Climate Change: Threats to Archaeological Sites



Building Small Island Resilience to Global Climate Change: An International Symposium Helen Kristmanson, Ph.D. and Erin Mundy, M.Sc.

September 21, 2016

PEI Aboriginal Affairs Secretariat



Aboriginal Affairs and Archaeology

Register of archaeological and paleontological sites



Archaeological Sites

Paleontological sites

ArcGIS Layers:

Inventory of registered archaeological and palaeontological sites.

Community history information.

Mi'kmaq place names.

Mi'kmaq traditional use.

Archaeological site reports.

Permit reports, MARI forms, etc.

Historical maps.

Predictive modelling.





 High proportion of coastal and watercourse sites from all chronological periods.

- Many sites have been submerged by rising sea levels and erosion.
 - storm surges.
 - less sea ice.
 - increased precipitation.
 - flooding.

Recent history/impacts on human society and archaeological resources:

- Yankee Gale, 1851.
- August Gale, 1873.
- 1870s period of higher tropical storm activity.
- October 1923 (water level high for 24 hours).
- January 2000 (widespread flooding of low lying coastal areas of PEI).
- October and Nov. 2000 (widespread flooding and damage to North shore and west coast of PEI).
- Millennia of unrecorded events

PEI archaeology coastal change study (2016)



Archaeological sites – high erosion/low elevation





http://climate.geologist-1011.net/HoloceneTemperatures.png

Peopling of the Maritimes – Paleo-Indian Period



Paleo-Indian site: Tryon, PEI



A

Paleo-Indian environment



- Resource rich periglacial environment.
- Tundra-like.
- Non-arboreal birch, willow, Artemisia and upland grasses and sedges.
- Environment suitable for migrating caribou.
- Using glacial ice to preserve food?

Northumbria – Archaic Period, 9500 BP



At ~9000 C14 years BP, ancient PEI had a surface area (joined to mainland).



Ground stone tools – butchering, symbolic, and woodworking

Jones site, Archaic Period, 9500 BP





Pitawelkek site, Georges Island Woodland Period



Ramah, CdCw-7

Pitawelkek, CdCw-5

Iron Rock, CdCw-6

Photo: Evan MacDonald, 2015



Photo: Evan MacDonald, 2015

Pitawelkek Site, Georges Island, c. 2000 years old



.~2.195 cm/year since 1934.

Pointe-aux-Vieux (CdCx-5)

Pointe-aux-Vieux (CdCx-5)

Acadian settlement at Malpeque.

1728 - 1758

Map credit: Doug Sobey

Pointe-aux-Vieux (CdCx-5)

RChngMYr

NOTES BY THE WAY A Visit to The Old Episcopal Church. FRENCH BURYING PLACE The Graves of Nearly All Of The Early Settlers Washed Away.

An hour or two after my arrival in Port Hill 1 de ermided to take advani-age of the few hours which 1 had to spend, and as 1 d ow near 1 thought that the pl ce, that would be my abode, was quiet and p: rhaps a contrast to the erwinde transpare on the crowded streets of city life.

ersiwded streets of eity life. I shall not enfertiin your readers with many trilling descriptions of sights. Whenever I do diverge from the track I have prescribed to myself, it will be to point out something. Still one can bardly visit Port Hill without saying something of the material, and shall take this cession to refer briefly to some points that impressed me after y are absence. years' absence.

Securing a team we drove to the Episcolal Church. We entered the Episcoj al Church. We entered the church yard by a small gate, and it was a strange eensation to find one's solt in the midst of tablats bearing the, epit-aphe of many of these whom I know when a boy. I can only liken it to the omotion one night fool in unexpectedly

Archaeological investigations (2008 – 2010)

December 2010 storms

Rusticoville Bridge (Photo: Don Jardine 2010)

MacLean's Bridge, Lot 11 (Photo: Robert Henderson)

Oyster Bed Bridge (Photo: Don Jardine 2010)

Storm Surge Facts

- December 21, 2010 Full moon and lunar eclipse
- High tide Charlottetown at 11:22 and 22:05 and North Rustico at 17:27.
- Third Monday northeaster in as many weeks
- Strong NE winds gusting over 100km/hr
- Waves over 5 m in height
- Tide gauge at Charlottetown shows a peak level of 3.494 metres above chart datum at 21:40.
- Tide gauge at Shediac, NB was destroyed by this storm surge.

Don Jardine 2010

'After'

'After' (December 2010)

In your opinion, how important is it to protect archaeological sites?

1/265 = not important (0.4%) 18/265 = somewhat important (6.8%) 247/265 = very important (93%)