MUNICIPAL CLIMATE ADAPTATION GUIDANCE SERIES

This guidance series was developed by Blue Sky Planning Solutions and the Lincoln County Regional Planning Commission for the Municipal Planning Assistance Program, Maine Department of Agriculture Conservation and Forestry through a collaborative effort of the following regional planning organizations:

Androscoggin Valley Council of Governments
Greater Portland Council of Governments
Hancock County Planning Commission
Kennebec Valley Council of Governments
Lincoln County Regional Planning Commission
Midcoast Council of Governments
Midcoast Regional Planning Commission
Northern Maine Development Council
Southern Maine Planning and Development Commission
Washington County Council of Governments

This guidance document was funded under awards CZM NA14NOS4190066 and NA16NOS4190018 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration or the Department of Commerce.

MUNICIPAL CLIMATE ADAPTATION GUIDANCE SERIES
SECTIONS

OVERVIEW
- Blue Sky Planning Solutions

TRANSPORTATION
- Joel Greenwood, Kennebec Valley Council of Governments
- Jay Kamm, Northern Maine Development Commission
- John Maloney Androscoggin Valley Council of Governments

WASTEWATER
- Lee Jay Feldman, Southern Maine Planning and Development Commission

DRINKING WATER
- Stephanie Carver, Greater Portland Council of Governments
- Rebeccah Schaffner, Greater Portland Council of Governments

STORMWATER MANAGEMENT
- Lee Jay Feldman, Southern Maine Planning and Development Commission

STREAM SMART
- Joel Greenwood, Kennebec Valley Council of Governments

COMPREHENSIVE PLANNING
- Stephanie Carver, Greater Portland Council of Governments

SHORELAND ZONING
- Robert Faunce, Lincoln County Regional Planning Commission

SITE PLAN REVIEW ORDINANCES
- Tom Martin, Hancock County Planning Commission
- Stephanie Carver, Greater Portland Council of Governments

SUBDIVISION ORDINANCES
- Eric Galant, Mid-Coast Regional Planning Commission
- John Maloney Androscoggin Valley Council of Governments
- Phil Carey, Municipal Planning Assistance program, DACF

2017

Municipal Climate Adaptation Guidance Series: Overview

AN OVERVIEW AND INTRODUCTION TO GUIDANCE DOCUMENTS FOR MAINE MUNICIPALITIES

MUNICPAL PLANNING ASSISTANCE PROGRAM,
MAINE DEPT. OF AGRICULTURE CONSERVATION AND FORESTRY
LINCOLN COUNTY REGIONAL PLANNING COMMISSION
BLUE SKY PLANNING SOLUTIONS

CHANGING CLIMATE CONDITIONS IN MAINE
OVERVIEW

Historical data show that Maine's climate conditions have changed over the last 100 years and models predict changing conditions into the future. Precipitation patterns have changed, extreme events occur more frequently, average temperatures are higher, and sea levels have increased. *Maine's average annual temperature has increased 3° since the late 1880's and sea level has increased 7 inches since 1915.*

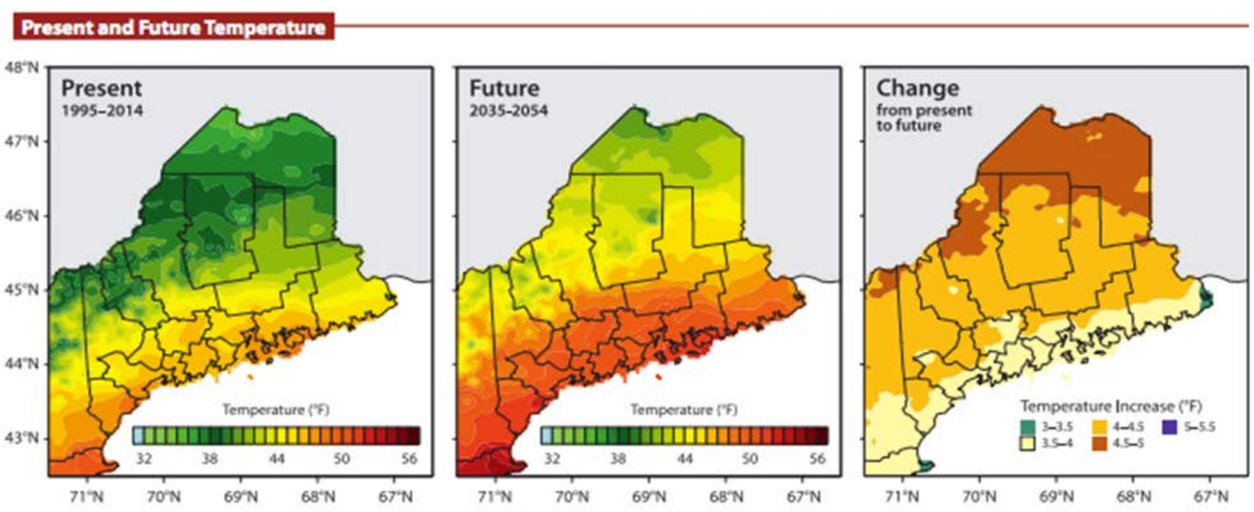


Figure 2. Maps showing mean annual temperature for 1995–2014 (left), 2035–2054 (center), and the predicted change or difference between the two time periods (right). The predicted rise in temperature by 2050 ranges 3.0–5.0 °F from the coast inland to the Canadian border. Maps derived from an ensemble simulation of the IPCC A2 emissions scenario.[1]

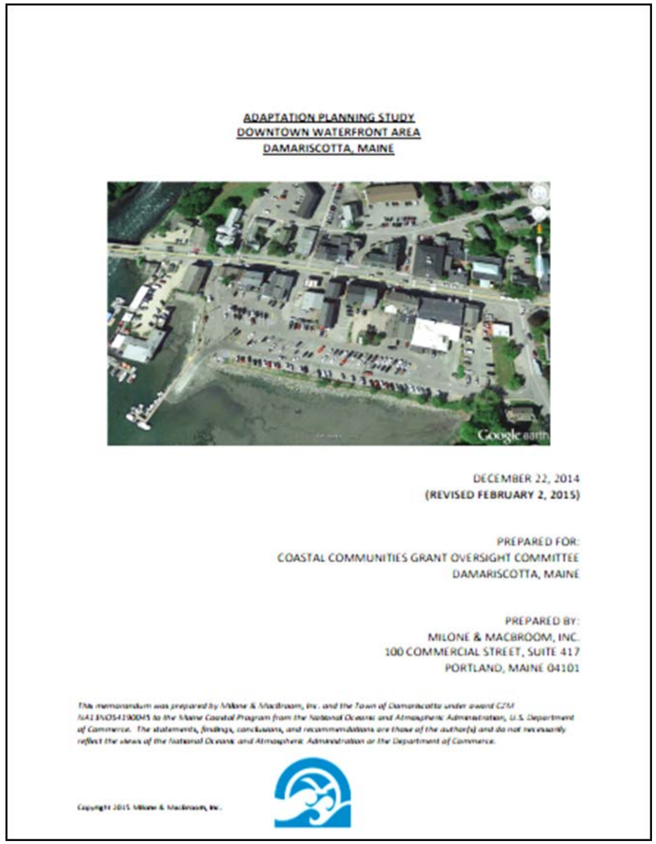
WHAT DOES THIS MEAN FOR MUNICIPALITIES?

Infrastructure built to withstand conditions based on historical data may not withstand future conditions.

- Coastal development and its portion of the current tax base are at risk from increasingly severe and frequent storm events as well as from sea level rise.
- Emergency management resources based on past events may be inadequate to meet future needs.
- Reacting to emergencies without adequate preparation is more expensive than responding based on good preparation.
- Economic disruptions from climactic events (e.g., floods, rain storms, ice storms, heat events) will become more frequent.

WHAT DOES THIS MEAN FOR MUNICIPALITIES?

Communities should decide the type of climate scenario to plan for such as 1 foot of sea level rise? 2 feet? In 25 years? 50 years?



ADAPTATION PLANNING STUDY
DOWNTOWN WATERFRONT AREA
DAMARISCOTTA, MAINE

DECEMBER 22, 2014
(REVISED FEBRUARY 2, 2015)

PREPARED FOR:
COASTAL COMMUNITIES GRANT OVERSIGHT COMMITTEE
DAMARISCOTTA, MAINE

PREPARED BY:
MILONE & MACBROOM, INC.
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PORTLAND, MAINE 04101

This memorandum was prepared by Milone & MacBroom, Inc. and the Town of Damariscotta under award CZM NA13NOS4190045 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration or the Department of Commerce.

“The (Damariscotta) Flood Resiliency Committee approved going forward with the recommendation that … would require construction of a sea wall at the 12-foot elevation *(equivalent to a 2-foot increase in sea level for the next 50 years)*.”

WHAT TO DO

The Maine Department of Agriculture Conservation and Forestry's Municipal Planning Assistance Program has worked with Regional Planning Organizations from across the state to develop a series of guidance documents to help Maine municipalities find ways to improve community resilience from sea level rise and increasing levels of precipitation by integrating climate change considerations into their existing plans, policies and regulations.

This series of documents provides suggestions for integrating climate change considerations into Maine's most commonly employed land use tools, discusses key issues for community consideration, and provides links to Maine data appropriate for use in local decision making.

DEFINITION OF CLIMATE RESILIENCE
(Wikipedia)

The capacity for a socio-ecological system to: (1) absorb stresses and maintain function in the face of external stresses imposed upon it by climate change and (2) adapt, reorganize, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future climate change impacts.

2017

Municipal Climate Adaptation Guidance Series: Transportation

JOEL GREENWOOD, KENNEBEC VALLEY COUNCIL OF GOVERNMENTSS
JAY KAMM, NOTHERN MAINE DEVELOPMENT CORPORATION
JOHN MALONEY, ANDROSCOGGIN VALLEY COUNCIL OF GOVERNMENTS

TRANSPORTATION INFRASTRUCTURE - FLOOD-RELATED THREATS TO ROADS AND DRAINAGE SYSTEMS

- Saturation and collapse of inundated road beds;
- Loss of paved surfaces through flotation or delamination;

- Washout of unpaved roadbeds;

TRANSPORTATION INFRASTRUCTURE - FLOOD-RELATED THREATS TO ROADS AND DRAINAGE SYSTEMS

- Erosion and scour of drainage ditches, sometimes to the extent of undermining shoulders and roadbeds;

- Damage to or loss of underdrain and cross-drainage pipes;

- Blockage of drainage ditches and underdrain by debris, exacerbating erosion and scour;

TRANSPORTATION INFRASTRUCTURE - FLOOD-RELATED THREATS TO ROADS AND DRAINAGE SYSTEMS

- Undermining of shoulders when ditch capacity is exceeded;

- Washout of approaches to waterway crossings; and

- Deposition of sediments on roadbeds.

TRANSPORTATION INFRASTRUCTURE - IMPACTS TO WATERWAY CROSSINGS
(BRIDGES, CULVERTS, LOW WATERWAY CROSSINGS)

- Local scour at piers and abutments with and without permanent structural damage;

- Downcutting of streambeds, which may affect bridge abutments/piers and undercut culvert inlets and outlets;

- Washout of gravel low-water crossings;

TRANSPORTATION INFRASTRUCTURE - IMPACTS TO WATERWAY CROSSINGS
(BRIDGES, CULVERTS, LOW WATERWAY CROSSINGS)

- Deposition of bed load that restricts the hydraulic capacity of crossings;

- Debris accumulation that may contribute to backup of water and damage to adjacent properties;

- Shifting of bridge decks due to pressure of rising floodwaters; and

- Shifting or migration of waterway channel alignment

KEY CONSIDERATIONS FOR INCREASING RESILIENCE IN TRANSPORTATION INFRASTRUCTURE

- Analyze a range of climate impacts over a specified period of time (scenario-based approach);
- Understand the condition of existing roads, culverts and bridges;
- Identify the assets most at risk from changing climate conditions;
- Determine how would the temporary or permanent loss of an asset affect public health and safety and vulnerable populations;
- Identify the economic impacts of service interruption?
- Determine priorities for maintenance, repair, or upgrade;

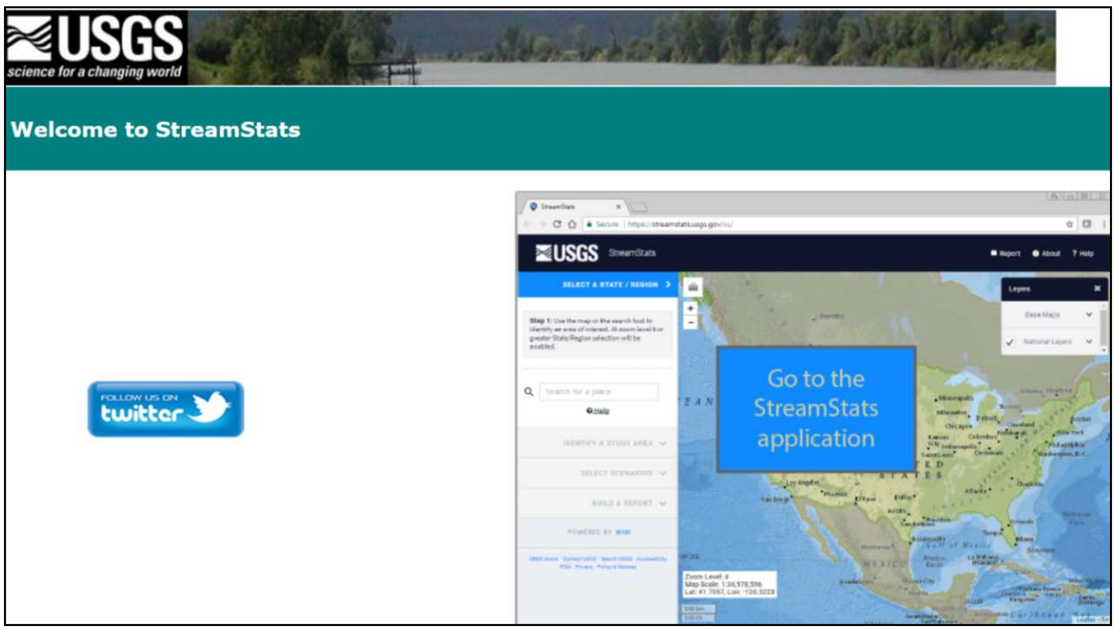
Also, make sure to:

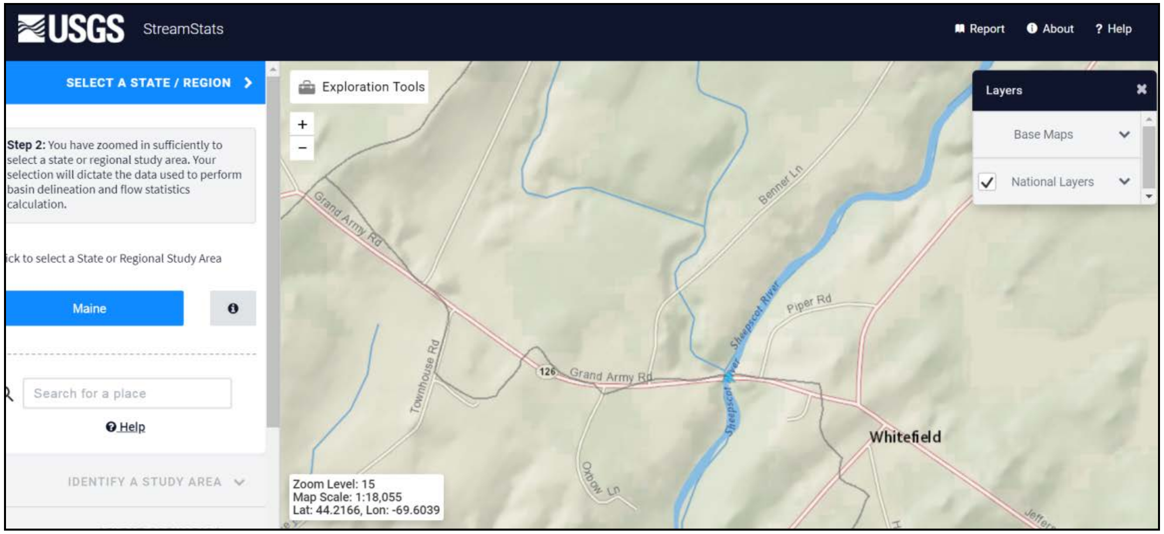
- Use <u>updated</u> precipitation data when engineering is needed;
- Culverts are traditionally sized for a 25-year storm – consider 50- or 100-year storm instead
- Refer to the MaineDOT guidelines for upgrading culverts.
- Adopt *Stream Smart Crossing* principles

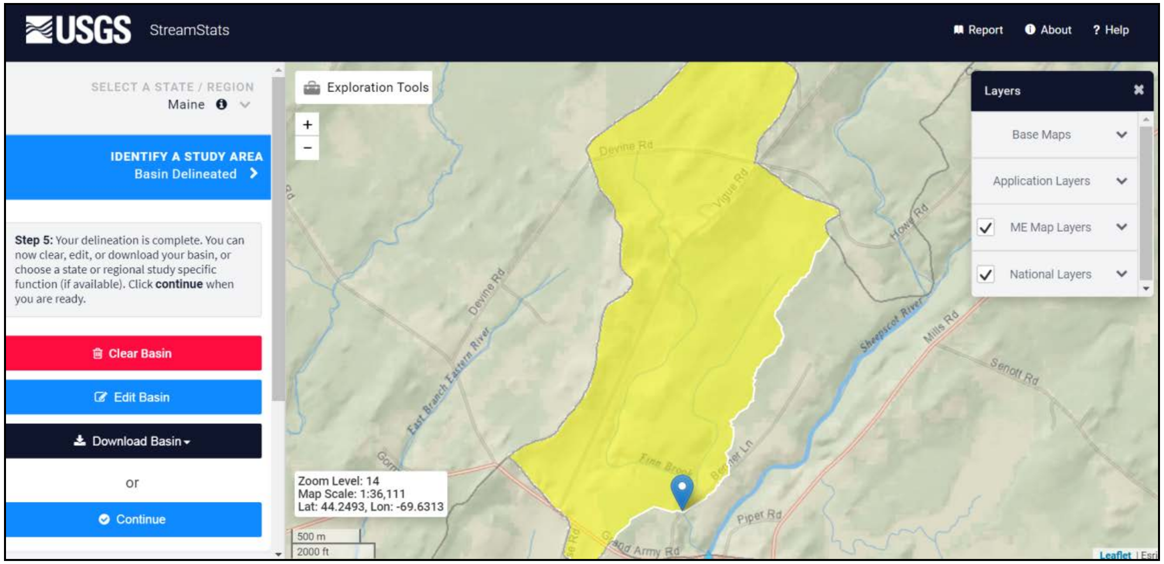
Streamstats v.4

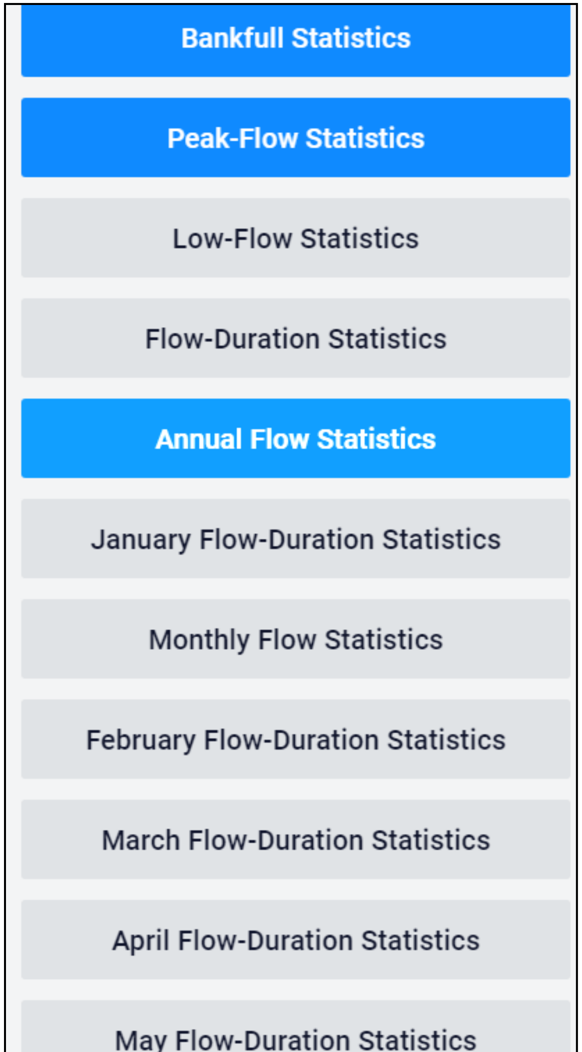
(Note – Streamstats works best with larger watersheds)

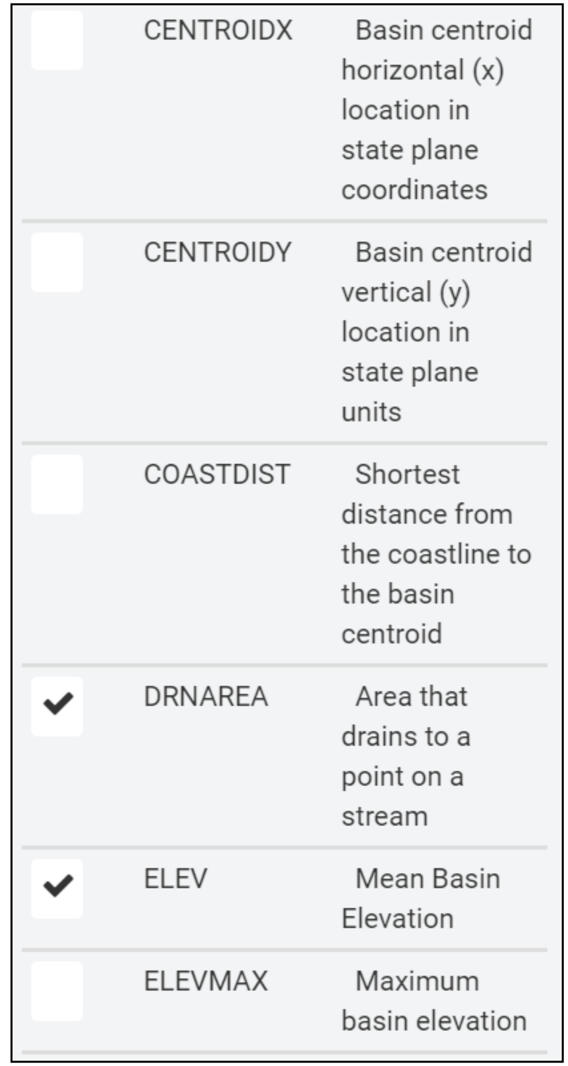
- **https://water.usgs.gov/osw/streamstats/**
- Easy to use USGS program that estimates peak flow, drainage area, bankfull width and other statistics for a medium to large stream
- These statistics can be used to provide a preliminary indication of culvert sizing but are not as accurate as an engineering drainage analysis




USGS StreamStats
Report
About
Help
SELECT A STATE / REGION
Step 2: You have zoomed in sufficiently to select a state or regional study area. Your selection will dictate the data used to perform basin delineation and flow statistics calculation.
ick to select a State or Regional Study Area
Maine
Search for a place
Help
IDENTIFY A STUDY AREA
Exploration Tools
Layers
Base Maps
National Layers
Grand Army Rd
Townhouse Rd
Benner Ln
Piper Rd
Sheepscot River
Whitefield
Oxbow Ln
Zoom Level: 15
Map Scale: 1:18,055
Lat: 44.2166, Lon: -69.6039


USGS StreamStats
Report
About
Help
SELECT A STATE / REGION
Maine
IDENTIFY A STUDY AREA
Basin Delineated
Step 5: Your delineation is complete. You can now clear, edit, or download your basin, or choose a state or regional study specific function (if available). Click continue when you are ready.
Clear Basin
Edit Basin
Download Basin
or
Continue
Exploration Tools
Layers
Base Maps
Application Layers
ME Map Layers
National Layers
Devine Rd
Vigue Rd
Hows Rd
Sheepscot River
Mills Rd
Senott Rd
East Branch Eastern River
Piper Rd
Grand Army Rd
Zoom Level: 14
Map Scale: 1:36,111
Lat: 44.2493, Lon: -69.6313
500 m
2000 ft
Leaflet | Esri


Bankfull Statistics
Peak-Flow Statistics
Low-Flow Statistics
Flow-Duration Statistics
Annual Flow Statistics
January Flow-Duration Statistics
Monthly Flow Statistics
February Flow-Duration Statistics
March Flow-Duration Statistics
April Flow-Duration Statistics
May Flow-Duration Statistics


CENTROIDX
Basin centroid horizontal (x) location in state plane coordinates
CENTROIDY
Basin centroid vertical (y) location in state plane units
COASTDIST
Shortest distance from the coastline to the basin centroid
DRNAREA
Area that drains to a point on a stream
ELEV
Mean Basin Elevation
ELEVMAX
Maximum basin elevation

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.9	square miles
STORNWI	Percentage of strorage (combined water bodies and wetlands) from the Nationa Wetlands Inventory	11.96	percent
SANDGRAVAF	Fraction of land surface underlain by sand and gravel aquifers	0.147	dimensionlesstest
ELEV	Mean Basin Elevation	197.8	feet

Bankfull Statistics Parameters [Central and Coastal Bankfull 2004 5042]

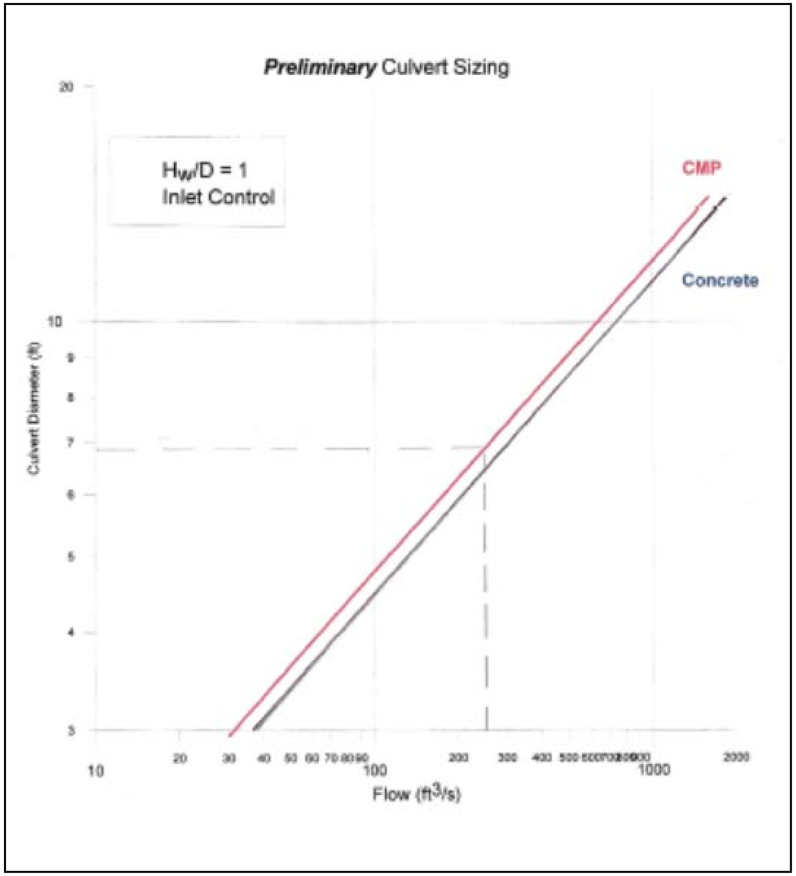
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.9	square miles	2.92	298

Bankfull Statistics Disclaimers [Central and Coastal Bankfull 2004 5042]

Bankfull Statistics Flow Report [Central and Coastal Bankfull 2004 5042]

Statistic	Value	Unit
Bankfull Streamflow	10.2	ft^3/s
Bankfull Width	10.7	ft
Bankfull Depth	0.739	ft
Bankfull Area	7.9	ft^2

Statistic	Value	Unit	SEp
1.01 Year Peak Flood	21.6	ft^3/s	38
2 Year Peak Flood	71	ft^3/s	34
5 Year Peak Flood	111	ft^3/s	35
10 Year Peak Flood	139	ft^3/s	37
25 Year Peak Flood	181	ft^3/s	39
50 Year Peak Flood	210	ft^3/s	41
100 Year Peak Flood	246	ft^3/s	42
250 Year Peak Flood	276	ft^3/s	44
500 Year Peak Flood	328	ft^3/s	47



2017

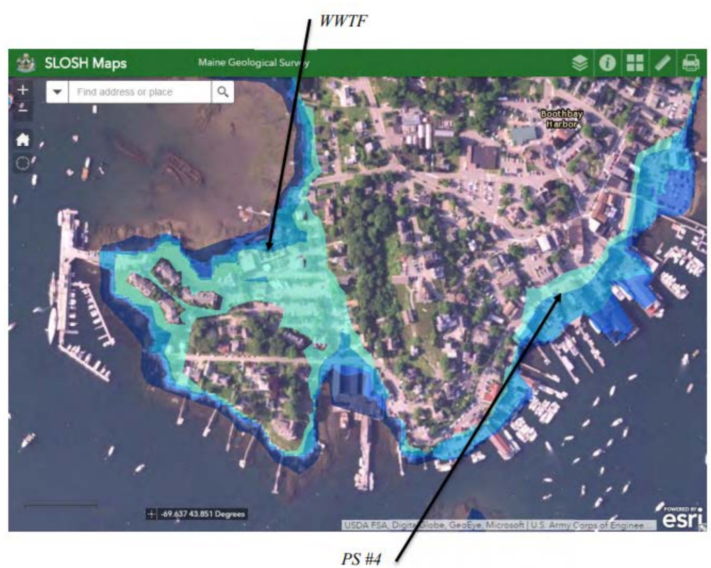
Wastewater Management and Changing Climate Conditions

A GUIDANCE DOCUMENT FOR MAINE MUNICIPALITIES

LEE JAY FELDMAN, SOUTHERN MAINE PLANNING AND DEVELOPMENT COMMISSION

KEY CONSIDERATIONS FOR IMCREASING RESILIENCE IN WASTEWATER INFRASTRUCTURE

- Public Wastewater Infrastructure is one of the most important and likely largest pieces of community infrastructure.
- Long range planning, maintenance and replacement considerations are complicated even without adding changing climate conditions.
- Regardless of the location of the wastewater plant itself, consideration needs to be given to sea-level rise, storm surge and increased storm intensity.
- The place to start is with a ***vulnerability assessment*** of the wastewater treatment and pumping stations.



VULNERABILITY ASSESSMENT AND DECISIONING MAKING FOR WASTEWATER INFRASTRUCTURE

Using the most current and best available local data:

- Examine a series of Sea-Level Rise scenarios and Storm Surge scenarios ;
- Analyze the potential impacts to the wastewater system for each scenario;
- Develop alternative scenarios for each baseline assumption and impact;
- Complete cost benefit analysis for each scenario.

This will lead to three basic courses of action beyond a ‘do nothing’ choice:

- Protect in place
- Retreat by re-aligning the wastewater system location
- Retreat by consolidating systems with a neighboring community

To incorporate resiliency:

- Use planned maintenance and repair to implement adaptation strategies;
- Investigate funding options for work beyond planned maintenance and repair.

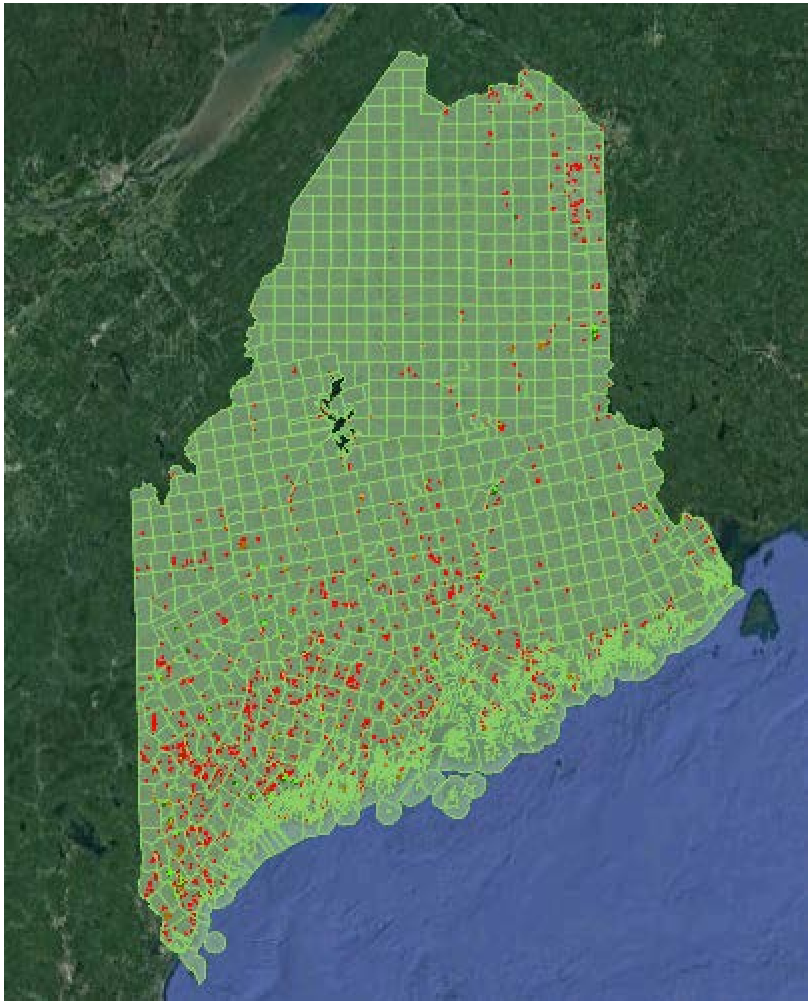
2017

Municipal Climate Adaptation Series:
Drinking Water

STEPHANIE CARVER AND REBECCAH SCHAFFNER
GREATER PORTLAND COUNCIL OF GOVERNMENTS,

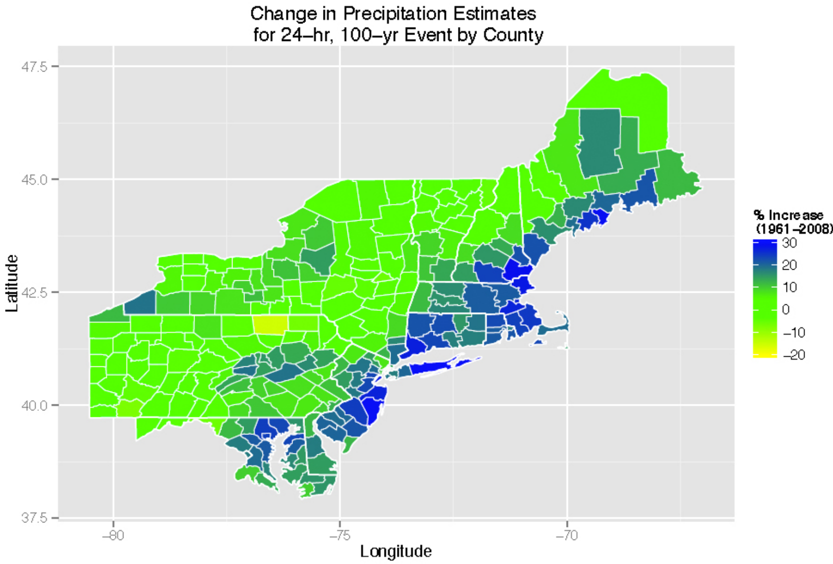
IMPACTS OF CLIMATE CHANGE ON DRINKING WATER

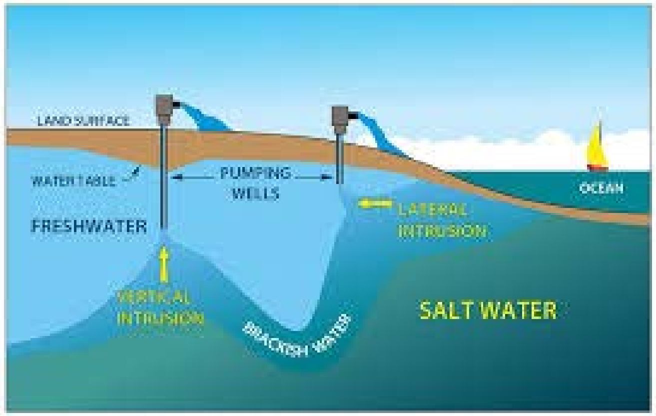
- Maine has 2200 public water systems which serve drinking water to half a million people by drawing water from more than 2600 individual water sources (wells and surface water intakes.
- The vast majority of public water systems utilize wells drilled in fractured bedrock but most *large community water systems* are supplied by wells installed into loose, unconsolidated materials such as sand and gravel or by water drawn through an intake in a lake or pond.



IMPACTS OF CLIMATE CHANGE ON DRINKING WATER

- Extreme precipitation events are occurring more frequently and with greater intensities resulting in less absorption into the ground, increased risk of flooding, and washing of sediments, pathogens, pesticides, and salt into surface waters.
- Wetter springs and falls with longer summer dry spells and decreases in snow fall can lead to decreases in groundwater recharge necessary to maintain underground aquifers and wells dependent on them.
- Rising sea level puts more and more well heads at risk for salt water intrusion





KEY CONSIDERATIONS FOR INCREASING RESILIENCE IN DRINKING WATER INFRASTRUCTURE

- Analyze range of climate impacts over specified time period (scenario-based approach);
- Assess the location and condition of all parts of the drinking water system relative to sea level rise and flooding risks;
- Determine if adaptation is needed in the face of climate impacts and if strategies exist and are cost effective;
- Use planned maintenance and repair to implement some adaptation strategies;
- Investigate funding options for work beyond planned maintenance and repair.

TOOLS TO INCREASE RESILIENCE IN DRINKING WATER INFRASTRUCTURE

EPA Climate Ready Water Utilities Initiative

- Clearing house of resources for water utilities, inclusive of wastewater and stormwater, for addressing climate change impacts.

EPA Community-Based Water Resiliency (CBWR) Tool

- Guides users through a self-assessment, provides tailored recommendations on tools and resources, offers a Water Resiliency Action Plan kit to help users plan community meetings and workshops

EPA CREAT Tool

- Downloadable software application to assist water utilities in understanding threats and vulnerabilities, options for adaptation, and impacts of adaptation strategies

Resilience Measurement Index

- Determines the resilience of critical infrastructure through evaluating preparedness, mitigation measures, response capabilities, and recovery mechanisms.

Water Safety Plan Manual

- Step-by-step risk management tool with 11 learning modules to produce a water safety plan and procedures for monitoring implementation and plan success.

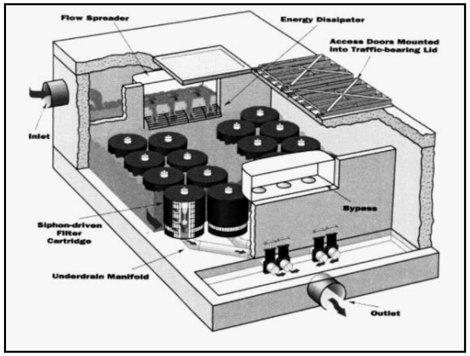
2017

Municipal Climate Adaptation Guidance Series: Stormwater Management

LEE JAY FELDMAN, SOUTHERN MAINE PLANNING AND DEVELOPMENT COMMISSION

KEY CONSIDERATIONS FOR INCREASING RESILIENCE IN STORMWATER INFRASTRUCTURE

- Flood events are increasing in frequency and intensity
- The inadequacies and expense of centralized stormwater systems and the need to remove pollutants before discharge into local waterways is forcing many communities to look beyond constructing conventional stormwater systems.
- The use of natural infrastructure, such as forests and wetlands, should be among the strategies considered in stormwater management. Putting these natural systems to work in tandem with built systems can be cost-effective and efficient.
- Forests slow runoff through friction and interception ,especially when trees are in leaf, facilitating infiltration, evaporation while wetlands and vegetated riparian floodplains moderate flooding by buffering water flows and by storing the runoff and releasing it slowly, which also aids in purification of the water.



LOW IMPACT DEVELOPMENT METHODS

- Innovations in roof designs such as green (vegetated) and blue (retains water and releases it slowly) roofs.

- Porous paving materials, such as permeable pavement or permeable pavers that allow water to infiltrate

- Biological water retention areas including rain gardens and artificial wetlands

- Vegetated buffer strips, dry or wet swales

LOW IMPACT DEVELOPMENT METHODS

- Level spreaders which are designed to disperse stormwater over a level shallow area to prevent erosion and capture sediment, often dispensing it evenly into a vegetated area for further treatment

- Stormwater planters or tree box filters

- Rain barrels or dry wells

USEPA Stormwater Calculator

(note – USEPA is updating the Stormwater Calculator – it should be back on-line summer 2018)

- The program generates site-specific pre-project stormwater flows using on-line soils, topographic, rainfall, cover and drainage data resources
- It allows the user (planning board, property owner, developer) to input existing impervious area and vegetative cover type to establish pre-project off-site stormwater flow
- The proposed development (impervious area) can then be inputted to determine post-project off-site stormwater flow
- The user can then modify the development by selecting various green-type infrastructure improvements such as rain gardens, dry wells, berms, etc., to determine how they impact off-site stormwater flow
- The user can also select various future climate scenarios to see how off-site stormwater flow may be further impacted by a changing climate
- Demo will be available at http://lcrpc.org/coastal-projects-planning/stormwater-calculator-demonstration when the Stormwater Calculator is back on-line

2017

Municipal Climate Adaptation Guidance Series: Stream Smart Crossings

JOEL GREENWOOD, KENNEBEC VALLEY COUNCIL OF GOVERNMENTS

STREAMSMART CROSSINGS

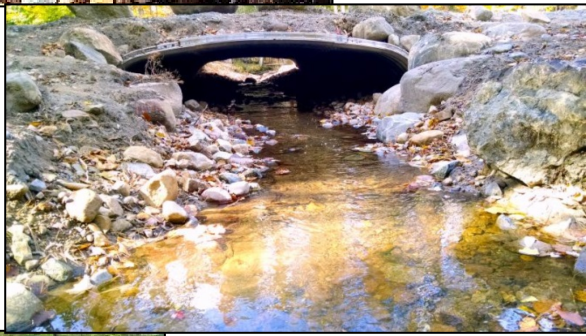
- Culverts and bridges represent the intersection of the transportation system and streams and rivers.

- 85% of wildlife species either living in or using riparian (water-related) habitats throughout the year to breed, travel, and find food and water.

- As many as 90% of the estimated 30,000 stream culverts and bridges in Maine make wildlife movement difficult or impossible at least part of the year. Typical problems include undersizing, perched inlets or outlets, excessive slope, loss of road and embankment materials into the stream, lack of suitable bottom substrate and blockage.
- **The StreamSmart Golden Rule:** ***Let the stream act like a stream. Make the road invisible to the stream.***

STREAMSMART CROSSINGS

- Principles for StreamSmart Road Crossings:
  - ✓If using a culvert, set the bottom of the structure at the natural, pre-disturbance stream bed elevation
  - ✓Size the span of the crossing to avoid pinching the stream channel and preferably, exceed the natural channel width
  - ✓Maintain natural slope and alignment of the stream channel
  - ✓Ensure that the crossing maintains natural substrate within the structure

STREAMSMART CROSSINGS

- Principles for StreamSmart Road Crossings:
  - ✓Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows
  - ✓"Openness" of the structure should be greater than 0.82 feet (0.25 meters) in order to make the structure more likely to pass small, riverine wildlife such as turtles, mink, muskrat and otter that may tend to avoid structures that appear too constricted
  - ✓Banks should be present on each side of the stream matching the horizontal profile of the existing stream and banks

2017

Municipal Climate Adaptation Guidance Series: Comprehensive Planning

STEPHANIE CARVER, GREATER PORTLAND COUNCIL OF GOVERNMENTS

CLIMATE ADAPTATION AND THE COMPREHENSIVE PLAN REVIEW CRITERIA RULE

Creating a Comprehensive Plan that is Consistent with the Maine Growth Management Act can:

- Provide legal protection for local zoning, impact fee and rate of growth (building cap) ordinances
- Can help the community qualify for or increase the competitiveness of applications for:
  - ✓Community Development Block Grants
  - ✓Land for Maine's Future
  - ✓Municipal Investment Trust Fund
  - ✓DEP 319(h) Non-Point Source Protection Grants
  - ✓DEP State Revolving Loan Fund
  - ✓Land and Water Conservation Fund
  - ✓Coastal Community Grants
- Good planning makes good communities

This Guidance Section Provides *Suggestions* for Incorporating Climate Considerations into the Following Required Comprehensive Plan Sections

- Vision Statement
- Historic and Archeological Resources
- Water Resources
- Natural Resources
- Agricultural and Forest Resources
- Marine Resources
- Population and Demographics
- Economy
- Housing
- Recreation
- Transportation
- Public Facilities
- Fiscal Capacity and Capital Investment Plan
- Existing Land Use
- Future land Use

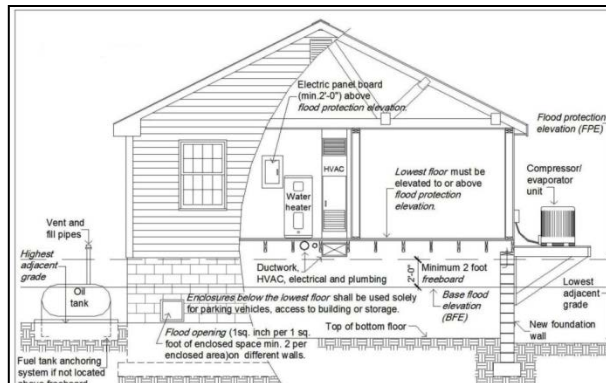
EXAMPLE OF INCORPORATING CLIMATE ADAPTATION INTO THE COMPREHENSIVE PLAN REVIEW CRITERIA RULE

8. Housing

Analysis:

- Has the community considered increasing the Base Floor Elevation (BFE) standards in areas vulnerable to flooding?

- Has the community incorporated any other building design specifications that increase resistance to impacts from sea level rise or more intense storm events?



Typical home construction in special flood hazard areas (AEzones)

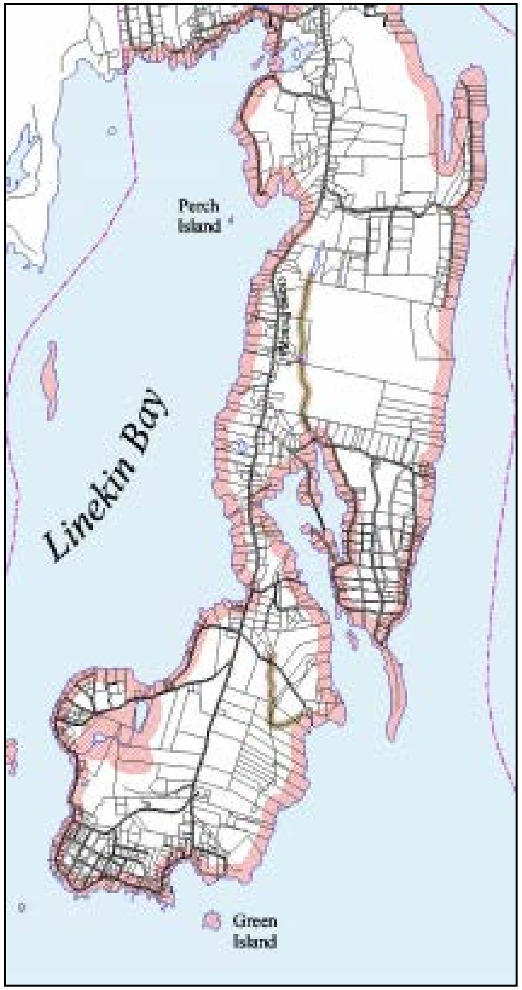
2017
2017

Municipal Climate Adaptation Guidance Series: Shoreland Zoning

ROBERT FAUNCE, LINCOLN COUNTY REGIONAL PLANNING COMMISSION

SHORELAND ZONING AND CLIMATE RESILIENCE

- All Maine communities are required adopt a local shoreland zoning ordinance consistent with the Chapter 1000 Guidelines for Municipal Shoreland Zoning Ordinances (MDEP will impose ordinances for those communities that have not adopted a local ordinance).
- A community can adopt a more stringent ordinance as long as it is equally or more effective in achieving the purposes of the Shoreland Zoning law.
- The Municipal Climate ADAPTATION Guidance Series includes suggestions for incorporating climate change into Sections 15, 16 and 17 of Chapter 1000. Communities should consult with MDEP before formally amending their shoreland zoning ordinances



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Municipal Climate Adaptation Guidance Series: Site Plan Review Ordinances

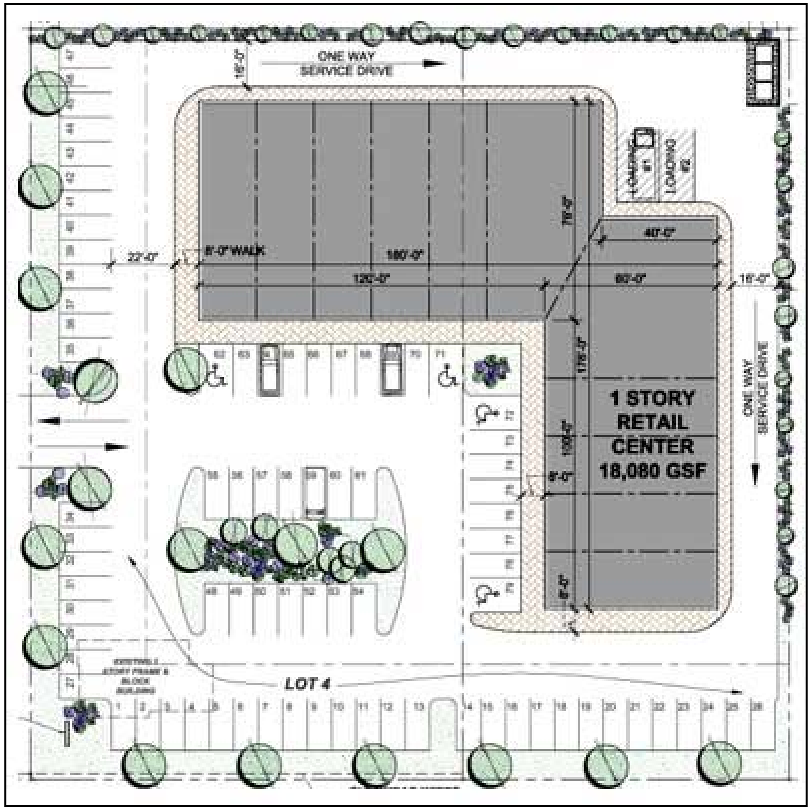
TOM MARTIN, HANCOCK COUNTY PLANNING COMMISSION
STEPHANIE CARVER, GREATER PORTLAND COUNCIL OF GOVERNMENTS

SITE PLAN REVIEW HANDBOOK AND CLIMATE RESILIENCE

- Most Maine communities have adopted a site plan review, development review or similar ordinance to govern local review and approval of projects not covered by the local subdivision ordinance or regulations.

- Site Plan Review Handbook: A Guide to Developing a Site Plan Review System, is intended to familiarize municipal officials, staff, and the public with the concept of site plan review.

- The Municipal Climate ADAPTATION Guidance Series includes suggestions for updating the Handbook to reflect the need for, and to promote, greater climate resiliency among Maine municipalities.



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Municipal Climate Adaptation Guidance Series: Subdivision Ordinances

ERIC GALANT, MID-COAST REGIONAL PLANNING COMMISSION
JOHN MALONY, ANDROSCOGGIN VALLEY COUNCIL OF GOVERNMENTS
PHIL CAREY, MUNICIPAL PLANNING ASSISTANCE PROGRAM, DACF

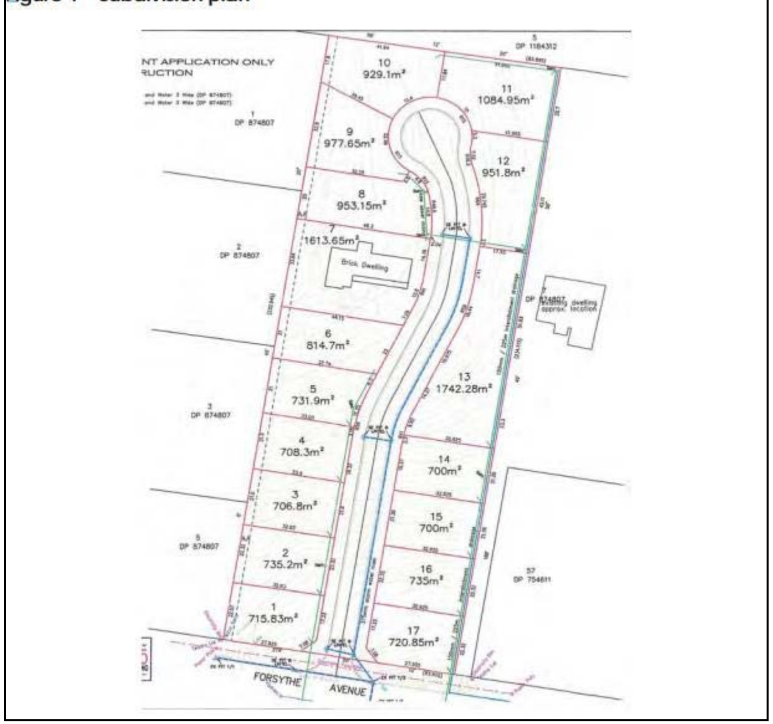
SUBDIVISION ORDINANCES AND CLIMATE RESILIENCE

- Model Subdivision Regulations for Use by Maine Planning Boards* is intended to help guide communities in developing local subdivision regulations by providing recommended language and commentaries.

- The Municipal Climate ADAPTATION Guidance Series includes revisions to the model subdivision regulations that are intended to make local subdivision ordinances and regulations more responsive to the growing need for climate resiliency.

- *(http://smrpc.org/images/Municipal_Reg_Planning/Model_Subdivision_Regulations_2006.pdf)

Figure 1 – Subdivision plan

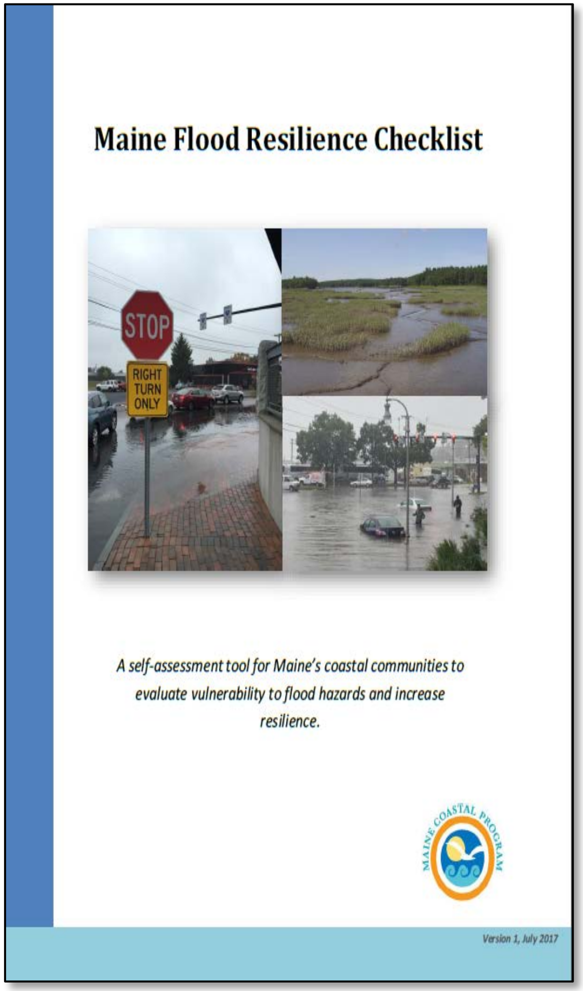


Maine Flood Resilience Checklist

THE MAINE FLOOD RESILIENCE CHECKLIST*

What Is It?

- Practical self-assessment guide designed to assist communities evaluate how well prepared they are for existing and future flood hazards
- Integrated framework for examining local flood risk, assessing vulnerability of the social, built, and natural environments, and identifying strategies for increasing resilience
- Series of 'yes' / 'no' questions organized into 5 categories
    1. Risk & Vulnerability
    2. Critical Infrastructure & Facilities
    3. Community Planning
    4. Social & Economic Vulnerability
    5. Natural Environment



*http://digitalmaine.com/mgs_publications/521/

THE MAINE FLOOD RESILIENCE CHECKLIST

Who Should Use It?

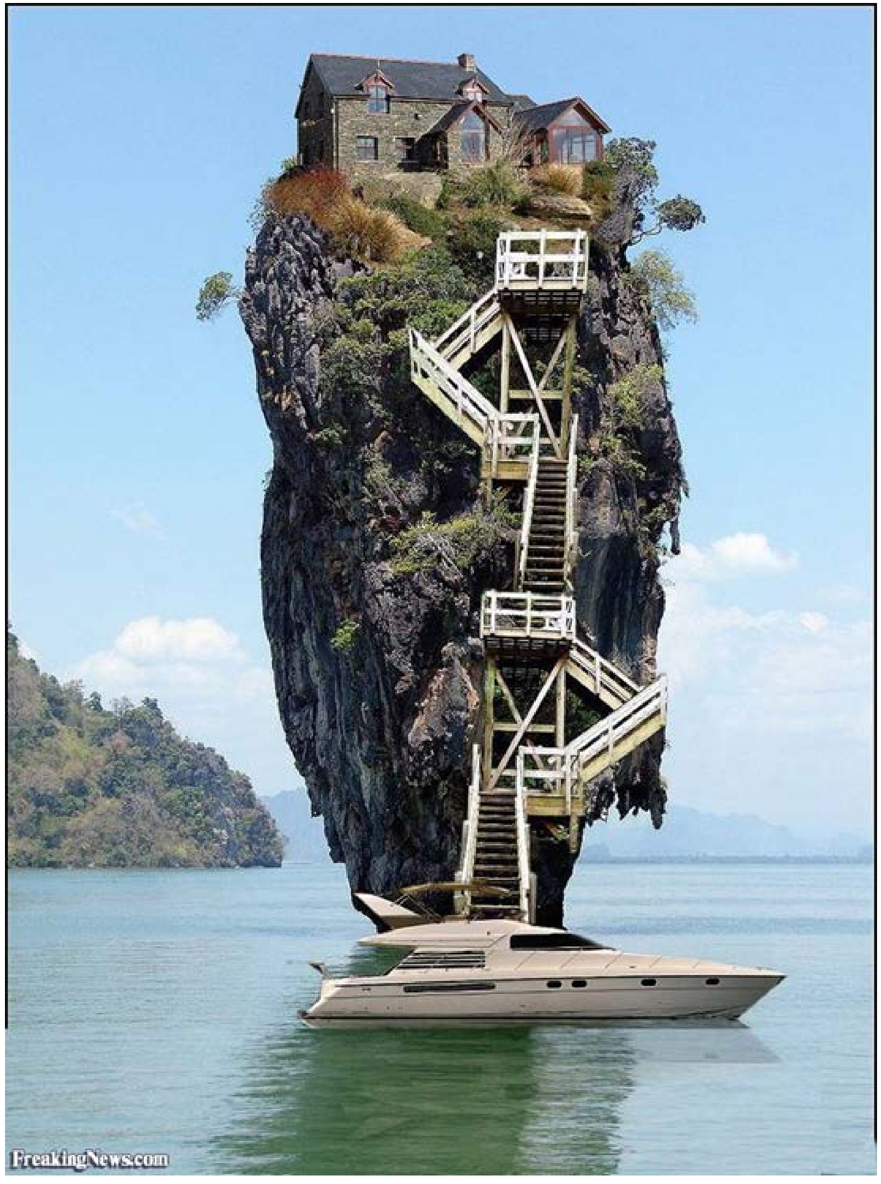
- Communities wanting to understand vulnerabilities to flood hazards and sea level rise
- Communities interested in building flood resilience
  - Community planners
  - Code enforcement officers
  - Emergency managers
  - Public safety officials
  - Economic development staff
  - Public works and engineering officials
  - Elected officials
  - Local leaders

THE MAINE FLOOD RESILIENCE CHECKLIST

What are the Benefits?

- Improve understanding of local vulnerabilities to existing and future flood hazards
- Engage a diverse group of decision-makers in discussion about flood preparedness
- Enhance information sharing across municipal departments
- Identify practical actions to improve your community's flood resilience
- Integrate flood resilience into existing planning and policies
- Identify ways to reduce flood insurance costs by earning points through the Community Rating System (CRS)

And for those who feel none of the above will be adequate ….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