



# Annual Report of Research and Monitoring in the Greater Kejimikujik Ecosystem 2005



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## Rationale

The use of trees and tree rings to understand past climates, biological processes, adaptations to change and forest evolution through time, is one of the few techniques that can illuminate all of these research areas on an annual basis. Because of the fine scale resolution in past records that tree-ring analysis (dendrochronology) provides, it is seen as a very strong technique to further understand the past environment in southwestern Nova Scotia. Understanding the past growth dynamics enables modelling and assessment of the future dynamics of forests and their inhabitants, specifically which species might be able to adapt to the changing ecosystems easier, and which cannot.



Students coring trees in a pine forest near Atkin's Brook, Kejimikujik (photo by C.Laroque).

# Research

## TREE-RING ANALYSIS

### OBJECTIVES

- To obtain core samples from all species of coniferous trees in the region to establish climate/growth relationships between radial-tree growth and the instrumental record.
- To establish long-term proxy climate records for targeted species whose radial growth/climate relationships are key to the Blanding's Turtle Recovery Team program.
- To combine climate/growth relationships with future climate change scenarios to forecast tree species ability to adapt to future changes in climate.

### METHODS

- Selected tree species and sites were identified and increment cores were collected from the region.
- Samples were analyzed in the Mount Allison Dendrochronology Laboratory (MAD Lab) and rings were measured to a thousandth of a mm.
- All conifer tree species were pattern matched to establish each species overall growth characteristics.
- Climate/tree-ring relationships were developed for each species.

### RESULTS

- Balsam fir is the best climate predictor species, but this species has the youngest trees in the region.
- Eastern hemlock is the oldest tree species in the region, but is a poor climate predictor.
- White pine and Larch are temperature sensitive species.
- Eastern hemlock and Balsam fir are precipitation sensitive species.
- Red spruce is a generalist species that shares commonalities with both temperature and precipitation groups.



Forest edge along a Blanding's Turtle nesting beach near Atkin's Brook, Kejimikujik (photo by C.Laroque).

## YEARS OF DATA

- 2004-2009

## PARTNERS

- Mount Allison Dendrochronology Lab
- Acadia University
- Atlantic Centre for Global and Ecosystem Research
- Natural Sciences and Engineering Research Council of Canada



M.Richard coring a hemlock near McGowan Lake, Nova Scotia (photo by C.Laroque).



Forest edges near the Pleasant River Meadows which are known Blanding's turtle habitat (photo by C.Laroque).

## CONTACTS

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