



# Canadian Forest Service Atlantic Forestry Centre – Making a Difference

## Acadia Research Forest: An outdoor classroom for forestry education

The Acadia Research Forest (ARF) was founded in 1933 by the Dominion Forest Service, a predecessor of the Canadian Forest Service (CFS). The 9,000 hectare ARF is representative of the Acadian forest region that is the predominant forest type of the Maritime provinces. It is managed by the Atlantic Forestry Centre and is located about 20 kilometres (km) east of Fredericton, New Brunswick.

The original purpose of the ARF was to be an outdoor laboratory for forestry research and provide researchers with secure, long-term research sites. The oldest maintained research sites at ARF are direct seedling trials that were established in 1923.

Other research activities include studies on:

- climate change
- insect and disease life cycles and control
- tree growth
- timber harvest methods
- tree improvement
- biodiversity

The ARF contains more than 600 plantations, hundreds of research sites, and 9 ecological reserves. The primary users of the ARF are CFS scientists but researchers from other government departments, universities and the private sector also use the ARF for a wide range of research activities.



Acadia Research Forest



Stream electrofishing by MCFT students

### Education and training

Education and training have been an integral part of the ARF from its very beginning. In 1938, short courses in forestry were offered to selected young farmers from the Maritime provinces, and in 1939 the National Forestry Program (NFP) was started.

The NFP was a three-month intensive program to teach forestry and citizenship to young men. The beginning of World War II brought an early end to what was a very successful program but the value of the research forest as an educational, training, and demonstration facility was already firmly established.

The proximity of the ARF to Fredericton and the forestry programs at the University of New Brunswick (UNB) and the Maritime College of Forest Technology (MCFT) make the ARF an excellent venue for these two renowned institutions. The faculty of forestry at UNB routinely uses the ARF for both a field site for their undergraduate program and a location for research projects. The MCFT uses the ARF as a field site to teach ecology, silviculture, road construction, and bridge and culvert installations. In their fall wildlife camp, students learn how to conduct stream and lake surveys, band waterfowl, study wetland ecology and monitor wildlife species.

## New opportunities

Collaboration has always been an integral part of the research activities at the ARF. Allowing researchers from other organizations to work with the CFS at this research field station has resulted in some exciting partnerships. Several important projects that have been undertaken in recent years demonstrate the value of the ARF as a location for research, training and education.

## Accuair Wind Tunnel

The Accuair® Wind Tunnel is a state-of-the-art facility – and is one of only three in the world. The wind tunnel is being used to measure how pesticides are dispersed when they are sprayed from an airplane under various flying conditions.

Before 2003, the wind tunnel functioned as a portable research unit but has since been made a permanent fixture at the ARF.

Originally named after its founders – Mr. H.J. (Bud) Irving and Dr. Jules J.C. Picot – the Accuair Wind Tunnel is now owned, operated and managed by Forest Protection Limited.

## Enhanced forest inventory

LiDAR (Light Detection and Ranging) technology is changing how forest inventory is carried out, and the ARF is contributing to this change. Leading Edge Geomatics, a Fredericton-based company that offers a full range of cutting-edge products including LiDAR and digital imagery, has used the ARF as a testing ground for equipment and the development of their products. As a result, LiDAR has been acquired at different intensities over the past few years for the entire ARF. The information is being used to highlight and promote the power of using LiDAR technology for forestry applications.

## Ecological monitoring tower

In 2013, a new ecological monitoring tower was launched. The 31-m tower is equipped with a full suite of meteorological equipment to measure carbon fluxes as well as water and energy exchange in the air and soil. Instruments measure and record the levels of CO<sub>2</sub>, solar radiation, precipitation, wind, temperature, humidity and atmospheric pressure.

UNB and the Atlantic Forestry Centre are co-managers of the tower, which provides an outdoor laboratory for scientists from both



ARF ecological monitoring tower

institutions. UNB and the MCFT use the tower for training graduate and undergraduate students.

The ecological monitoring tower is a valuable addition to the capacity that the ARF provides as a site for long-term research.

## Geomagnetic calibration facility

The latest addition to the ARF's suite of high-tech installations is a geomagnetic calibration facility that is scheduled for completion in 2016. This specialized facility will be used to calibrate equipment in the national geomagnetic observatory network that monitors, forecasts and reports on the earth's magnetic field and on space

weather, which can cause disturbances such as power outages and disruptions to GPS navigation systems.

The importance of the ARF as a secure place to conduct long-term research and as a demonstration, training and educational facility has never been greater. The ARF and other research forests, such as the Petawawa Research Forest in Ontario, fulfill a valuable role in addressing the needs of Canada's forest industry and contribute to the competitiveness of Canada's forest sector. The knowledge gained from research conducted at the ARF will continue to enhance forest management practices and aid in forest policy decision-making.

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