

To accurately interpret the potential impacts of predicted surge, **three pieces of information are required:**

1. Storm surge prediction

Magnitude and timing: provided by Environment Canada through NS-EMO in advance of storms.

2. Predicted high tide level

High tide level and time of high tide for your area.\*

3. Mapping offset value

There are two elevation reference systems for mapping: Chart Datum (reference for nautical charts) and Canadian Geodetic Vertical Datum 1928 (reference for terrain maps).

This offset value is a constant for your area closest to you:

### Mapping Offset Values

District of Lunenburg	0.8m
Oxford-Port Howe	0.92m
District of Yarmouth	2.31m
Chignecto Isthmus	7.26m
Minas Basin	7.23m

## Not the same ole'

### Storm Tides are Changing

Storm return periods are the average time between occurrences of an event exceeding a given level/magnitude. For example, a 100-year return period storm is defined by storm characteristics that have a 1% chance of occurring in any given year.

**The amount of time between storms of a given magnitude is decreasing.** For example, the meteorological conditions that used to be associated with a storm with a 1% annual exceedance probability may have a 4% annual exceedance probability by the 2040s. In other words, in then next 30 years or so, our '100-year storms' will be our '25-year storms'.

Even if storms (both hurricanes and nor'easters) do not grow in severity, **coastal flooding will become more frequent as sea levels rise** because a smaller surge would lead to coastal flood levels equivalent to that produced by a major storm today. And, mean sea level rise in most of the Atlantic Basin is projected to be higher than global estimates.

### What Every Coastal Community Should Know

Prepared by HMC/EMC Inc. & Elemental Sustainability Consulting, with guidance from Bob Robichaud, Warning Preparedness Meteorologist, Canadian Hurricane Centre, Environment Canada

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Imagine ...

A potential Hurricane notification has been issued. The latest update indicates your area may experience a 1.3m storm surge during the height of the storm. The storm is predicted to exert maximum impacts from approximately 16:00 through 22:00 in your area.

What do you do?

# What Every Coastal Community Should Know

[Emergency Planning for Storm Surge]

## Do the Math

Once you have these three values you plug them into the equation below.

**High Tide + Predicted Storm Surge – CD/CGVD28 Offset Value = Predicted Water Level**

For example:

1.27m high tide at 21:00 hrs + 1.3m Storm surge - 0.92m offset = 1.65m CGVD28

This means, you should plan for at least a water level of 1.65m above CGVD28 during your high tide at 21:00 hours.

## There are 2 important facts to remember

- 1) Wave setup may result in somewhat higher surge, especially when large waves are involved and **high tide may not be your peak water level** if the surge is rising faster than the tide is receding.
- 2) While other factors such as winds or precipitation will affect the overall impacts, this predicted water level should give you enough data to begin identifying potential problem areas.

## Make a Map

This predicted water level still may not mean much in the absence of accurate historical data or the ability to produce a map of the impact area.

In most municipalities, Planning Technicians with GIS responsibilities can map the predicted water level. Basic digital elevation maps with water level superimposed will provide you with a first guess of the potential problem areas.

Once your map is created, you can identify areas of population density or infrastructure flooding is expected (e.g., a level of 1.65m in this case). A suggested approach would be to work with your Municipal Planners or Planning Technicians to construct a series of maps well ahead of time and keep them on file for reference as storms threaten your area.

## Record the Impacts After the Storm

Recent history will provide the most valuable information for understanding the impacts of future storm surge events. By beginning to keep track of water levels and associated storm surge impacts, future predictions will become more meaningful to you the emergency manager.

Using an **Impacts Post Event** template, record what happened in your area once the storm has passed. Reviewing your templates prior to the next event will allow you to anticipate the types of damage you may experience. By comparing predicted total water levels with previous storms, you will be able to identify whether you are likely to experience more or less impact.

Share a copy of your post-storm analysis template with Environment Canada's Warning Preparedness Meteorologist as indicated on the template. This will also help increase the accuracy of prediction and warnings.

## Where to Get the Template for Recording Impacts Post Event

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