the 500-year stillwater elevation is 10.5 ft. Based only the shaded Zone X (500-year) on preliminary FIRM, the south side of the canal appears to be relatively high ground and serves as a barrier to SFHA pushing inland (except for two low spots and on the west side where water comes from the inlet).
Chapter 4 Higher standards	Freeboard provides protection in areas already delineated as SFHA, but not areas that that will be subject to flooding under SLR scenarios, unless those "future floodplain" areas are delineated or described and officially adopted as subject to regulation.
	Enclosure limits (for new and substantial improvement/substantial damage); while not directly related to SLR, yields CRS pts.
	Related to impact of some higher standards described by ASFPM: • Few vacant lots in Zone VE. Approximately half of the buildings in Zone VE are post-FIRM, thus elevated on pilings/columns. Reinforces the importance of rules that affect redevelopment, reconstruction, and repairs. • If DNREC has erosion rates, are water and sewer lines within the zone likely to be eroded in 10-30 years and is that factored into BPW's plans?

Notes on Background Documents	Comments Related to Lewes that are Prompted by Review
Chapter 5 Mitigation HMPlan: HMGP funds have been used to elevate 8 homes; "many of the owner residential homes in Zone AE have been elevated by their owners." (p. 17)	City has no FEMA-defined repetitive loss or Severe Repetitive Loss properties. Only one building has received two claims, for total of $16k (Greg Williams, 11/13/13) • Recommendation: If homeowners are interested, the City could pursue additional funds to elevate, relocate (FEMA grants, ICC, city funds/loans). Not necessary to wait until damage occurs (although owners are likely to be more inclined to participate and it can make it easier to get projects approved).
Chapter 6 Infrastructure	Lewes has greenways, open space, plans
Chapter 7 Emergency Services	NWS StormReady (Lewes not listed; Sussex County is) • CRS 610 StormReady community (SRC): 2007 25-30 points, if also get FTR credit (flood threat recognition system, up to 40 points). 2013 some changes in points. [In 2012, Bethany Beach, Fenwick Island, and South Bethany each got 75 pts.] • CRS 610 Emergency warning dissemination (EWD): 2007 up to 60 points. Does city cooperate with county? 2013 up to 75 points. [In 2012, Fenwick Island (69 pts) and South Bethany (38 pts).] • CRS 610 Flood response operations (FRO): 2013 up to 115 points. [In 2012, Fenwick Island and South Bethany each got 23 pts.]
	Recommendation: Prepare the Building Department to respond to large-scale flood event, although NFIP claims records suggest little past flooding (72 claims paid since 1978): o Post-flood inspections to screen for SD o See FEMA P-758, sunny-day photos (if not already in assessment records)

Notes on Background Documents	Comments Related to Lewes that are Prompted by Review
	o Draft policy regarding permit fees for repair, demolition
Chapter 8 Public Outreach and Education	
B.2 Georgetown Climate Center: *Zoning for Sea Level Rise* (Maryland) The GCC's proposal relies primarily on creation of two new sea level rise zoning categories, a "Conservation Zone" and an "Accommodation Zone."	The following notes reflect consideration only for Lewes. Given land constraints in Lewes north of the canal, the GCC's zoning approach is deemed not practical.
Considers lack of a map other than FIRM showing SFHA (and shaded Zone X) to be a constraint, unless a community develops and adopts a specific SLR map.	• The preliminary FIS indicates the 500-year stillwater elevation is 10.5 ft.
Concludes regulating for future SLR is defensible if "rationally related to a legitimate public purpose," and specifically if applied to existing flood zone designations, including shaded Zone X as a proxy for SLR impacts.	
Cites examples of restricting rebuilding after storm damage, including a community that permits Zone V structures, if substantially damaged by storm, to be reconstructed one time; if substantially damaged again, rebuilding is prohibited. Opines that a rule that imposes restriction on rebuilding after a second storm would give property owners "sufficient time to amortize their investment in the property," may lead to conclusion that there is no taking if rebuilding a second time is not permitted.	• Developing a strategy for after major event is a good idea, even though NFIP claims records suggest little past flooding (72 claims paid since 1978). Would need to resolve whether such a restriction could be supported by calling sites on which twice-damaged buildings are located are unsafe, and that twice-damaged building are public nuisances. • Texas has a program to reimburse landowners for expenses incurred to relocate or demolish structures where redevelopment is prohibited by the state's Open Beaches Act. [A flood control district in Denver may have a program to buy land after homes are damaged by flood, the expectation being the insurance claim compensates for the building.]
Recommends including among site plan requirements, a provision that applicants provide an assessment of the "resilience of a project to SLR" over the life of the building. If listed as an explicit criterion for approval,	

Notes on Background Documents	Comments Related to Lewes that are Prompted by Review
should be defensible even if discretion implicit in deciding if the assessment is adequate. State of Maine requires assessment of vulnerability to 2 ft SRL and agency can deny or impose conditions if the side will "not be stable."	
Option (other than density restrictions) to not increase risk: limit footprint of new and substantial improved buildings; limit additions to existing	
Advises on the importance of including "potential SLR impacts" in criteria for variances, including increases over current base flood impacts.	• Important point if regulate to higher elevation based on SLR rationale. Mostly likely to have bearing on requests for variances to the elevation requirement.
Model SRL Overlay Ordinance (for Maryland) may have useful text (although some are poorly written): • SLR-specific findings and purpose statements • Findings to justify rebuilding restrictions; and language to implement • Findings regarding "inadequacy of FEMA maps" justifying increased regulation • Language for SLR risk assessment • Provision for critical facilities in 0.2% FHA (plus for SLR)	

APPENDIX C. Lewes: Existing CRS Activities for Examination and Additional New Activities for Consideration

The following table was prepared by copying the descriptions of all CRS activities from the 2013 CRS Coordinator's Manual. These descriptions are intended to be brief. Each activity, how it is scored, and whether an impact adjustment factor is applied, is described in detail in the Manual or in other CRS resource documents.

The purpose for this table is to identify in the columns on the right:

Column A: Points for the specific activities Lewes gets credit for (based on 2007 Manual)

Column B: Additional activities identified in the report for consideration are marked with a check (✓), as well as activities to be continued but that need to be examined for possible additional points which are marked with an arrowhead (➢)

*Notes:

1. The 2012 points don't line up perfectly with the 2013 activities
2. The City's breakdown by subactivity under 450 Stormwater Management has not been provided

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
310 ELEVATION CERTIFICATES—Maximum credit: 116 points		
Maintaining Elevation Certificates (EC): Up to 38 points for maintaining FEMA Elevation Certificates on all buildings built in the Special Flood Hazard Area (SFHA) after the date of application to the Community Rating System (CRS). All communities applying to the CRS must apply for this element. The community must make copies of the certificates available to all inquirers.	**50**	
Maintaining Elevation Certificates for post-FIRM buildings (ECPO): Up to 48 points for maintaining Elevation Certificates on buildings built before the date of application to the CRS but after the initial date of the Flood Insurance Rate Map (FIRM).		
Maintaining Elevation Certificates for pre-FIRM buildings (ECPR): Up to 30 points for maintaining Elevation Certificates on buildings built before the initial date of the FIRM.		
320 MAP INFORMATION SERVICE—Maximum credit: 90 points	**140**	➢
Basic FIRM information (MI1): 30 points for providing basic information found on a Flood Insurance Rate Map (FIRM) that is needed to accurately rate a flood insurance policy.		
Additional FIRM information (MI2): 20 points for providing information that is shown on most FIRMs, such as protected coastal barriers, floodways, or lines demarcating wave action.		
Problems not shown on the FIRM (MI3): Up to 20 points for providing information		

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
about flood problems other than those shown on the FIRM.		
Flood depth data (MI4): Up to 20 points for providing information about flood depths.		
Special flood-related hazards (MI5): Up to 20 points for providing information about special flood-related hazards, such as erosion, ice jams, or tsunamis.		
Historical flood information (MI6): Up to 20 points for providing information about past flooding at or near the site in question.		
Natural floodplain functions (MI7): Up to 20 points for providing information about areas that should be protected because of their natural floodplain functions.		
330 OUTREACH PROJECTS—Maximum credit: 350 points	**71**	➢
Outreach projects (OP): Up to 200 points for designing and carrying out public outreach projects. Credits for individual projects may be increased if the community has a Program for Public Information (PPI – see note below).		✓
Flood response preparations (FRP): Up to 50 points for having a pre-flood plan for public information activities ready for the next flood. Credits for individual projects may be increased by the PPI multiplier.		
Program for Public Information (PPI): Up to 80 points added to OP credits and up to 20 points added to FRP credits, for projects that are designed and implemented as part of an overall public information program. ***NOTE:*** *A Program for Public Information can help design an entire public information program, not just outreach projects. A PPI that covers other types of public information endeavors, such as a website and technical assistance, can result in increased credit under other activities.*		
Stakeholder delivery (STK): Up to 50 points added to OP credits for having information disseminated by people or groups from outside the local government.		
340 HAZARD DISCLOSURE—Maximum credit: 80 points		
Disclosure of the flood hazard (DFH): Up to 25 points if real estate agents notify those interested in purchasing properties located in the Special Flood Hazard Area (SFHA) about the flood hazard and the flood insurance purchase requirement. An additional 10 points are provided if the disclosure program is part of a Program for Public Information credited under Activity 330 (Outreach Projects).		
Other disclosure requirements (ODR): Up to 5 points for each other method of flood hazard disclosure required by law, up to a maximum of 25 points.	**15**	
Real estate agents' brochure (REB): Up to 8 points if real estate agents are providing brochures or handouts that advise potential buyers to investigate the flood hazard for a property. An additional 4 points are provided if the disclosure program is part of a Program for Public Information credited in Activity 330 (Outreach Projects).		
Disclosure of other hazards (DOH): Up to 8 points if the notification to prospective buyers includes disclosure of other flood-related hazards, such as erosion, subsidence, or wetlands.		
350 FLOOD PROTECTION INFORMATION—Maximum credit: 125 points		
Flood protection library (LIB): 10 points for having 10 Federal Emergency Management Agency publications on flood protection topics housed in the public library.	**18**	

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
Locally pertinent documents (LPD): Up to 10 points for having additional references on the community's flood problem or local or state floodplain management programs housed in the public library.	**1**	
Flood protection website (WEB): Up to 76 points for providing flood protection information via the community's website. An additional 29 points are provided if the website is part of a Program for Public Information (credited under Activity 330 (Outreach Projects)). There are four ways to receive credit under this element: **WEB1:** for providing more information on the messages conveyed in the community's outreach projects credited under Activity 330 (Outreach Projects). **WEB2:** for providing information on warning, safety, evacuation, and other topics of immediate concern when a flood threatens. **WEB3:** for posting or linking real-time gage information so users can see current water levels and, where available, flood height predictions. **WEB4:** for posting Elevation Certificates or the data from Elevation Certificates.	**31**	➢
360 FLOOD PROTECTION ASSISTANCE—Maximum credit: 110 points		
Property protection advice (PPA): Up to 25 points for providing one-on-one advice about property protection (such as retrofitting techniques and drainage improvements). An additional 15 points are provided if the assistance program is part of a Program for Public Information (credited under Activity 330 (Outreach Projects)).		✓
Protection advice provided after a site visit (PPV): Up to 30 points if the property protection advisor makes a site visit before providing the advice. An additional 15 points are provided if the site visit procedures are part of a Program for Public Information credited under Activity 330 (Outreach Projects).		✓
Financial assistance advice (FAA): 10 points for providing advice on financial assistance programs that may be available. An additional 5 points are provided if the financial assistance advisory service is part of a Program for Public Information credited under Activity 330 (Outreach Projects).		
Advisor training (TNG): 10 points if the person providing the advice has graduated from the EMI courses on retrofitting or grants programs.		
370 FLOOD INSURANCE PROMOTION—Maximum credit: 110 points		✓
Flood insurance coverage assessment (FIA): Up to 15 points for assessing the community's current level of coverage and identifying shortcomings.		
Coverage improvement plan (CP): Up to 15 points for a plan prepared by a committee that has representation from local insurance agents and lenders.		
Coverage improvement plan implementation (CPI): Up to 60 points for implementing the projects in the CP plan.		
Technical assistance (TA): Up to 20 points for providing advice about flood insurance.		
410 FLOODPLAIN MAPPING—Maximum credit: 802 points		
New study (NS): Up to 290 points for new flood studies that produce base flood elevations or floodways.		
Leverage (LEV): The points for NS are multiplied by a ratio that reflects how much of the study was financed by non-Federal Emergency Management Agency (FEMA) funds.		

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
State review (SR): Up to 60 points for flood studies reviewed and approved by a state or regional agency.		
Higher study standards (HSS): Up to 160 points if the new study was done to one or more standards higher than the FEMA mapping criteria.		
More restrictive floodway standard (FWS): Up to 110 points, based on the allowable floodway surcharge used in the study.		
Floodplain mapping of special flood-related hazards (MAPSH): Up to 50 points if the community maps and regulates areas of special flood-related hazards.		
Cooperating Technical Partner (CTP): Up to 132 points if the community, appropriate regional agency, or state has a signed, qualifying Cooperating Technical Partner agreement with FEMA.		
420 OPEN SPACE PRESERVATION—Maximum credit: 2,020 points. OSI and LZ are not counted toward the maximum credit because these two elements and OSP are mutually exclusive.	**109**	➢
Open space preservation (OSP): Up to 1,450 points for keeping land vacant through ownership or regulations.		
Deed restrictions (DR): Up to 50 points extra credit for legal restrictions that ensure that parcels credited for OPS will never be developed.		
Natural functions open space (NFOS): Up to 350 points extra credit for OPS-credited parcels that are preserved in or restored to their natural state.		
Special flood-related hazards open space (SHOS): Up to 50 points if the OPS-credited parcels are subject to one of the special flood-related hazards or if areas of special flood-related hazard are covered by low- density zoning regulations.		
Open space incentives (OSI): Up to 250 points for local requirements and incentives that keep flood-prone portions of new development open.		
Low-density zoning (LZ): Up to 600 points for zoning districts that require lot sizes of 5 acres or larger.		✓
Natural shoreline protection (NSP): Up to 120 points for programs that protect natural channels and shorelines.		
430 HIGHER REGULATORY STANDARDS—Maximum credit: 2,042 points. Credit for FRB, FDN, ENL, and CAZ are not counted toward this total because those elements and DL credit are mutually exclusive.		
Development limitations (DL): Up to 1,330 points for Prohibiting fill, buildings, and/or storage of materials in the SFHA. DL1a – prohibit fill (with DL1b, up to 280 pts, affects FRB) DL1b – compensatory storage DL2 – prohibit buildings/certain buildings (up to 1,000 pts) DL3 – prohibit outside storage of materials (up to 50 pts)		✓
Freeboard (FRB): Up to 500 points for a freeboard requirement.		✓
Foundation protection (FDN): Up to 80 points for engineered foundations.		✓
Cumulative substantial improvements (CSI): Up to 90 points for counting improvements cumulatively.	**77**	➢
Lower substantial improvements (LSI): Up to 20 points for a substantial		✓

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
improvement threshold lower than 50%.		
Protection of critical facilities (PCF): Up to 80 points for protecting facilities that are critical to the community.		✓
Enclosure limits (ENL): 240 points for prohibiting first-enclosures (fewer points for limiting size/breakaway walls, nonconversion agreements)		✓
Building code (BC): Up to 100 points for adopting and enforcing the International Code Series.	**30**	➢
Local drainage protection (LDP): Up to 120 points for ensuring that new buildings are protected from shallow flooding.		✓
Manufactured home parks (MHP): Up to 15 points for removing the elevation exemption for manufactured homes placed in existing manufactured home parks.		
Coastal A Zones (CAZ): Up to 650 points for enforcing V Zone rules and/or ENL enclosure limits inland from the V Zone boundary.		✓
Special flood-related hazards regulations (SHR): Up to 100 points for enforcing appropriate construction standards in areas subject to a special flood-related hazard.		
Other higher standard (OHS): Up to 100 points for other regulations. [Lewes suggestion: modify dfn "substantial damage" to add repetitive loss from flooding, also qualifies insured owners for ICC] [Lewes suggestion: require buildings in areas most likely to be exposed to erosion to be "readily moveable"] [Lewes suggestion: regulate the 500-year flood hazard area (pale grey) applying same standards as SFHA]		✓
State-mandated regulatory standards (SMS): Up to 20 bonus points if a regulatory standard is required by the state.	**20**	
Regulations administration (RA): Up to 67 points for having trained staff and administrative procedures that meet specified standards. RA1 – staff training RA2 – International Accreditation Service RA3 – at least three detailed inspections for new buildings RA4 – reinspection (when sold or rented) RA5 – off-site record storage		✓
440 FLOOD DATA MAINTENANCE—Maximum credit: 222 points (not including credit for special flood-related hazards)		
Additional map data (AMD): Up to 160 points for implementing digital or paper systems that improve access, quality, and/or ease of updating flood data within the community.		
FIRM maintenance (FM): Up to 15 points for maintaining copies of all Flood Insurance Rate Maps (FIRMs) that have been issued for the community and making them available to the public.		✓
Benchmark maintenance (BMM): Up to 27 points for a program that maintains benchmarks so surveyors can find them and can depend on them to be accurate.		✓
Erosion data maintenance (EDM): Up to 20 points for maintaining coastal erosion data as described in *CRS Credit for Management of Coastal Erosion Hazards*.		
450 STORMWATER MANAGEMENT—Maximum credit: 755 points	**200**	➢

2013 CRS COORDINATORS MANUAL: SUMMARY OF CREDIT ACTIVITIES *[points for some activities are not additive]*	**A**	**B**
Stormwater management regulations (SMR): Up to 380 points for regulating development on a case-by-case basis to ensure that the peak flow of stormwater runoff from each site will not exceed the pre-development runoff. SMR credit is the sum of four sub-elements: (1) Size of development regulated (SZ): Up to 110 points. (2) Design storms used in regulations (DS): Up to 225 points. (3) Low-Impact development (LID): Up to 25 points. (4) Public maintenance of required facilities (PUB): Up to 20 points.		
Watershed master plan (WMP): Up to 315 points for regulating development according to a watershed management master plan. WMP is the total of eight sub-elements.		
Erosion and sedimentation control regulations (ESC): Up to 40 points for regulations to minimize erosion from land disturbed due to construction or farming.		➢
Water quality regulations (WQ): 20 points for regulations that improve the quality of stormwater runoff.		
510 FLOODPLAIN MANAGEMENT PLANNING—Maximum credit: 622 points		
Floodplain management planning (FMP): 382 points for a community- wide floodplain management plan that follows a 10-step planning process: *[steps not shown]*		✓
Repetitive loss area analysis (RLAA): 140 points for a detailed mitigation plan for a repetitive loss area.		
Natural floodplain functions plan (NFP): 100 points for adopting plans that protect one or more natural functions within the community's floodplain.		
520 ACQUISITION AND RELOCATION—Maximum credit: 2,250 points. A community can obtain credit under one or a combination of elements. The elements reflect the different scoring that is applied to different types of buildings. A given building can only be credited under one element.		
Buildings acquired or relocated (bAR) from the regulatory floodplain.		
Buildings on the repetitive loss list (bRL) that have been acquired or relocated.		
Severe Repetitive Loss properties (bSRL) that have been acquired or relocated.		
Critical facilities (bCF) that have been acquired or relocated.		
Buildings located in the V Zone or coastal A Zone (bVZ) that have been acquired or relocated.		
530 FLOOD PROTECTION—Maximum credit: 1,600 points. Of the 1,600 points, credit for sewer backup protection projects is limited to 200 points and flood control techniques are limited to 1,000 points.		
Flood protection project technique used (TU): Credit is provided for retrofitting techniques or flood control techniques.		
• **Retrofitting technique used:** Points are provided for the use of elevation (TUE), dry floodproofing (TUD), wet floodproofing (TUW), protection from sewer backup (TUS), and barriers (TUB)		
• **Structural flood control technique used:** Points are provided for the use of channel modifications (TUC), and storage facilities (TUF).		
Flood protection improvement (FPI): Credit points are determined for the difference		

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between the level of flood protection provided before and after the project.		
Protected buildings (PB): The value of TU is multiplied by the value of FPI		
for each building and used in the credit calculation.		
540 DRAINAGE SYSTEM MAINTENANCE—Maximum credit: 570 points		
Channel debris removal (CDR): Up to 200 points for inspecting public and private drainage systems and removing debris as appropriate.		✓
Problem site maintenance (PSM): Up to 50 points for paying special attention to known problem sites, such as those needing more frequent inspections.		
Capital improvement program (CIP): Up to 70 points for having a capital improvement program that corrects drainage problems.		
Stream dumping regulations (SDR): Up to 30 points if the community has and publicizes regulations prohibiting dumping in streams and ditches.	**15**	
Storage basin maintenance (SBM): Up to 120 points for annually inspecting public and private storage basins and performing the required maintenance.		
Coastal erosion protection maintenance (EPM): Up to 100 points for maintaining erosion protection programs in communities with coastal erosion-pone areas as described in *CRS Credit for Management of Coastal Erosion Hazards*.		
610 FLOOD WARNING AND RESPONSE—Maximum credit: 395 points		
Flood threat recognition system (FTR): Up to 75 points for a system that predicts flood elevations and arrival times at specific locations within the community.		
Emergency warning dissemination (EWD): Up to 75 points for disseminating flood warnings to the public.		✓
Flood response operations (FRO): Up to 115 points for implementation of specific tasks to reduce or prevent threats to health, safety, and property.		✓
Critical facilities planning (CFP): Up to 75 points for coordinating flood warning and response activities with operators of critical facilities.		
StormReady community (SRC): 25 points for designation by the National Weather Service as a StormReady community.		✓
TsunamiReady community (TRC): 30 points for designation by the National		
Weather Service as a TsunamiReady community.		
630 DAMS—Maximum credit: 160 points		
State dam safety program (SDS): Up to 45 points based on the credit for the state's program.		
Dam failure threat recognition system (DFR): Up to 30 points for having a system to advise the emergency manager when there is a threat of a dam failure.		
Dam failure warning (DFW): Up to 35 points for disseminating the warning to the public.		
Dam failure response operations (DFO): Up to 30 points for planning and practicing specific tasks to be undertaken to reduce or prevent threats to health, safety, and property.		
Dam failure critical facilities planning (DCF): Up to 20 points for coordination of dam failure warning and response activities with operators of critical facilities.		