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# **Flood Risk Management in Halifax Regional Municipality**

Shannon Miedema, Energy & Environment

Flood Risk Management in Canada's Coastal Regions  
June 13, 2018

# HRM Energy & Environment

Sea Level Rise	Coastal & Overland Flooding	Stormwater Management	Water Quality Monitoring	Watershed Studies
LIDAR Acquisition	Landuse Vulnerability Mapping	Community Energy & Climate Action Plan	GHG Inventories & 2020 Target	Climate Adaptation Studies
Renewable & District Energy	Solar City Program	Energy Efficiency	Green & Blue Infrastructure	Urban Forest Master Plan
Halifax Green Network Plan	Emergency Preparedness	Resiliency	Environmental Risk Management	Invasive Species

\* Partnerships with other government departments, NGOs, academic institutions, industry, public are crucial

# Flood Risk in HRM

- Flooding (overland & coastal)
- Sea level rise
- Extreme weather events & impacts (e.g., storm surge)



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# Union Street, Bedford 2014



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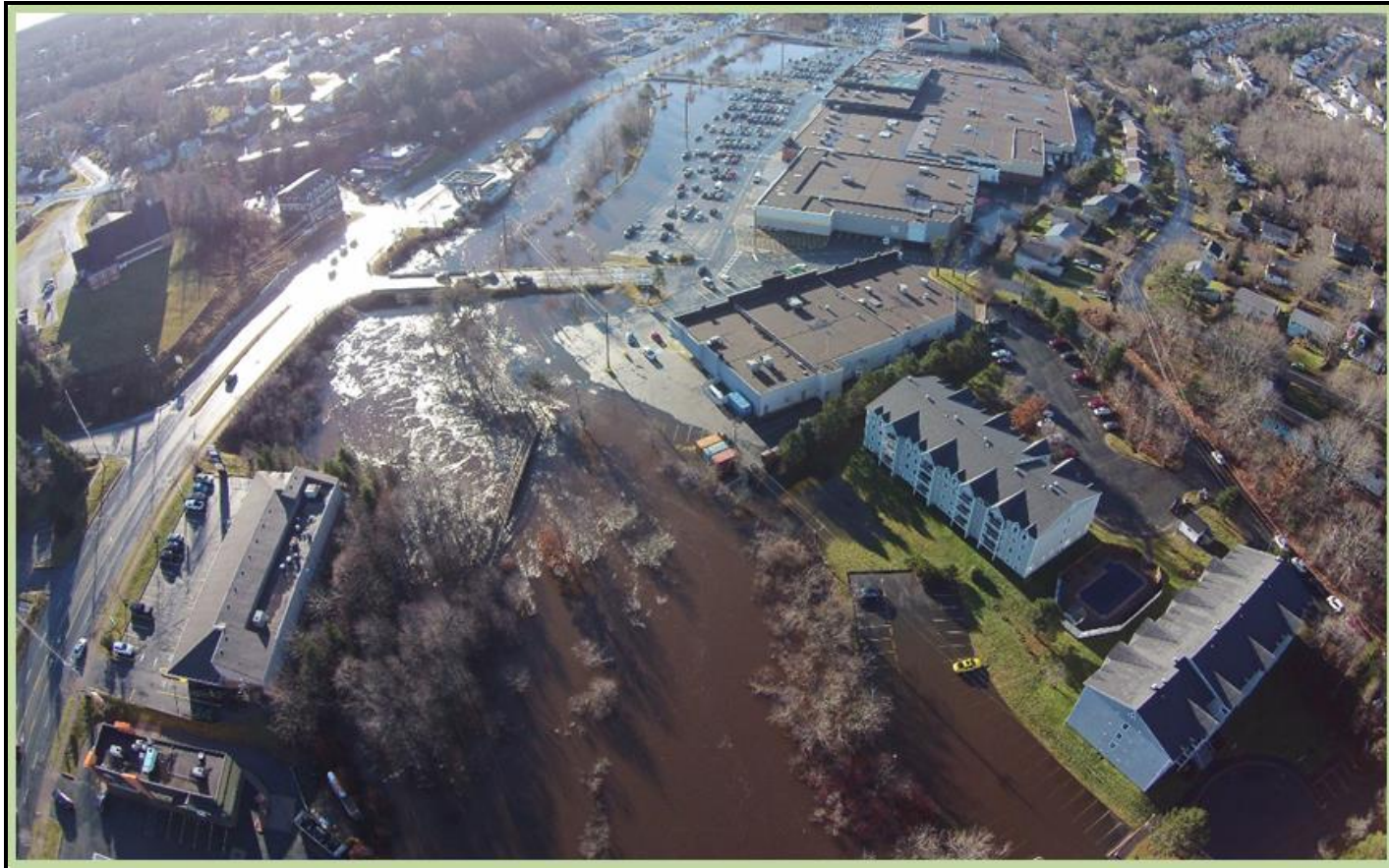


# Union Street, Bedford 1956



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# Sackville Rivers Watershed



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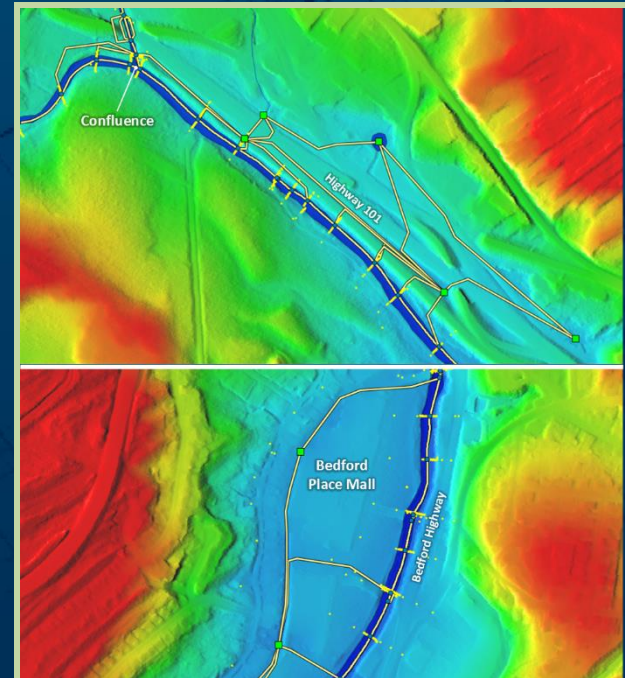
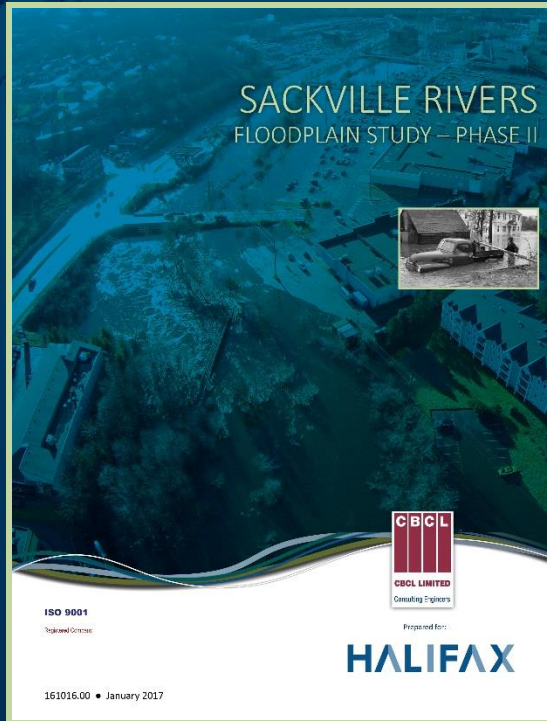




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Consulting Engineers

# Sackville Rivers Floodplain Study- Phase II Hydrological Modelling Summary



# Flood Risk Assessment Study

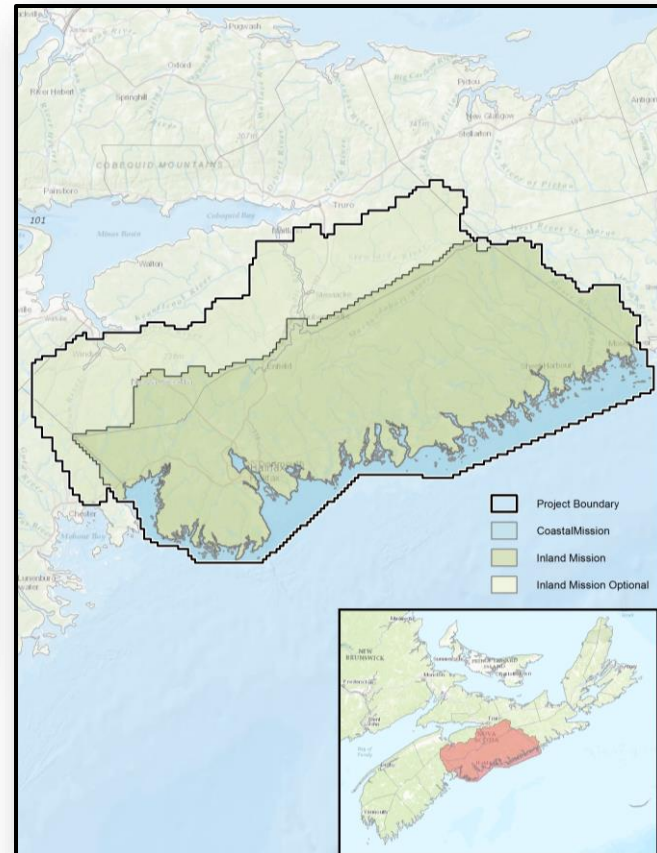
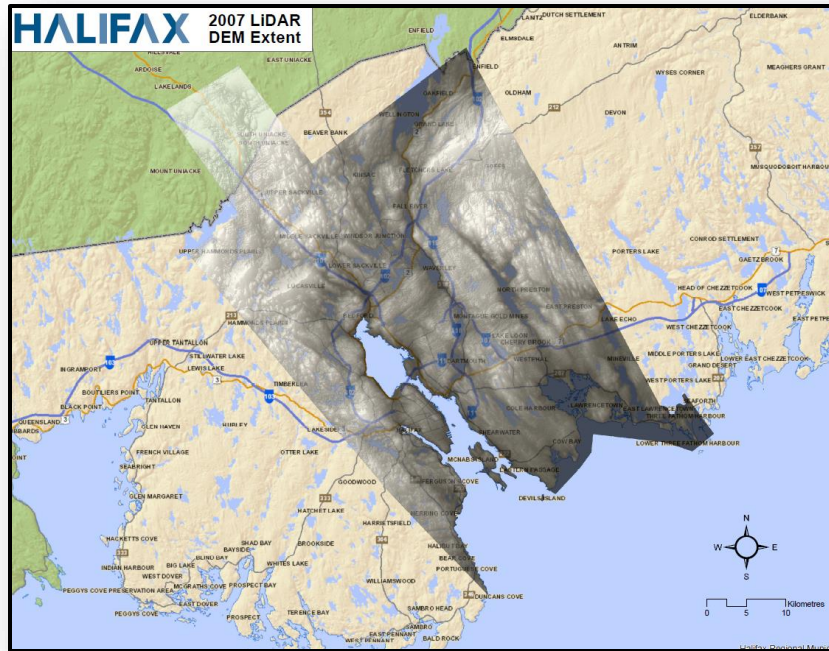
- Partnership between HRM and HW, with funding from the National Disaster Mitigation Program (NDMP).
- 2015: HRM and Halifax Water compiled a list of known areas prone to flooding within the service boundary.
- 5700 drainage issue sites were identified > 916 > 30 > top 10 priority areas for further assessment.
- Used the NDMP Risk Assessment Information Template (RAIT) by Public Safety Canada.
- Top 10 grouped by:
  - Large natural watershed systems
  - Localized drainage infrastructure
  - Tidal influenced systems



# LiDAR Acquisition & Land Use Vulnerability Assessment

- Halifax is updating and expanding its LiDAR coverage and making it publicly available
  - To cover entire HRM coastline and all major watersheds
  - Bathymetric and terrestrial LiDAR
  - Funding from NDMP
- Once processed into updated DEMs, will rerun flood scenario mapping and conduct a land use vulnerability assessment, beginning with all coastal properties.

# Updated flood risk maps expanded to entire municipality



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# Planning for Sea Level Rise

- Municipal Planning Strategy and Land Use By-law for downtown Halifax waterfront area
  - Residential ground floor elevation must be minimum 2.5 m above the ordinary high-water mark
- HRM uses Development Agreements on waterfront properties to encourage appropriate development
- Considered on a project-by-project basis e.g. with infrastructure renewal, park stewardship

# Coastal Erosion Controls - Northwest Arm Seawall



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# Other flooding initiatives

- Green Infrastructure/LID
  - Bioswale in Bedford West
  - Investigating naturalized stormwater retention ponds
  - Living shoreline pilot project
- HW-HRM Joint Stormwater Standards under development
  - Will inform a future integrated stormwater management policy
- Funding opportunities for further work

# Coastal Erosion Controls – Living Shoreline Project

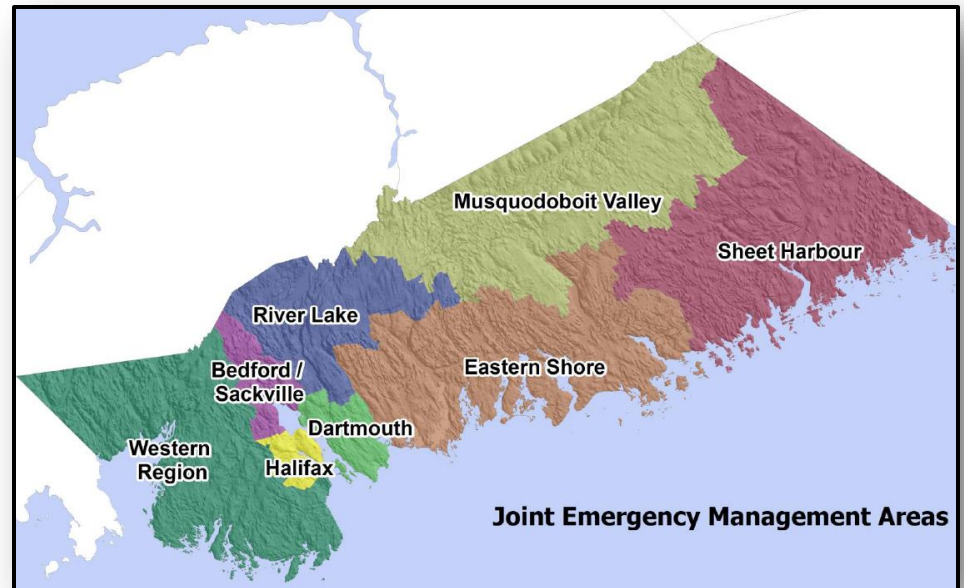


St. Mary's Boat Club, Halifax

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# Emergency Preparedness

- Hazard, Risk & Vulnerability Assessment (HRVA)
  - Includes human and natural hazards
- JEMs = Joint Emergency Management teams
  - Skilled volunteers, expanding JEM coverage
  - Access to local knowledge
  - 2-way communication
  - Builds relationships in a response
  - EMO and Energy & Environment have collaborated on climate preparedness



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# Thank You

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