HANCOCK COUNTY ME HAZARD MITIGATION PLAN – 2012 Update

SECTION 4 RISK ASSESSMENT

The 44 CFR §201.6(c)(2) outlines specific information that Hancock County must consider when completing the risk assessment portion of this mitigation plan. Our local risk assessments provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. This plan includes detailed descriptions of all the potential hazards that could affect the jurisdiction along with an analysis of the jurisdiction's vulnerability to those identified hazards. Specific information about numbers and types of structures, potential dollar losses, and an overall description of land use trends in the jurisdiction are included in this analysis. Because this is a multi-jurisdictional plan, those risks with potential to impact only portions of the County were assessed separately in the context of the plan.

This section includes the following eight subsections as follows:

5) Identify Hazards
6) Profiling Hazard
7) Assessing Vulnerability: Identifying Assets
8) Assessing Vulnerability: Addressing repetitive loss properties
9) Assessing Vulnerability: Identifying Structures
10) Assessing Vulnerability: Estimating Potential Losses
11) Assessing Vulnerability: Analyzing Development Trends
12) Multi-jurisdictional Risk Assessment

5. IDENTIFYING HAZARDS

Requirement §201.6(c)(2)(i):	**The risk assessment shall include a description of the type … of all natural hazards that can affect the jurisdiction…**

The Hancock County Hazard Mitigation Planning Team of 2010-2012 reviewed the natural and manmade hazards that were addressed in the 2004 County Hazard Mitigation Plan, determining that the hazards potential remains constant with few changes. Tsunami has been included based upon data from the National Weather Service though this remains a low probability. Severe storms were separated and profiled as winter and summer storm hazard events. The data of past disaster declarations for Hancock County were updated, and current maps reviewed. Subject matter experts (National Weather Service, Maine Forest Service, and Gradient Planning, local first responders, community businesses, and County EMA) provided input and updated data, with risk assessment reviewed and updated accordingly by the Hancock County Emergency Management Agency and the Hazard Mitigation Planning Team.

The following table identifies the natural hazards to be profiled:

Hazard	How identified	Why identified
Severe Winter Storms	Review of past disaster declarations Inputs from residents Risk Assessment on the following pages Review of library historical data	Maine is frequently hit with blizzards and Northeaster storms. These can cause power outages, coastal erosion and transportation challenges. Hancock County coastal communities are often subject to ice storms such as the 1998 Ice Storm.

Flooding	Review of FIRM Maps Input from residents Review of past disaster declarations Identification of repetitive losses Review of SLOSH Maps. Risk Assessment on page 21	Associated with the effects of coastal storms, spring runoff and severe summer storms. Gravel roadways are often damaged during these events. The County contains two major rivers and many streams and lakes, and is located along the coast. Dams are also included in this section since a breach would cause a flash flood.
Severe Summer Storms	Review of past disaster declarations Inputs from residents Risk Assessment Review of other historical data	Hancock County has a large coastal area and exposed islands which are prone to potential tropical cyclone storm surge and associated strong winds and gusts.
Wildfire	Review of Maine Forest Service records Inputs from residents Risk Assessment on page 21	County is about 70% forested. Consistent early spring fire threat when debris burning occurs. One of the worst fires in Maine history burned a large portion of the County in October 1947.

A. Description of All Natural Hazards Potentially Affecting Hancock County.

The following table identifies the hazards that were eliminated from further consideration in the plan, due to a lack of historical evidence, lack of overall county-wide severity or a low likelihood for the event to occur. Although these disaster events were not profiled in the hazard mitigation plan, it is not the intent to state that these events will not nor could not occur, resulting in great damage. It was decided by the Hancock County Hazard Mitigation Planning Team to only profile the top four natural hazards most likely to occur.

Avalanche	Review of USGS Maps	There are no county mountains that hold amounts of snow capable of causing avalanches.
Blight/ Infestation	Review of State Entomological Office historical records Inputs from residents Risk Assessments on page 21	Though Hancock County is heavily dependent on its agricultural production, to include forestry, blueberries, and fishing, there are no historical records of major damage to these products that have caused serious economic conditions.
Building Collapse	Risk Assessment on page 22 Inputs from Fire Chiefs	The only likely building collapses will come from urban fire and there have been no incidents of deaths from this cause. Building Codes and inspections are now the norm for new construction.
Coastal Erosion	Input from State Planning Office (pre-2012) Input from NRCS Input from Maine DEP Input from residents	Hancock County is undergoing development pressure along the coast. Coastline stabilization measures have been implemented in the past year. Subcategory of severe storms.

Dam Failure	Review of Historical Records Risk Assessment on page 22	Dam failure is considered in the flooding section of the plan. There has been only one dam failure in the history of the county (19 caused only minor localized flooding. Likelihood of catastrophic failure low.
Disease & Epidemic	Based on historical information, information from the World Health Organization & US Center for Disease Control	The World Health Organization feels that in our increasingly interconnected world, new diseases are emerging at an unprecedented rate, often with the ability to cross borders rapidly and spread. These are addressed in the CDC's plans.
Drought	Review of State EMA records Review of NOAA records	Rainfall data doesn't show serious problem. The drought effects have never been long-term or sufficient enough to result in serious economic losses for a disaster.
Earthquake	Review of Maine Geological Survey records	Although Earthquakes are common in Maine, no significant damaging movement has occurred in 20,000 years. Numerous minor quakes, none exceeding a 4.2 magnitude, occurred in the Mt Desert area of Hancock County in 2006. In 2011, there were some "swarms" of earthquakes but no serious property damages resulted.
Hurricane	Review of past disaster declarations Review of library historical data Input from residents Risk assessments on page 21	The County is hit about every decade by a hurricane. Most hurricanes have been downgraded to tropical storms when they reach Hancock County. They do not cause any significant damage to personal and property. Flooding from this event will be discussed under the Flooding Hazard. One life was lost from storm surge as Hurricane Bill passed 200 miles off shore because spectators were too close to the shoreline.
Landslide	Review of Maine Geological Survey	Landslides are not common in Hancock County.
Subsidence	Review of Maine Geological Survey and Soil and Water Conservation report on soil types in Hancock County.	No known cases of subsidence within the County.
Tornado & Severe Wind Storms	Review of NWS records	On average 1-2 tornadoes occur in Maine each year. There has been no loss of life or major damages in many years.
Urban Fire	Risk Assessment on page 22	The City of Ellsworth had a city-wide fire in1933. The Town of Mt Desert suffered losses as the result of a fire that consumed 5 businesses in July 2008 that resulted in an economic injury declaration.

Historical Records of Hazard Events in Hancock County

The Team found few records of disasters during the first half of the 20th Century impacting Hancock County. This is due in part to the poor recordkeeping; the fact that there was very little development in Hancock County before 1950; and that residents mostly lived in homes built in the

19th Century, built to withstand winter storms and constructed out of areas prone to flooding. After 1950, a population influx into Hancock County saw construction take place upon previously undeveloped, unproven lands. Additionally, there was very little threat from wildfires before the 1950s due to much of the then-developed land having been cleared for farmland. After 1950, many of the farms ceased production, their fields having since been recaptured by forests.

In this revision, past storm damages have been broken out by hazard. See "occurrences" tables for each profiled hazard in the following pages.

The following worksheet was reviewed by the Hancock County Hazard Mitigation Planning Team to assess any changes or additional information since 2004 related to the known natural and manmade disaster events and to analyze the severity and likelihood of these events. The team prioritized the events and profiled the top four hazards.

Worksheet - Identify the Hazards
Reviewed: June 10, 2010

Type of Hazard	Hazard Events (Dates/Casualties/Damages)	Source of Information	Rating	Priority
Blight/Infestation	Crop Diseases Forest Parasites	Dept of Conservation Dept of Agriculture	2B	5
Coastal Erosion	Tremont road lost 320 miles of unstable bluffs	Maine Coastal Program	2A	3
Dam Failure Incorporated into flooding section	1923 Union River Dam 2 FERC Dams in County	Newspaper MEMA	3C	4
Drought	2001 Drought	MEMA NWS	1.5C	6
Flooding	May 1993	FIRM	2A	3
Hurricanes/ Severe Summer Storms	5 CAT-1 storms in 20th Century	NWS	3B	2
Landslide	No good evidence	Local knowledge	1.5C	7
Severe Winter Storm	Ice Storm 98 Typical Blizzards	NWS	3A	1
Tsunami	Only known occurrence was in 1920's. No damages recorded and no documented occurrence since.	NWS	1C	6
Wildfire	October 1947 Fire	Maine Forest Service	3B	2

Rating:	Severe	(Multiple deaths, Mass casualties, or Millions of dollars in damages)	= 3
	High	(Deaths or Injuries, or 100,000s of dollars in damages)	= 2.5
	Moderate	(Single death or several injuries, or 10,000s of dollars in damages)	= 2
	Low	(Injuries or a 1,000s of dollars in damages)	= 1.5
	Slight	(No deaths, single injury, or 100s of dollars in damages)	= 1

Very Likely = A
Possible = B
Very Unlikely = C

6. **PROFILING HAZARD EVENTS**

Requirement §201.6(c)(2)(i):	**The risk assessment shall include a description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.**
Elements	**A. Identify the location.** **B. Identify the extent.** **C. Identify previous occurrences.** **D. Include probability.**

1. <u>Severe Winter Storms</u>

A. Location:

Neither the State of Maine nor the National Weather Service provides data on snowfall and ice storm on a town by town basis. Normally there are only one or two locations within a Maine County that records weather data. For Hancock County, the only weather station is located on Mount Desert Island. Therefore, the entire county is modeled as one entire hazard area for severe winter storms.

While the entirety of Hancock County is subject to major snowfall events, its northern half is typically prone to higher precipitation amounts. The entire County can experience a major ice storm, as it did in January 1998, however, the coastal communities on the mainland and on the islands, which contain the vast majority of the population, experience icing conditions more frequently. Finally, the entire County is very susceptible to “Nor’easter” winter storms and severe coastal storms, especially from the very high winds that are involved in such a storm.

B. Extent:

The Gulf Stream follows a path up the eastern seaboard bringing major storms with it to the Gulf of Maine. Air streams containing much colder air flow down from Canada and collide with the Gulf Stream over the New England region. Since 1993, Hancock County has been included in two Federally-declared winter storm disaster events, and six emergency “snow” declarations. For Hancock County, as for the State of Maine, the worst winter storm is the ice storm of 1998. Damages in Hancock County exceeded one million dollars and statewide more than forty-seven million. It was the worst storm in the past two decades and caused damages throughout the entire County. This storm, which nearly destroyed the electrical transmission system in the State of Maine, caused major damage to the forests, covered many roadways with debris and ice, and caused some limited building damages. However, most winter storms in the County are large snow storms which can overwhelm the highway snow removal operations and cause localized power outages. Frost heaves have also caused damages to road surfaces.

C. Occurrences:

Month	Year	County	Damage (as noted in the declaration)	Declaration
Feb. 19 Snowstorm	1972	Hancock	n/a	State Aid
Jan 10 Rain/Snow/Ice	1978	***Statewide***, including Hancock	n/a	*n/a*
Mar 13-14 Blizzard	1993	***Statewide***, including Hancock	Blizzards, severe winds and snowfall, coastal storm	*Presidential* FEMA-3099-EM-ME
Jan 5-25 "Great Ice Storm of 98"	1998	***Statewide***, including Hancock	Power outages Forestry damage	*Presidential* FEMA-1198-DR-ME
Mar 5-31	2001	Hancock	Maine severe winter storm,	*Presidential* FEMA-3164-EM-ME
Dec 17 2002 - Jun 1, 2003	2003	Hancock	Extreme winter weather; severe cold and frost	*Presidential* FEMA-1468-DR-ME
Dec 6-7	2003	Hancock	Winter storms and extreme cold	*Presidential* FEMA-3190-EM-ME
Dec 14-15	2003	Hancock	Winter storms and extreme cold	*Presidential* FEMA-3194-EM-ME
Feb 10-11	2005	Hancock	Winter storms and extreme cold	*Presidential* FEMA-3206-EM-ME
March 9	2005	Hancock	Winter storms and extreme cold	*Presidential* FEMA-3209-EM-ME

D. Probability of Occurrence:

Based on the forty year history in the table above, and the county's location in the northeast, it is expected that a winter storm will create damages in Hancock County at least once every three years.

2. <u>Flooding</u>

<u>General Definition.</u> A temporary inundation of normally dry land as a result of: 1) the overflow of inland or tidal waters; and/or 2) the unusual and rapid accumulation or runoff of surface waters from any source. Note: the nature of Hancock County's geology and hydrology is such that flooding is usually fast rising but of short duration.

<u>Types of Flooding</u>. There are several different types of potential flooding in Hancock County:

- <u>Erosion/coastal erosion</u>. As defined in FEMA's Coastal Construction Manual, this includes a) beach erosion; b) bluff erosion; and c) coastal landslides. Under the

National Flood Insurance Program, it's defined as the gradual wearing away of land masses. In general, erosion involves the detachment and movement of soil and rock fragments during a flood or storm or, over a period of years, through the action off wind, water, or other geological processes. Episodic erosion is induced by a single storm event.

- Dam Failure. The sudden release of water resulting from structural collapse or improper operation of the impounding structure. Dam failure can cause rapid downstream flooding, loss of life, damage to property, and the forced evacuation of people.
- Flash flood: A flood event occurring with little or no warning where water levels rise rapidly due to heavy rains, ice jam release, or rapid snow melt.
- Ice jam. An accumulation of floating ice fragments that blocks the normal flow of a river. Ice flows can jam in river bends or against the sheet ice covering flatter reaches. The resulting ice jams can block flow so thoroughly that serious flooding may result within an hour of their formation. Failure of an ice jam suddenly releases water downstream.
- Riverine/riparian. Periodic overbank flow of rivers and streams, usually the result of spring runoff, but can also be caused by major rain storms.
- Urban. Overflow of storm sewer systems, following heavy rain or rapid snowmelt. Runoff is increased due to a large amount of impervious surfaces such as roof tops, sidewalks and paved streets.
- Beaver Dam Flooding. Flooding resulting from back-up and overflow of water resulting from beaver dams. In Hancock County, flood damages from beaver dams have included some washouts of roadways.

Hancock County is subject to riverine, storm surge, and wetland area flooding. The County EMA has reviewed the County's Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) to compile a profile of the flooding hazard in the County. The EMA staff completed research on flooding history in the County and indicated this data on the GIS base maps. Where the layers were available, the Municipal Base Maps show the areas susceptible to potential flooding.

A. Location:

There are two major rivers located in or along Hancock County. The Penobscot River and Penobscot Bay border on the towns of Bucksport, Verona Island, Orland, Penobscot, and Castine. The most susceptible to Penobscot riverine flooding is Bucksport. There are no dams on this river in Hancock County, although there are a large number of dams further north in Penobscot County.

Most of the dams in Hancock County are small and would not have a major flooding impact to the Hancock County towns. However, if a large dam, such as the Dolby Dam further upstream in Penobscot County were to fail it would take several days for the flooding to occur in Bucksport.

The Union River discharges from Graham Lake and flows through the City of Ellsworth and discharges into the Union River Bay with shores in the towns of Trenton and Surry. The Union River Dam did fail in April 1923 and caused major flooding in downtown Ellsworth and destroyed a bridge. The present dam has procedures in place for effective flood management. While flooding from the Penobscot and Union Rivers is not expected to be likely, it could be catastrophic if it were to occur.

There are four high hazard dams in Hancock County. The Verso Paper Dam, at Silver Lake, would impact the Town of Bucksport. The other three are owned by Black Bear LLC and would impact the city of Ellsworth. Emergency Action Plans (EAPs) are required of all high and significant hazard dams and must be reviewed regularly updated according to Maine State Law 37-B.

B. Extent:

Regarding the possibility of flooding from dam failure, MRSA Title 37-B, Chapter 24, also known as Maine's Dam Safety Law, classifies dams into three hazard potential ratings: H-high, S-significant and L-low. Each rating carries different responsibilities for the dam owners and situational awareness on the part of downstream residents and businesses. Dam owners with "high" or "significant" potential hazard ratings must produce an emergency action plan (EAP) and forward it to MEMA for compliance with the law. The primary purpose of the EAP is to alert and warn potentially affected residents and businesses in the listed "call down area" when there is a threat of failure or actual breach. Copies are kept by the owner, relevant local, county and state agencies and must be updated regularly. See definition excerpts from the law in the table below:

Hazard Ratings: Excerpts form Dam Safety Law Definition	
High	"…will probably cause loss of human life,"
Significant	"..no probable loss of human life but can cause major economic loss…"
Low	"..no probable loss of human life and low economic losses…"

HANCOCK COUNTY HIGH AND SIGNIFICANT HAZARD DAMS

DAM NAME	RIVER/STRM	HAZARD	STATE ID	NID #
Silver Lake	Tannery	**H**	105.0	ME00147
Ellsworth	Union	**H**	508.0	ME00263
Graham Lake	Union	**H**	509.1	ME00264
Graham Lake Flood Control	Union	**H**	509.2	ME83052
Lily Pond	Lily Brook	**S**	106.0	ME00585
Branch Lake	Branch Lake Stream	**S**	107.0	ME00265
Lower West Bay Pond	Lower West Bay Stream	**S**	108.0	ME00703
Long Pond	Long Pond Brook	**S**	112.0	ME00398
Alamoosook Lake	Narramissic River	**S**	110.0	ME00144
Toddy Pond	Brook to Alamoosook	**S**	111.0	ME00146

Source for tables on dams: Maine Emergency Management Agency

Most of the population of Hancock County resides near the coast and is therefore susceptible to storm surge created by a severe storm. The towns of Bar Harbor, Blue Hill, Brooklin, Brooksville, Castine, Cranberry Isle, Deer Isle, Gouldsboro, Hancock, Lamoine, Mount Desert, Penobscot, Sedgwick, Sorrento, Southwest Harbor, Stonington, Sullivan, Surry, Swans Island, Tremont, Trenton and Winter Harbor all have inhabited coastlines. The flooding caused by storm surges has also aggravated the coastal erosion problems in several towns. Since the 2005 plan was written, Bar Harbor has experienced erosion damages on the Old Bar Harbor Road; Castine has experienced erosion in the Back Shore Beach and Wadsworth Cove area; Cranberry Isle is subject to coastal flooding throughout town; Frenchboro has erosion and flooding at the Head of the Harbor area; Hancock has erosion at Carter's Beach; Lamoine has wash outs on the Berry Cove Road; Penobscot has erosion on the Northern Bay Road; Sedgwick has flooding and erosion in the

Steam Boat Landing area; Tremont has erosion on the Cape road; and Winter Harbor has a flooding problem in the Bay Street area. This is an annual problem in many of the towns. Deer Isle and Stonington can be cut off from the mainland when Sunshine Causeway is flooded by a storm surge event. The result of a flash flooding could and did necessitate the evacuation and temporary closure of Blue Hill Memorial Hospital until cleaned and water supplies were tested.

The majority of the flood damage in the County is caused by winter runoff in the spring time which undercuts or overtops rural roads. When Maine has an above average snowfall for the winter and then warmer temperatures and rainfall suddenly arrive in the spring, the snow pack melts off quicker then the watersheds can handle. This causes local water bodies to overflow their boundaries and flood nearby road surfaces. This has happened in the towns of Aurora, Bar Harbor, Brooklin, Bucksport, Castine, Eastbrook, Ellsworth, Franklin, Hancock, Lamoine, Mariaville, Osborn, Penobscot, and Sedgwick. Typically, this road damage is not major, though in severe weather events, it can absorb the municipal road maintenance budget for an entire year and does happen in several of the towns every year.

The Town of Dedham sustained $30,000 of damage to the Mountain Pond Road. The City of Ellsworth has had repetitive washouts on the Shore Road, Winkcumpaugh Road, Happytown Road, Spindle Road, Union Street, Boggy Brook Road, Scotts Neck Way, Cove Way, Nicolin Road, and Bohn Road. The Town of Mariaville has erosion on the River Road. The Town of Mount Desert has had flooding at Bruey Cove and Seal Harbor beach. The Town of Sullivan has roadway flooding issues on Long Cove, Preble Cove, Sullivan Harbor, and Vista Way, and culvert overflow problems on Thorne Road, Morancy Road, and Bert Gray Road.

Storm surges cause localized flooding and erosion along the coast and on Mount Desert Island. There have been five Category One hurricanes that have hit the Maine coast in the past century. These have caused flooding along the coast and on the islands and the high winds have damaged large amounts of trees, which in turn have created major electrical outages.

It is expected that a major flood event will cause mostly road damage in Hancock County at least once every decade. Flood zones are shown on the Municipal Base Maps included in this section.

C) Previous Occurrences

Month	Year	County	Damages	Declaration
Feb 8	1978	***Statewide***, including Hancock	High winds, tidal surge, coastal flooding	*Presidential* FEMA-550-DR-ME
April 1 (The "April Fool's Storm")	1987	Hancock (1 town)	Flooding especially to dirt roads	*Presidential* FEMA-788-DR-ME
April (The "Easter Flood")	1993	Hancock	Flooding from heavy rains and snow melt	*Presidential* FEMA-988-DR-ME
Mar 29 – May 3	2005	Hancock	Severe storms, flooding from prolonged snow melt	*Presidential* FEMA-1591-DR-ME
March	2007	Hancock	Flooding from heavy	*Presidential*

Month	Year	County	Damages	Declaration
16-18			rains and snow melt	FEMA-1691-DR-ME
April 15-23 (Patriot's Day Storm")	2007	Hancock	Severe storms, inland and coastal flooding	*Presidential* FEMA-1693-DR-ME
Sept 6	2008	Hancock	Severe storms, flooding	N/A did not meet state threshold
Oct 8	2008	Hancock	Severe storms, flooding	N/A did not meet state threshold
June 18 - July 8	2009	Hancock	Severe storms, flooding	*Presidential* FEMA-1852-DR-ME
Mar 12 - Apr 1	2010	Hancock	Severe storms, flooding	*Presidential* FEMA-1920-DR-ME

Probability of Occurrence:

It is expected that a major flood event will cause mostly road damage in Hancock County several times every decade. Known flood zones are shown on the municipal base maps included in this section.

Floods are described in local flood hazard studies in terms of their extent, including the horizontal area affected, and the related probability of occurrence for different extents of flooding. The most widely adopted design and regulatory standard for floods in the United States is the 1 percent annual chance flood and this is the standard formally adopted by FEMA. The 1-percent annual flood, also known as the base flood, has a 1 percent chance of happening in any particular year. It is also referred to as the "100-year flood".

3. Severe Summer Storms

Severe summer storm damages typically involve downed power lines, flooding from heavy rains, debris in the roadways and erosion along the coast from storm surge.

Types of Summer Weather Events:

> *Hurricane*: A tropical cyclone in which the maximum sustained surface wind is 74 mph or more.
>
> *Lightning*: a positive charge to build up on the ground beneath the cloud. The ground's electrical charge concentrates around anything that sticks up, such as mountains, lone trees, people, or even blades of grass. The charge streaming up from these points eventually connects with a charge reaching down from the clouds--lightning strikes kill more people annually than tornadoes and hurricanes combined..
>
> *Thunderstorm*: a violent, short-lived weather disturbance that is almost always associated with lightning, thunder, dense clouds, heavy rain or hail, and strong -

Tornado: A violently rotating column of air extending downward from a thunderstorm to the ground.

Microburst: A small, extremely intense downdraft which descends to the ground creating strong wind divergence. Microbursts are typically limited to area less than 2.5 miles across. This weather phenomenon is capable of producing damaging surface winds in excess of 100 mph. Generally, a microburst event will last no longer than 15 minutes.

A. Location of Hazard

The entire County is vulnerable to one or more severe summer storms each year, usually in the form of thunderstorms. Due to the cooling effects of the ocean which tend to suppress thunderstorm activity, the coastal towns are less affected. Therefore, the effects of summer storms are usually more common in the inland areas of the County.

B. Extent (Severity) of the Hazard

During the summer months, southwest to southerly winds become quite prevalent across the State. Because of the frequent formation of sea breezes, southerly winds are prevalent. When severe summer storms arrive in Hancock County, high winds can fell trees and branches onto power lines, causing power and communication outages. Heavy rains that often accompany thunderstorms can result in flash flooding or erosion. Lightning strikes can start fires. Any of these weather events can cause personal injury or property damage.

The impact of summer storms in Hancock County is usually restricted to flooding and erosion caused by the large amounts of moisture these storms can carry. Summer storms can cause damage to the low lying coastal roads and certainly to boats, beaches or seawalls.

C. Previous Occurrences:
In 2007, the Blue Hill Peninsula (particularly in the town of Castine) was impacted by a microburst. Fourteen stately Elm trees were destroyed and roads blocked. Some property damages included homes in the area and equipment in the athletic field of Maine Maritime Academy. The micro burst also cut across the Towns of Brooklin and Blue Hill.

Photo by: Tony Sturey NWS Caribou

In 2009, Hurricane Bill's slow northward track off the eastern seaboard created a dynamic fetch and helped to produce a series of large open ocean waves aimed at coastal New England. Wave periods reached into the 15-17 second range. These large swells began arriving along the coast overnight Saturday into Sunday, and compounded with an abnormally high tide Sunday afternoon at 1:30pm. As the swells arrived waves of 12 to 15 feet were common with occasionally larger waves.

On Sunday, August 23, 2009, as Hurricane Bill (downgraded to Tropical Storm) pass 200 nautical miles off the Hancock County coastline the large waves reached the surf zone, successive waves piled up along the shore, known as "wave setup". It was responsible for raising the mean water level between the breaking waves and the shore line. As breaking waves get larger, wave setup is amplified and raises the surf zone ambient water level allowing waves to surge up higher along the shore, closer to spectators watching the surf. The "wave setup" associated with Hurricane Bill along coastal Maine took many on-lookers by surprise, and certainly factored into the tragedy at Acadia National Park, when 10 spectators were sweep into the ocean. The result was that there was one lost off life and many injured.

Month	Year	County	Damages	Declaration
Sept. 11 "Edna"	1954	Hancock	Power outages; flooding and debris	Presidential #24
Oct. 29 "Ginny[i]"	1963	Hancock	Power outages; flooding and debris	No declaration
Sept. 6 "David"	1979	Coastal communities in Hancock County	Minor Damage	No declaration
Sept. "Diana"	1984	Coastal communities in Hancock County threatened	Minor Damages	No declaration
Aug	2007	Hancock (1 town; Castine)	Downed trees; road blockages	No declaration
Aug 23 "Bill"	2009	Hancock	1 death from large breaking wave	No declaration
Mar 12 Apr 1	2010	Hancock	Severe summer storm; flooding	Presidential FEMA-1920-ME

Photo 1- HURRICANE BILL SURF A.N.P.

4. Wildfire

Definition: A Wildfire is a fire that burns vegetative cover such as grass, timber, blueberry crops or slash. Wildfire is a natural phenomenon initially finding its origin in lightning. However, humans have become the greatest cause of wildfire in Hancock County. There are two types of wildfires:

Wildland fires are defined as those fires that burn vegetative cover: grass, brush, timber, blueberry barrens or slash.

Wildland urban interface fires are created where homes meet with highly volatile forest fuels.

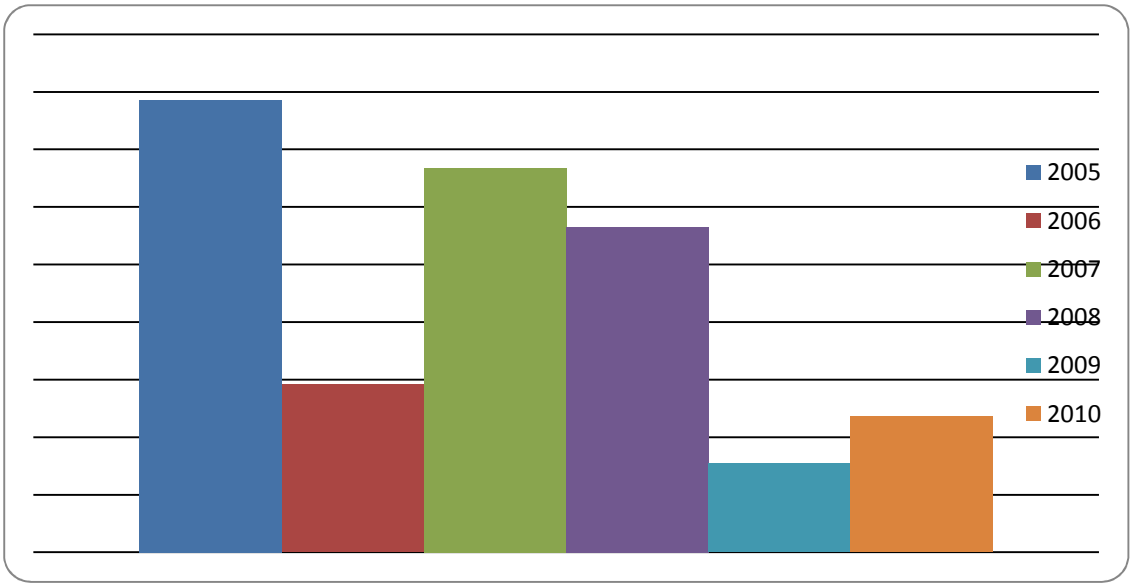
A. Location of Hazard:

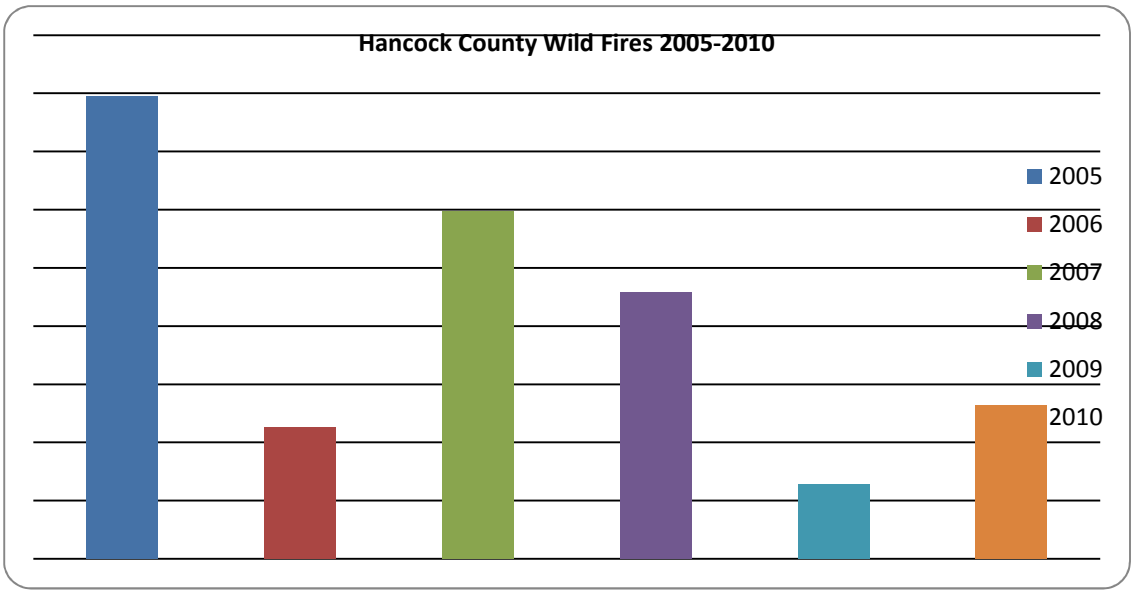
All parts of the County are subject to wildland fires, however the northern portion of the county presents the greatest acreage of productive forestland and the southern portion, especially Acadia National Forest on Mount Desert Island, presents the greatest danger to destruction of homes and businesses. The most common causes of wildfire are man-made due to a) debris burning (this includes permitted burns such as the burning of blueberry barrens), machine uses, campfires, arson and smoking. In only 3% of wildfires is the ignition source lightning. Therefore, locations of fires are likely to be anywhere careless people are located. From 2005 through 2010 there were 232 recorded wildfires in Hancock County that burned 270 acres of land, in 27 towns located all around the county. Maine Forest Service has made great strides in educating the public, through the internet and media outlets, on the dangers of wildland fires and mitigation activities.

B. Extent:

Nearly 70% of the County is forest land and the northern half of the County contains vast tracks of unbroken forests. The County has been hit with 232 low acreage wildland fires in the last 5 years. These fires burned over 270 acres of forest land during that time. By contrast, the most severe wildland fire in the County's recent history occurred in October of 1947, burned 17,846 acres, approximately 400 homes and caused 3 deaths on Mount Desert Island.

Information on wildland fires in Hancock County from 2005-2010 was obtained from planning team member, Ranger Rick Henion from the Maine Forest Service. Note that while the following tables show a general trending down of acreage burned and reported cost estimates, the situation could change in severe drought conditions.





C. Occurrences:

As excerpted from the 2010 State Plan and reviewed with the Team, the largest wildfires affecting Hancock County (those over a thousand acres) were quite some time ago. Part of this is due to today's prevention and suppression efforts which have been able to keep fires relatively small and contained, but again, this could be a challenge in prolonged drought conditions.

HISTORY- MAJOR WILDFIRES					
Month	**Year**	**County**	**Damages**	**Acreage**	**Declaration**
Oct 23	1947	Hancock	Unknown for county	Unknown for county	n/a
Sep 5	1960	Hancock	Unknown for county	Unknown for county	n/a
Aug	1989	Hancock	Shut down of Jackson lab	N/A	n/a

D. Probability:

It is expected that low acreage wildland fire events will cause damages in Hancock County several times each year. However, they do not rise to the level of the 1947 fire as there have been considerable mitigation efforts through suppression and training. Hancock County has an active countywide fire fighters' association, automatic mutual aid, up-to-date fire fighting resources and communication systems in place. Maine Forest Service has made exceptional contributions in public education.

7. **ASSESSING VULNERABILITY: Overview**

Requirement §201.6(c)(2) (ii)	**The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of: The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas**
Elements	**A: include an overall summary of vulnerability to each hazard** **B: impact on the community of each hazard**

SEVERE WINTER STORMS – Vulnerability and Impacts

Since Hancock County is located in the Northeast it is at high risk for winter storms. Therefore, the most likely damages from a severe winter storm event are the loss of electrical power, from downed power transmission lines, and the blockage of roadways, from tree debris, winter snow or ice. The coastal areas along the mainland and on the islands, which contain the vast majority of the county's population, are more likely to experience ice storms as opposed to the northern sections of the County, which are more likely to experience significant snowfall. The entire County is very susceptible to blizzards.

There is potential for loss of life caused by delayed responses from emergency services, carbon monoxide poisoning from the improper use of backup heat sources, freezing conditions, and from

storm-related vehicle accidents. Other types of general damage to personal and real property may be caused by blizzard or hurricane force winds. The very presence of a blizzard will hamper transportation routes in the area, resulting in some elderly or access & functional needs population isolated in their homes and at risk of hypothermia, lack of medications or food. Additionally there could be losses of income for local businesses.

SEVERE SUMMER STORMS – Vulnerability and Impacts

The entire county is vulnerable to thunderstorms, microbursts and high winds, especially high winds associated with severe coastal summer storms. The heavy, sudden rains from thunderstorms or the wind driven rains from tropical storms can cause severe road washouts on interior gravel roads or erode roads along the coast.

FLOODING – Vulnerability and Impacts

Some of the County's most serious flooding has been in coastal area, where flooding is worsened by tidal action which can result in coastal erosion. Many communities in Hancock County are rural in nature and are served by roads that do not have proper storm drainage systems. Spring run off in area with significant elevation may be impacted by spring runoff undermining road beds and culverts, such as Blue Hill and Schoodic Peninsula, Northern Hancock County and Mount Desert Island. Most of the developed areas are located outside of designated flood plains. Though there are very few critical facilities in the 100 year flood zone, there are several facilities that are located in the Hurricane Surge Inundation Areas. In the event of a storm surge from a Cat 2 storm would likely impact communities in the Penobscot Bay area.

In Hancock County, the most likely damages caused by flooding are the destruction of roadways caused by washouts and undercutting. There could be loss of life caused by delayed responses from emergency services during high water (river and lake) conditions. Flood waters may also contaminate public and private water supplies and damage personal and real property. Flooding may shut down businesses, resulting in losses of income for local businesses and residents.

WILDFIRES – Vulnerability and Impacts

Because much of the county is forested, it can be vulnerable to wildfires. If a wildfire were to overwhelm the resources of municipal fire fighting organizations, homes in the wildland-urban interface could be destroyed and valuable timber lands lost.

8. Assessing Vulnerability: Addressing Repetitive Loss Properties	
Requirement §201.6(c)(2)(ii): (The risk assessment) must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged (by) floods.	
Element	**A.** Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

The State of Maine Planning Office (now part of Maine Dept of Conservation) reported, "Hancock County has no repetitive loss properties." As previously stated in other parts of this section of the plan, damage losses from flooding tend to be associated more with roads.

9. Assessing Vulnerability: Identifying Structures	
Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	
Elements	**A.** Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
	B. Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Identifying Structures

The Hazard Mitigation Plan identified critical facilities located within the County and the hazards to which these facilities are susceptible. A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

The critical infrastructure facilities identified in Hancock County are municipal offices, fire and police stations, post offices, town garages and salt/sand sheds, hospitals and clinics, electric and communication utilities, water and wastewater treatment facilities, and schools.

Please note that 90% of fire fighters are volunteers and that “fire houses” are quire often older buildings that might shelter only one fire truck. These structures should not be confused with “fire stations” that are found in more densely populated towns.

Asset Inventory by Municipality

	Town Office	Fire Houses	Police	Public Works	School	Hospitals	Sewage Treatment	Water Supply	High or Significant Dams
Amherst	1	1	-	-	-	-	-	-	-
Aurora	-	-	-	-	1	-	-	-	-
Bar Harbor	1	1	1	1	1	1	1	1	-
Blue Hill	1	1	-	-	1	1	1	1	-
Brooklin	1	1	-	-	1	-	-	-	-
Brooksville	1	1	-	-	1	-	-	-	-
Bucksport	1	1	1	1	1	-	1	1	1
Castine	1	1	-	1	1	-	1	1	-
Cranberry Isle	1	1	-	-	-	-	-	-	-
Dedham	1	1	-	-	1	-	-	-	-
Deer Isle	1	1	-	1	-	-	-	-	1
Eastbrook	1	1	-	-	1	-	-	-	-
Ellsworth	1	1	1	-	3	1	1	1	4
Franklin	1	1	-	-	-	-	-	-	-
Frenchboro	1	1	-	-	-	-	-	-	-
Gouldsboro	1	1	1	-	1	-	-	-	1
Great Pond	-	1	-	-	-	-	-	-	-
Hancock	1	1	-	-	-	-	-	-	-
Lamoine	1	1	-	-	-	-	-	-	-
Mariaville	1	1	-	-	-	-	-	-	-
Mount Desert	1	1	1	1	1	-	1	1	1
Orland	1	1	-	-	-	-	-	-	2
Osborn	1	1	-	-	-	-	-	-	-
Otis	1	1	-	-	-	-	-	-	-
Penobscot	1	1	-	-	-	-	-	-	-
Sedgwick	1	1	-	-	-	-	-	-	-
Sorrento	1	1	-	-	-	-	-	1	-
Southwest Harbor	1	1	1	1	1	-	1	1	-
Stonington	1	1	-	1	-	-	-	1	-
Sullivan	1	1	-	-	1	-	-	1	-
Surry	1	1	-	-	1	-	-	-	-
Swans Island	1	1	-	-	1	-	-	-	-
Tremont	1	1	-	1	1	-	-	-	-
Trenton	1	1	-	-	1	-	-	-	-
Verona	-	-	-	-	-	-	-	-	1
Waltham	1	1	-	-	-	-	-	-	-
Winter Harbor	1	1	1	-	-	-	2	2	-

A. Vulnerability of Existing Buildings, Infrastructure and Critical Facilities

The Hancock County Emergency Management Agency used existing Maine GIS map data and a handheld GPS data collector to map and locate the county's critical facilities and determine which are most likely to be affected by hazards. The four hazards most likely to impact the County are severe winter and summer storm events, wildland fires and flooding. The analysis revealed the following:

Severe Winter and Summer Storm Hazard: A "Northeaster", blizzard, ice storm or severe coastal storm of the severity that occurs at least once every 3-5 years would have an impact on all roads in the County and on all overhead electrical power and telephone lines. Roads may be covered in snow, washed out, or blocked with tree debris. Utility lines and poles will be felled. No critical structures were identified as in danger from a severe winter or summer storm. A coastal storm could cause general erosion and wind damage to coastal areas and buildings.

Wildland Fire Hazard: Forest fires would have a tremendous impact on the large number of homes located in the wildland-urban interface. We estimated that nearly 11,200 homes or 34% of the homes in Hancock County are located in the Wildland-Urban Interface.

Flooding Hazard: A 100-year flood would have an impact on many roadway surfaces, two major highway bridges, a municipal dock, a municipal sewer system, four fire stations, a municipal office, and a library. The most likely coastal flooding will occur with a Category 1 Hurricane. The downtown areas of Bar Harbor, Blue Hill, Castine, Gouldsboro (Prospect Harbor), Sedgwick, Southwest Harbor, Tremont and Winter Harbor, residential areas in Blue Hill, Brooksville, Castine, Cranberry Isles, Deer Isle, Frenchboro, Gouldsboro, Hancock, Lamoine, Orland, Penobscot, Sedgwick, Sorrento, Stonington, Sullivan, Surry, Swan's Island, Trenton and Winter Harbor will be impacted by a Category 1 Hurricane. Bar Harbor, Castine Village, Deer Isle, Mount Desert, Southwest Harbor, Stonington and Tremont would be cut off from the rest of the mainland.

Future Critical Facilities:

Assessing where future development will occur in the towns in Hancock County is difficult due to a lack of municipal data, policies and programs. Most of the Hancock County towns are very small and rural and do not have planning departments, building codes or even a full time code enforcement officer. There is very little commercial, industrial and public construction completed in many of these communities. Floodplain ordinances, State mandated shoreland zoning ordinance and septic system designs are about the only controlling guidance.

Severe Winter or Summer Storm Hazard: It is very unlikely that a severe winter or summer storm will have any impact on future structures. Both of these hazards primarily impact local roads and overhead utility lines.

Wildland Fire Hazard: Forest fires in Hancock County towns primarily threaten residential structures in the wildland-urban interface. In all Hancock County communities, homes are allowed to be built anywhere, in any land use zone. Some communities may decide to provide wildland fire protection information to new residents who wish to build new homes at the time they are issued a land use permit.

Flooding Hazard: The majority of damages from flooding in Hancock County affect the roads, not structures. We were unable to find any records of structures being lost in the County due to flooding in the last 65 years. However, most towns do have floodplain ordinances that provide

some control over development in flood zones. Those towns that do not have flood zone ordinances do not have any special flood hazard areas that could ever flood structures. There are primarily streams that could potentially overtop local roads and most of those would be the old gravel roads with insufficient storm drainage.

10. **ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES**

Requirement §201.6(c)(2) (ii)(B):	**The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate…**
Elements	**A. Does the new or updated plan estimate potential dollar losses to vulnerable structures?**
	B. Does the new or updated plan describe the methodology used to prepare the estimate?

Historical data was used to estimate the potential dollar losses if the County were to experience severe winter storms, flooding, summer storms, or wildfires.

- Historical damage estimates have been updated, using the Consumer Price Index shown below.
- Presidential Disaster Declarations have been used where possible, updated for inflation using the Consumer Price Index.
- Where statewide or county damages are used to determine damages for a specific jurisdiction, the damages are pro-rated using the 2010 Census.

The average annual Consumer Price Index for various years is shown below based on a value of 100 for the years 1982 – 1984.

Consumer Price Index
Provided by the U.S. Department of Labor Bureau of Labor Statistics

1961	29.9	**1971**	40.5	**1981**	90.9	**1991**	136.2	**2001**	177.1
1962	30.2	**1972**	41.8	**1982**	96.5	**1992**	140.3	**2002**	179.9
1963	30.6	**1973**	44.4	**1983**	99.6	**1993**	144.5	**2003**	184
1964	31	**1974**	49.3	**1984**	103.9	**1994**	148.2	**2004**	188.9
1965	31.5	**1975**	53.8	**1985**	107.6	**1995**	152.4	**2005**	195.3
1966	32.4	**1976**	56.9	**1986**	109.6	**1996**	156.9	**2006**	201.6
1967	33.4	**1977**	60.6	**1987**	113.6	**1997**	160.5	**2007**	207.3
1968	34.8	**1978**	65.2	**1988**	118.3	**1998**	163	**2008**	215.303
1969	36.7	**1979**	72.6	**1989**	124	**1999**	166.6	**2009**	214.537
1970	38.8	**1980**	82.4	**1990**	130.7	**2000**	172.2	**2010**	218.056
Year =	Ann. Avg.						As of Sept	**2011**	226.889

***Base year is chained; 1982-1984 = 100. The table of data is based upon a 1982 base of 100. (This means a CPI of 195.3, as an example from 2005, indicates 95.3% inflation since 1982.)**

Potential Severe Winter Storm losses:

The plan uses worst-case real-life damages to calculate potential winter storm damages assumes that historic patterns will hold for the future. For Hancock County, the worst storm is the ice storm of 1998, which resulted in a statewide Presidential Disaster Declaration for damages of $47,748,466. Using the Consumer Price Index, the $47.7 million in damages would be in 2011 dollars (multiply $47.7 million by 226.889, and divide by 163.0 – the CPI for 1998.

Winter Storm Losses in Hancock County				
	A. Actual 1998 Ice Storm Losses	B. Updated 1998 Ice Storm Losses Using 2011 CPI	C. Winter Storm Losses Based on per Capita	D. POTENTIAL Maximum Winter Storm Losses
Amherst	$ 3,638	$ 5,064	$ 12,720	$ 12,720
Aurora	$ 8,126	$ 11,311	$ 5,472	$ 8,126
Bar Harbor	$ 52,138	$ 72,574	$ 251,280	$ 251,280
Blue Hill	$ 85,293	$ 118,724	$ 128,928	$ 128,928
Brooklin	$ 5,514	$ 7,675	$ 39,552	$ 9,552
Brooksville	$ 33,721	$ 46,938	$ 44,832	$ 46,938
Bucksport	$ 100,756	$ 140,248	$ 236,352	$ 236,352
Castine	$ 35,253	$ 49,071	$ 65,568	$ 65,568
Cranberry Isle	$ -	$ -	$ 6,768	$ 6,768
Dedham	$ 52,018	$ 72,407	$ 80,688	$ 80,688
Deer Isle	$ 23,198	$ 32,291	$ 94,800	$ 94,800
Eastbrook	$ 53,930	$ 75,068	$ 20,304	$ 75,068
Ellsworth	$ 215,744	$ 300,306	$ 371,568	$ 371,568
Franklin	$ 17,504	$ 24,365	$ 71,184	$ 71,184
Frenchboro	$ -	$ -	$ 2,928	$ 2,928
Gouldsboro	$ 6,209	$ 8,643	$ 83,376	$ 83,376
Great Pond	$ -	$ -	$ 2,784	$ 2,784
Hancock	$ 22,691	$ 31,585	$ 114,912	$ 114,912
Lamoine	$ 31,547	$ 43,912	$ 76,896	$ 76,896
Mariaville	$ 21,794	$ 30,336	$ 24,624	$ 30,336
Mount Desert	$ -	$ -	$ 98,544	$ 98,544
Orland	$ 48,953	$ 68,140	$ 106,800	$ 106,800
Osborn	$ -	$ -	$ 3,216	$ 3,216
Otis	$ 18,412	$ 25,629	$ 32,256	$ 25,629
Penobscot	$ 35,149	$ 48,926	$ 60,624	$ 60,624
Sedgwick	$ 15,784	$ 21,971	$ 57,408	$ 57,408
Sorrento	$ 7,665	$ 10,669	$ 13,152	$ 13,152
Southwest Harbor	$ 10,480	$ 14,588	$ 84,672	$ 84,672
Stonington	$ 21,560	$ 30,011	$ 50,064	$ 50,064
Sullivan	$ 2,064	$ 2,873	$ 59,328	$ 59,328
Surry	$ 22,115	$ 30,783	$ 70,368	$ 70,368
Swans Island	$ -	$ -	$ 15,936	$ 15,936
Tremont	$ -	$ -	$ 75,024	$ 75,024
Trenton	$ 8,594	$ 11,962	$ 71,088	$ 71,088
Verona Island	$ 18,860	$ 26,252	$ 26,112	$ 26,252

Waltham	$ 16,121	$ 22,440	$ 16,944	$ 22,440
Winter Harbor	$ 12,432	$ 17,305	$ 24,768	$ 24,768
Unorganized Territory	$ 16,560	$ 23,051	$ 10,224	$ 23,051
Other	$ 82,435	$ 114,746	$ -	$ 114,746
Total	**$ 1,106,258**	**$ 1,539,864**	**$ 2,612,064**	**$ 2,659,136**

Other = Private/non-profits

Potential Summer Storm Losses

The worst summer storms in recent years were "Hanna" in 2008 and the 2009 and 2010 summer storms that resulted in DR-1852 and DR-1920 respectively. "Potential" maximum losses were estimated by using the highest available damage costs for each town. The towns most vulnerable to this type of storm activity tended to be located on the coast, but of course, this is no guarantee with regard to storm tracks.

Severe Summer Storm Losses in Hancock County

	A. 2008 "Hanna" Losses Using 2011 CPI (no declaration)	B. 2009 DR #1852 Losses Using 2011 CPI	C. 2010 DR# 1920 Losses Using 2011CPI	D. POTENTIAL Maximum Losses
Amherst	$ -	$ -	$ -	$ -
Aurora	$ -	$ -	$ -	$ -
Bar Harbor	$ 37,784	$ 76,013	$ -	$ 76,013
Blue Hill	$ -	$ 26,915	$ -	$ 26,915
Brooklin	$ 10,960	$ -	$ -	$ 10,960
Brooksville	$ 6,779	$ -	$ -	$ 6,779
Bucksport	$ -	$ 12,301	$ -	$ 12,301
Castine	$ 1,581	$ -	$ 499,150.19	$ 499,150
Cranberry Isles	$ -	$ -	$ -	$ -
Dedham	$ -	$ -	$ -	$ -
Deer Isle	$ -	$ -	$ -	$ -
Eastbrook	$ -	$ -	$ -	$ -
Ellsworth	$ 843	$ 3,937	$ -	$ 3,937
Franklin	$ -	$ -	$ -	$ -
Frenchboro	$ -	$ 73,426	$ -	$ 73,426
Gouldsboro	$ 68,498	$ 12,284	$ -	$ 68,498
Great Pond	$ -	$ -	$ -	$ -

Hancock	$ -	$ -	$ -	$ -
Lamoine	$ -	$ 15,043	$ -	$ 15,043
Mariaville	$ -	$ -	$ -	$ -
Mt Desert	$ 89,574	$ 15,226	$ -	$ 89,574
Orland	$ -	$ 12,907	$ -	$ 12,907
Osborn	$ -	$ -	$ -	$ -
Otis	$ -	$ -	$ -	$ -
Penobscot	$ -	$ -	$ -	$ -
Sedgwick	$ -	$ -	$ -	$ -
Sorrento	$ -	$ 1,218	$ -	$ 1,218
Southwest Harbor	$ 48,475	$ 16,321	$ -	$ 48,475
Stonington	$ 29,191	$ 5,149	$ -	$ 29,191
Sullivan	$ -	$ -	$ -	$ -
Surry	$ -	$ -	$ 2,327.96	$ 2,328
Swans Island	$ 105,381	$ 22,520	$ -	$ -
Tremont	$ 24,238	$ 25,383	$ -	$ 25,383
Trenton	$ -	$ 1,586	$ -	$ 1,586
Verona Island	$ -	$ -	$ -	$ -
Waltham	$ -	$ -	$ -	$ -
Winter Harbor	$ 16,334	$ 16,848	$ 1,363.07	$ 16,848
UT	$ -	$ -	$ -	$ -
Totals	$ 439,638	$ 337,076	$ 502,841	**$ 1,020,531**

Potential flood losses:

Until 2005, Hancock County had not been part of a flooding disaster declaration since 1993. However, the last decade saw an increase in flooding events and declarations. The three recent declarations that included Hancock County are captured in Columns A, B and C in the table below. To estimate the “Potential Maximum” flooding losses, the highest reported damages for each town was used.

Potential Flooding Losses in Hancock County				
	A. Flooding May 2005 DR # 1591	B. Flooding May 2007 DR # 1691	C. Flooding Jul 2009 DR # 1852	D. Maximum Potential Flooding Losses
Amherst	$ -	$ -	$ -	$ -
Aurora	$ -	$ -	$ -	$ -
Bar Harbor	$ 50,388	$ 34,593	$ 76,012	$ 76,012
Blue Hill	$ 211,199	$ 23,601	$ 26,915	$ 211,199
Brooklin	$ -	$ -	$ -	$ -
Brooksville	$ 15,142	$ 18,337	$ -	$ 18,337
Bucksport	$ -	$ 15,429	$ 12,301	$ 15,429
Castine	$ -	$ 1,249	$ -	$ 1,249
Cranberry Isle	$ -	$ -	$ -	$ -
Dedham	$ 47,288	$ 80,591	$ -	$ 80,591
Deer Isle	$ -	$ -	$ -	$ -
Eastbrook	$ -	$ -	$ -	$ -
Ellsworth	$ -	$ -	$ 3,937	$ 3,937
Franklin	$ 19,639	$ 27,115	$ -	$ 27,115
Frenchboro	$ 216,085	$ -	$ 73,426	$ 216,085
Gouldsboro	$ 17,220	$ 6,077	$ 12,284	$ 17,220
Great Pond	$ -	$ -	$ -	
Hancock	$ 2,421	$ -	$ -	$ 2,421
Lamoine	$ 11,428	$ 43,989	$ 15,043	$ 43,989
Mariaville	$ -	$ -	$ -	$ -
Mount Desert	$ -	$ 15,829	$ 15,226	$ 15,829
Orland	$ 17,206	$ 5,438	$ 12,907	$ 17,206
Osborn	$ -	$ -	$ -	$ -
Otis	$ -	$ -	$ -	$ -
Penobscot	$ -	$ 17,642	$ -	$ 17,642
Sedgwick	$ 101,491	$ 4,196	$ -	$ 101,491
Sorrento	$ 6,387	$ 6,105	$ 1,218	$ 6,387
Southwest Harbor	$ -	$ 5,170	$ 16,321	$ 16,321

Stonington	$ 61,088	$ -	$ 5,149	$ 61,088
Sullivan	$ -	$ 33,168	$ -	$ 33,168
Surry	$ -	$ 46,119	$ -	$ 46,119
Swans Island	$ 55,612	$ -	$ 22,520	$ 55,612
Tremont	$ -	$ 16,823	$ 25,383	$ 25,383
Trenton	$ -	$ 2,685	$ 1,586	$ 2,685
Verona Island	$ -	$ -	$ -	$ -
Waltham	$ 23,603	$ 8,344	$ -	$ 23,603
Winter Harbor	$ -	$ -	$ 16,848	$ 16,848
UT	$ -	$ 6,013	$ -	$ 6,013
Other	$ -	$ 1,094	$ -	$ 1,094
Totals	$ 856,195	$ 419,608	$ 337,075	$ 1,153,685

Potential Wildfire losses:

As previously discussed, wildfires have been kept to lower acreage burns and / or lower cost structure damages by active suppression and prevention efforts. To estimate the "Potential Maximum" of wildfire losses, the highest reported suppression costs for each town was used.

Potential Wild Fire Losses in Hancock County

Town	Acres	A. Total Cost Est. 2005 Suppression & Damages Adjusted by CPI	Acres	B. Total Cost Est. 2007 Suppression & Damages Adjusted by CPI	Acres	C. Total Cost Est. for Yr. 2008 Suppression & Damages Adjusted by CPI	D. Maximum Potential Losses from Wildfires
Amherst	6	$ 12,378					$ 12,378
Aurora					0.5	$ 1,964	$ 1,964
Blue Hill	6.5	$ 5,636	4.1	$ 1,547	2.7	$ 4,187	$ 5,636
Brooklin					1.3	$ 2,509	$ 2,509
Brooksville	2	$ 26,808	1	$ 1,707			$ 26,808
Bucksport	0.8	$ 27,869	3.6	$ 4,392	2.6	$ 5,074	$ 27,869
Dedham	0.5	$ 494	0.8	$ 225	8.7	$ 17,134	$ 17,134
Deer Isle	2	$ 3,539	0.2	$ 1,249	0.2	$ 3,776	$ 3,776
Ellsworth	9.1	$ 8,767	0.6	$ 959	2.5	$ 14,432	$ 14,432
Franklin	1.8	$ 2,518			8.3	$ 2,979	$ 2,979
Gouldsboro	0.8	$ 41,357			1	$ 2,648	$ 41,357
Great Pond	0.7	$ 2,038	23.2	$ 7,554			$ 7,554
Hancock	32.3	$ 24,232	0.1	$ 164	2.2	$ 1,868	$ 24,232
Lamoine	0.8	$ 1,341			0.1	$ 3,486	$ 3,486

Mariaville					0.3	$ 1,114	$ 1,114
Mount Desert			0.5	$ 4,755			$ 4,755
Orland			5.1	$ 7,426	14.7	$ 7,621	$ 7,621
Otis	0.5	$ 1,498			0.1	$ 471	$ 1,498
Penobscot			4.1	$ 1,139			$ 1,139
Sedgwick	3	$ 14,262	3.1	$ 2,293	5.8	$ 13,931	$ 13,931
Stonington			0.2	$ 1,230			$ 1,230
Sullivan	0.1	$ 269	0.7	$ 1,370	1.6	$ 3,335	$ 3,335
Surry			0.3	$ 1,241			$ 1,241
Swans Island	2	$ 196			0.2	$ 720	$ 720
UT	5.1	$ 7,385	19.1	$ 92,884	0.4	$ 221	$ 92,884
Waltham	4.5	$ 3,403			3.2	$ 12,780	$ 12,780
Winter Harbor	0.1	$ 633					$ 633
Totals	**78.6**	**$ 184,622**	**66.7**	**$ 130,137**	**56.4**	**$ 100,248**	**$ 334,996**

11. **ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS**

Requirement §201.6(c)(2)(ii)(C):	**The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.**

Hancock County is located along the Downeast coastline of Maine and is largely rural. Much of the County's land use is designated as Rural and is primarily forestland or farmland. The largest city, Ellsworth, which now has a year-round population of 7,741is located in the southern half of the County. The land uses within the county generally consist of: Residential, Resource Protection, Agricultural, Industrial, Institutional and Commercial areas.

The State of Maine Legislature enacted the Growth Management Act in 1989 (Title 30-A, Chapter 187, subchapter 2) which requires each community to develop a Municipal Comprehensive Plan. The municipal comprehensive plans allow development to occur in appropriate areas taking into account the environment, physical constraints, location of utility services, similarity to existing development, and proximity to flood zone areas.

The municipalities must review existing conditions and predict future needs in order to develop their own plans, policies, and ordinances. Most municipalities in Hancock County have enacted Flood zone, Shoreland Zone, and other land use ordnances, however only 2 or 3 municipal land use ordinances are consistent with State Planning Office guidelines.

Severe winter and summer storms will have little impact on all land use areas and zones within the 37 communities in Hancock County because this hazard has the primary impact of shutting down transportation and power, which will shut down business, industry, commerce and schools and stop all social and emergency services.

Flooding will have an impact on land use areas in flood zones within the 37 communities in Hancock County. This hazard has the primary impact of shutting down transportation, since it is

primarily the roads that are the object of flooding in the County. This could impact business, industry, commerce and schools and delay many social and emergency services.

The majority of the municipalities (33 of 37) and all 15 Unorganized Townships in Hancock County have current floodplain ordinances to prevent new commercial, industrial, and institutional development within flood zones. Four towns are currently not participating in the NFIP program: Amherst, Aurora, Eastbrook and Verona Island. There are some existing commercial developments within flood zones in the County, however many of these are fishing related. These businesses have been in place for many years and are upgraded to meet floodplain ordinances as the structures are renovated or replaced. Additionally, there are a number of homes and seasonal camps that are within the flood zones. Likewise, as maps are updated and these properties are mortgaged, they may be required to be upgraded in order to meet the ordinances.

Wildfires will have an impact on the residential properties located within the Wildland-Urban Interface. Because Hancock County is a very densely forested, sparsely populated area, there are a great number of homes that are at risk to destruction by forest fires. Currently, no municipality in Hancock County has wildfire restrictions or requirements on residential development.

The Hancock County Planning Commission has found that "Hancock County is facing very uneven growth", with the coastal communities having a relatively slow rate of year-round population while inland communities grow rapidly. For example, the Mount Desert Island towns had a 7% population increase between 1990 and 2000, while Mariaville experienced a 50% increase in the same time period. (Statistics can be deceiving, however. Statistically, Great Pond had an increase of 23.4% between 2001 and 2010 when the population of 47 people increased to 58 people.) Overall, the county's year-round population increased by about 50% between 1970 and 2000 compared to a 28% increase for the state as a whole. This imbalance is due in part to high coastal real estate values and taxes that force more people to move to less costly inland locations. Unfortunately, some of these cost savings are being offset by the cost of gasoline and maintenance for long commutes into the coastal employment centers.

The Hancock County Planning Commission also determined that another potential land development issue is the rapid increase in the number of second homes, whose numbers increased from 5,536 in 1970 to 10,672 in 2000. Most of these have been built in waterfront and water view locations. In many cases, these homes have been built on roads with poor access for emergency services. These homes are often converted to year-round use when the owners retire."

The Land Use Types and Growth Areas that have been designated in Hancock County are detailed in the following table:

Municipality	Land Use & Shoreland Zoning Types	Growth Areas
Amherst	Resource Protection, Stream Protection	None
Aurora	Resource Protection, Stream Protection, Limited Residential, Limited Commercial, General Development, Resource Management, Shoreland Residential	Limited Commercial, General Development
Bar Harbor	General Commercial Development, Limited Commercial/Transient Accommodations, Higher Intensity Residential Development, Moderate Intensity Residential Development, Industrial & Scientific Research & Production, Rural, and Conservation Districts	Hulls Cove, Town Hill, Bar Harbor Corridor, Ireson Hill Corridor, Scientific Research
Blue Hill	Wetlands, Commercial Fisheries & Maritime Activities, Resource Protection, Limited Residential, Limited Commercial, Stream Protection	Commercial Fisheries & Maritime Activities, Limited Commercial
Brooklin	Resource Protection, Limited Residential-Recreational, General Development, Split	General Development
Brooksville	Shoreland, Resource Protection	None
Bucksport	Commercial Fisheries, Downtown Shoreland, General Industrial, Limited Residential, Rte 1 Shoreland, Resource Protection, Rte 15 Residential & Commercial, Downtown, Rte 1 Commercial, Heavy Industrial, Industrial Park, Residential Growth, Village, Stream Protection	General Industrial, Rte 15 Residential & Commercial, Rte 1 Commercial, Industrial Park, Residential Growth
Castine	Village, Rural, Commercial, Institutional, Resource Protection, Watershed Protection Overlay	Commercial
Cranberry Isle	Water Dependent Commercial-Residential, Resource Protection, Low Density Residential, Mixed Residential, Business, Significant Wetlands	Mixed Residential, Business
Dedham	Resource Protection, Rural Residential, Commercial, Growth	Commercial, Growth
Deer Isle	Maritime, Resource Protection, General Development, Harbor, Public Use, Ponds and Islands	General Development
Eastbrook	Resource Protection, Shoreland, Rural Residential	None
Ellsworth	Urban Residential, Rural Residential, Farming, Natural Resources, Business Park, Commercial, Retail, Service, Industrial	Urban Residential, Business Park, Commercial, Retail, Service, Industrial
Franklin	Residential, Seasonal Residential, Commercial, Industrial, Municipal Facilities, Parks, Organizations, Public Utilities, Tree Growth, Agricultural, Conservation Easement, Federal	Commercial, Industrial

Frenchboro	Village	None
Gouldsboro	Resource Protection, Shoreland, General Development	U.S. Route 1 Traffic Corridor
Great Pond	Resource Protection, Stream Protection, Limited Residential, Limited Commercial, General Management, General Development	Limited Commercial, General Management, General Development
Hancock	Resource Protection, Aquifer Protection, Stream Protection, Shoreland Residential, Shoreland Development, Rural Residential, Commercial, Mobile Home, Industrial, Rural Undeveloped	Shoreland Development, Commercial, Mobile Home, Industrial
Lamoine	Rural, Agricultural, Residential Development, Limited Residential, Limited Commercial, Resource Protection, Commercial Fisheries & Maritime Activities	Residential Development, Limited Commercial
Mariaville	Resource Protection, Limited Resource Protection, Forest Resource Management, Roadside Rural Residential, Rural Development	Roadside Rural Residential
Mount Desert	Village Commercial, Shoreland Commercial, Village Residential, Residential, Shoreland Residential, Rural or Woodland, Resource Protection, Conservation	Village Commercial
Orland	Limited Residential, Limited Commercial, Commercial Fisheries & Maritime Activities, Resource Protection, Stream Protection, General Development	Limited Commercial, General Development
Osborn	Resource Protection, Stream Protection	None
Otis	Resource Protection, Limited Residential, Stream Protection	None
Penobscot	Resource Protection, Limited Residential, Stream Protection, Limited Commercial, General Development, Fisheries, Maritime	Limited Commercial, General Development
Sedgwick	Limited Residential-Recreational, Resource Protection, Water	None
Southwest Harbor	Residential Shoreland, Harbor, Marine Activity, Acadia National Park, & Resource Protection	None
Stonington	Resource Protection, Limited Residential, Stream Protection, Limited Commercial, General Development, Commercial Fisheries & Maritime Activities	Limited Commercial, General Development
Sullivan	Wetland, Stream Protection, Resource Protection, General Development, Limited Residential, Limited Commercial, Commercial Fisheries/Maritime Activity	General Development
Surry	Village, Roadside Commercial, Residential Growth, Forest & Agriculture, Water	Village, Roadside Commercial, Residential Growth
Swans Island	Fishery, Residential, Resource Protection	None

Tremont	Shoreland, Resource Protection	General Development
Trenton	Airport/Commercial/Industrial, Business Park, Gateway Commercial, Rural Commercial, Rural Development, Resource Protection, Resident, Village, Shoreland Zone	Airport/Commercial/Industrial, Business Park, Gateway Commercial, Rural Commercial, Rural Development, Village
Verona Island	Stream Protection, Resource Protection	None
Waltham	Stream Protection, Resource Protection, Limited Residential-Recreational	None
Winter Harbor	Resource Protection, Stream Protection, Residential-Recreation, Limited Residential, General Development, Rural, Federal	General Development

12. MULTI-JURISDICTIONAL RISK ASSESSMENT

Requirement §201.6(c)(2) (iii):	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
Element	A. Does the new or updated plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?

Hancock County is a mid-sized county of 54,418 people living in 1,522 square miles located along the coast of Maine within the eastern half of the state. There are 37 municipalities and 15 Unorganized Townships within the County's portion of the Unorganized Territory. All thirty-seven municipalities contributed to the risk assessment analyses performed for the Hancock County Hazard Mitigation Plan in the previous pages of this section.

Winter Storms: The Planning Team identified severe winter storms as the most significant natural risk to the entire County, followed in severity by wildland fire, then by severe summer (coastal) storms, and by generalized flooding. However, the risks vary between the two primary regions of the County - the coastal communities and the inland communities.

Flooding from Severe Summer Storms: All areas are at risk from flooding caused by coastal storms and hurricanes. However, the coastal and island communities face the greatest potential losses. The towns of Bar Harbor, Blue Hill, Brooklin, Brooksville, Castine, Cranberry Isle, Deer Isle, Gouldsboro, Hancock, Lamoine, Mount Desert, Penobscot, Sedgwick, Sorrento, Southwest Harbor, Stonington, Sullivan, Surry, Swans Island, Tremont, Trenton and Winter Harbor all have inhabited coastlines. Additionally, these communities contain 67% of the County's summer population, many of whom are seasonal visitors. The remediation of severe storms and the subsequent risks from coastal erosion and storm surge flooding identified in the Mitigation Plan is limited to these communities.

Wildfire: Although all areas are at risk from forest fires, it is the sparsely-populated areas of the northern parts of the county that could face extensive acreage losses and the communities in and around Acadia National Park, which contains 10,000 acres of forestland, that face extensive damages to homes and businesses. The northern part of the county contains fifteen unorganized townships in Hancock County's portion of the Unorganized Territory and the towns of Amherst, Aurora, Eastbrook, Great Pond, Mariaville, Osborn, and Waltham. These communities account for 3% of the County's year round population. Resources from the municipal fire departments are very limited for wildland firefighting.

BASE MAPS

This section contains a base map for each of the 36 towns, 1 city and a general base map of the county that also shows the 15 townships within Hancock County's portion of the Unorganized Territory. The maps were revised in 2011 by Lat Logic and if the layers were available, they contained the following:

Municipal Boundaries
State and Local Roads
USGS Topographical Contours
Lakes, Ponds, Rivers, Streams, and Wetlands
Locations of critical facilities
FEMA FIRM Flood zone Areas
Evacuation routes