

HALIFAX

Beach Closure Data Analysis

Presentation to Regional
Watersheds Advisory Board

March 14, 2018

Research Questions

1. Did paving the parking lots at municipal beaches cause or lead to increased closures of the associated beaches
2. Do beaches close more often after heavy rainfalls?

Datasets

1. Beach Seasons for 2009 – 2017. Internal
2. Beach Status records for 2009 – 2017. Internal
3. Parking Lot paving events. Internal
4. Meteorological records for 2009 – 2017. From Environment & Climate Change Canada, Historical Daily Data

Methodology – Parking Lots

The change of condition of parking lots, from unpaved to paved, is a discrete, one-time event.

For this exercise, only two parking lots / beaches were investigated:

1. Birch Cove Beach / Lake Banook (BCB)
2. Albro Beach / Albro Lake (AB)

Paving events occurred on the following dates:

BCB: July 30, 2009

AB: May 29, 2014

Parking Lots – Birch Cove

- NS Environment performed water quality sampling at HRM beaches through 2008;
- HRM assumed beach water quality monitoring duties in 2009
- Beach closure data recording prior to 2009 was inconsistent at best
- Consequently there is no basis upon which to determine whether the rate of closure changed following paving the lot in July 2009

Parking Lot - Albro

- HRM monitored beach seasons & closure data from 2009 through 2017 and has adequate data for consideration
- Albro beach has closed very few times since 2009:
 - 2010: July 21-27 (7 days)
 - 2013: July 4 & 5 (2 days)
 - 2017: August 2 & 3; August 11-15 (7 days)
- Based on the rarity of closure events and no clustering on either side of the paving event, there is no apparent correlation of paving and beach closures here

Rainfall & closures

- Daily rainfall amounts obtained from two sensors at the Halifax Stanfield International Airport
 - One from 2009 – 2012 (discontinued)
 - Other from 2012 through 2017 (initiated)
- Initial assessment completed only for Birch Cove Beach (Lake Banook) due to time constraints
- 2009 data excluded due to irregular beach season (closed all July due to construction & unknown status in August)

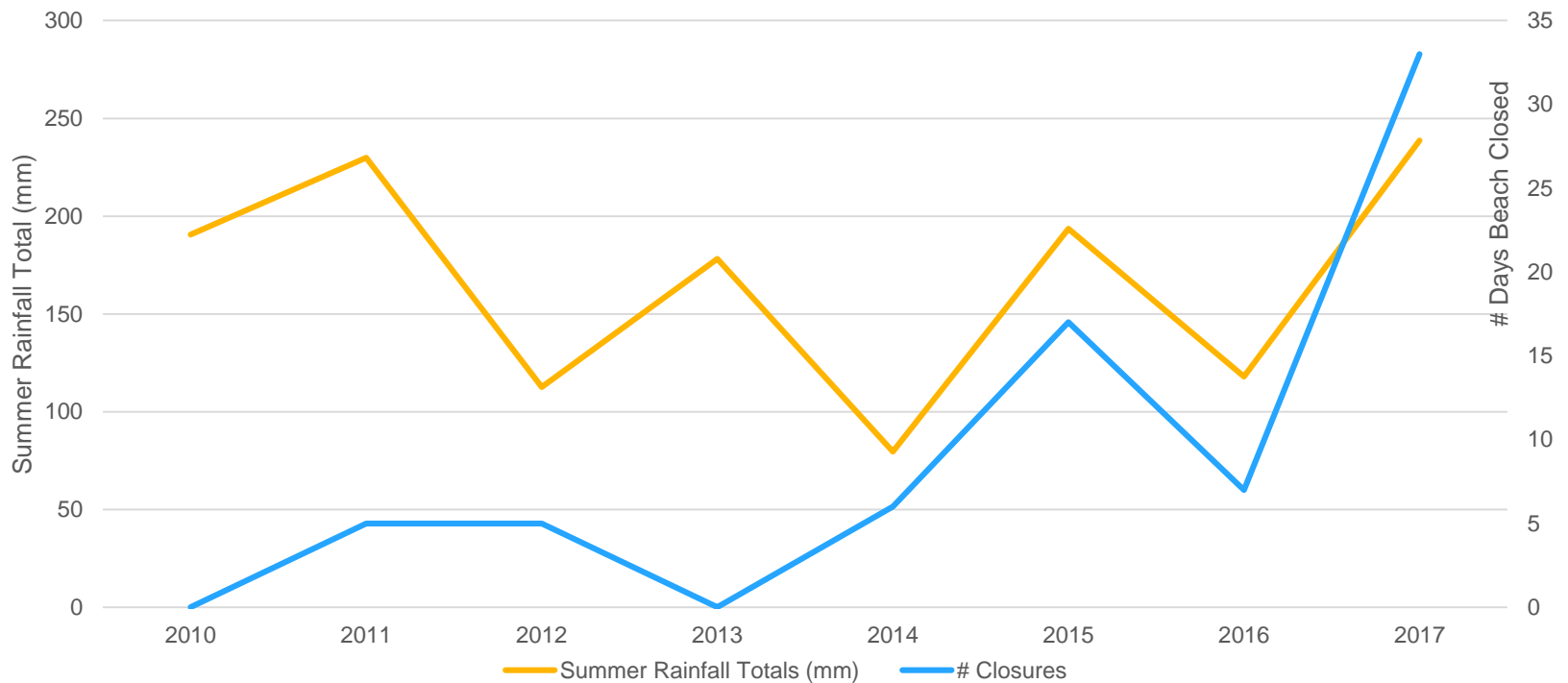
Birch Cove Beach Summary

Between 2010 and 2017:

- Beach closed **73** days
- # of 24h rainfall events $\geq 10\text{mm}$: **43**
- # rainfall events $\geq 10\text{mm}$ over 48h: **4**
- # times beach closed within 2d of 10mm threshold being met: **12**
- # times beach open when rain $\geq 10\text{mm}$ over 24h: **33**
- ... over 48h: **4**

BCB summary 2010-2017

Rainfall vs. Birch Cove Beach Closures



Birch Cove Beach- cont'd

- These results suggest no significant relationship between rainfall and beach closures
- While the data is valid, it is not been analyzed in accordance with proper to scientific & statistical principles
- These findings notwithstanding, general scientific consensus is that rainfall and beach closures ARE positively correlated

Findings Elsewhere

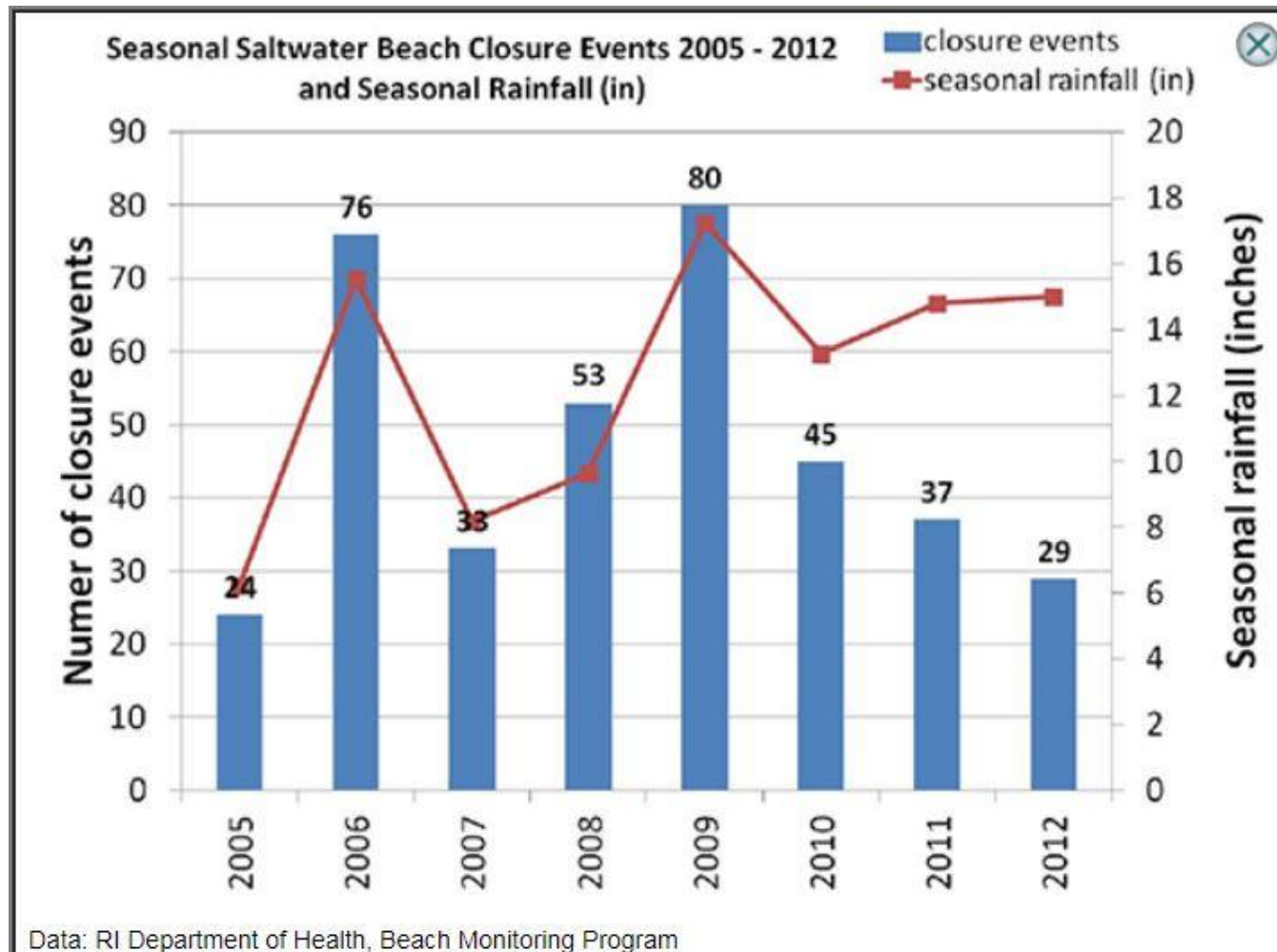
Charts comparing beach closures & rainfall

Chart 1: Rhode Island (2005-2012)

Chart 2: Rhode Island (2000-2016)

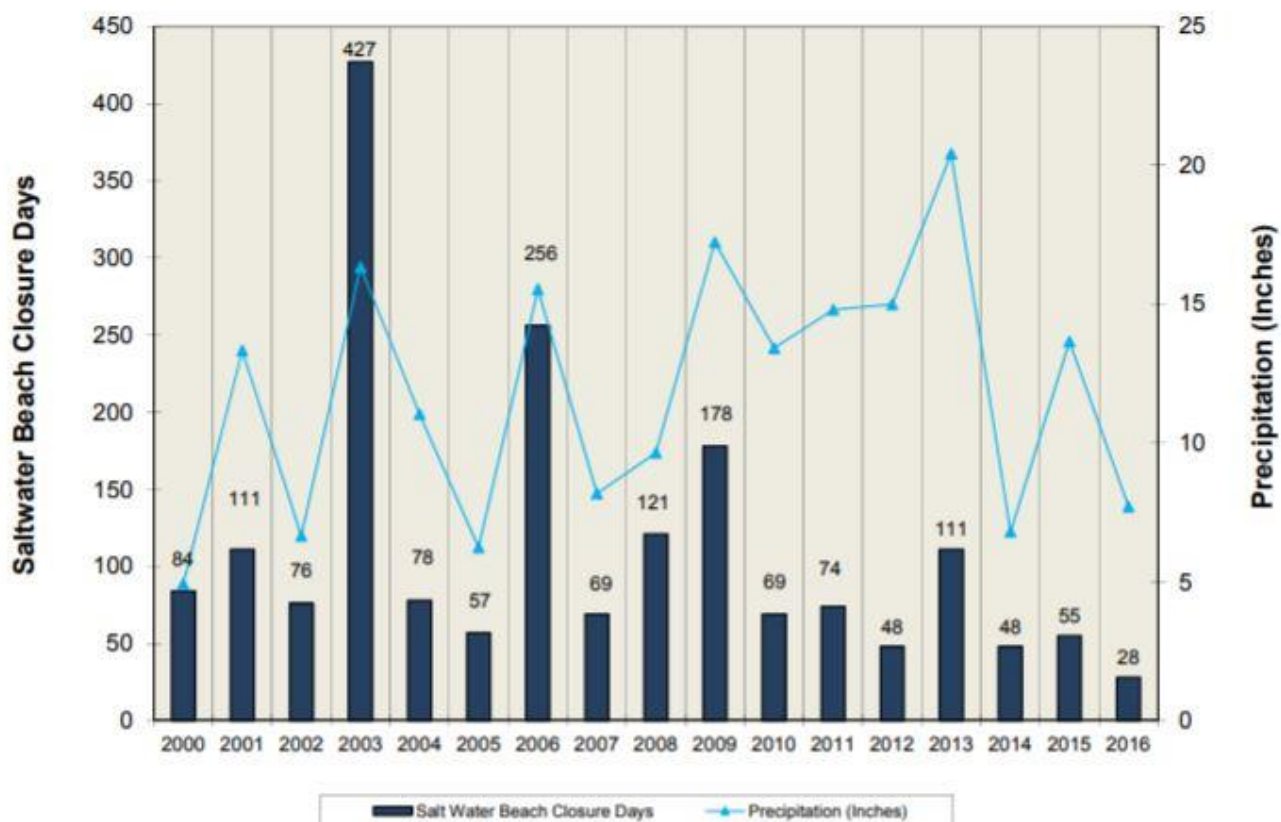
Chart 3: Long Island Sound (2002-2008)

Rhode Island Results 2005-2012



Rhode Island Results 2000-2016

Chart B: Rhode Island Saltwater Beach Closure Days and Precipitation 2000-2016



L.I. Sound results 2002-2008

