
Urban rivers and flooding in northeast Avalon

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Rivers in northeast Avalon occupy bedrock valleys connecting fens, former meadows, and ponds. All are 'cascade' streams, with straight short reaches and ponds and pools that act to store sand and gravel. Pools are flushed by spring flooding. Downstream movement of sediment provides suitable spawning sites for fish, but also leads to channel obstruction that can accentuate flooding.

River valleys have been partially infilled and used for construction of roads and buildings. Flooding results from late winter rain-on-snow storms, spring snowmelt, and hurricanes. O'Leary's Brook has overflowed during several storm events in the past 10 years, resulting in flooding of the Avalon Mall. The areas surrounding the Rennies River, Quidi Vidi Lake, and Virginia River, and short cascade streams in Torbay, Portugal Cove, and Conception Bay South also are subject to flooding. More than 60 floods have occurred along the Waterford Valley since 1934. Floods may occur at any time during the year following heavy rainfalls, notably the more than 120 mm of rain brought by Tropical Storm Gabrielle in September 2001. Rapid runoff into the Waterford River from steep slopes and paved surfaces results in flooding almost immediately after any storm with more than 40 mm of rainfall within 24 hours. Flooding in the northeast Avalon would be influenced by changes in the magnitude, number, and timing of hurricane events. Overall precipitation has increased in Atlantic Canada, in accordance

with predictions from climate change models. An increase in precipitation, coupled with marginal decreases or no change in winter temperatures, would make rain-on-snow events more likely.

Flooding events are not statistically associated with overall wet years, and total annual precipitation increases do not directly imply increased flood risk. Anomalously dry years are not necessarily associated with reduced risk of flooding, and flood events are not directly associated with heavy precipitation following dry conditions. Precipitation records show annual variation in excess of 100% for Torbay. The available data does not indicate a definitive link between overall regional climate variation and flood frequency. Most flood events involve combinations of one (or more) natural causes coupled with anthropogenic factors. Drainage infrastructure that is unable to evacuate water rapidly, buildings erected in vulnerable locations, and diversions or modifications of natural drainage are common factors. Construction in upslope positions increases flood risk in lower areas. Municipal planning is critical to avoid, mitigate, or resolve anthropogenic factors contributing to flooding. Maintenance of infrastructure is a major factor in limiting damage from successive rainfall events.

Hurricanes, autumn and winter storms, spring rain-on-snow events, and ice jams are consequences of the natural environment. Even under the predicted climate change that will influence the northeast Avalon in coming decades, the styles of flooding due to natural causes will not differ in the future. Although some flooding is inevitable and unavoidable, human choices can be made that minimize community and individual vulnerability. Flood mapping, analysis, and socio-economic assessment provide information towards these goals.