

WILLIAM S. COOPER AWARD



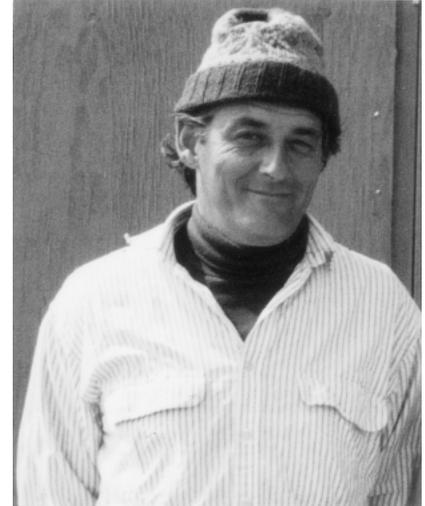
Dominique Arseneault and Serge Payette

The William S. Cooper Award is given by the Society for recent contributions in geobotany, physiographic ecology, plant succession, or the distribution of organisms along environmental gradients. The 1999 recipients are Drs. Dominique Arseneault and Serge Payette for their 1997 paper, "Landscape change following deforestation at the arctic tree line in Québec, Canada", which appeared in *Ecology* 78:693–706.

This article presents a dendroecological reconstruction of ecosystem response to a natural experiment—an AD 1568 forest fire—that resulted in the deforestation of part of the study area. Through a tremendous field work effort in a very remote setting, including tree-ring analysis of over 1000 live and preserved dead spruce trees, the authors showed how the effects of disturbance were propagated to other stands across the landscape that were not

burned by the 1568 fire. When the fire burned one stand, snow thickness was reduced in the following winters due to lack of the wind-break effect of the trees, causing less insulation of the ground and development of permafrost. The permafrost in turn resulted in formation of standing water that killed any remaining trees. This tree cover-snow-permafrost feedback spread to adjacent unburned stands, sometimes within a few years, and in other cases over several decades. The rate of spread depended on the physiographic setting of each stand.

This study is highly appropriate for the W. S. Cooper Award because it specifically demonstrates how disturbances interact with physiographic features, such as landforms and soil types, to influence the structure and successional trajectory of vegetation. This examination incorporated more dimensions than most such studies, by explicitly tracing the ecological influences of disturbance on a variety of physiographic settings, at a time



of climatic change (the Little Ice Age), across space and time.

The winning paper is one of the gems among a series of papers over the last several years on the dynamics of subarctic forests in Québec, by these two authors and others at the Centre d'Études Nordiques and Département de Biologie, Université Laval, in Saint-Foy, Québec, Canada. Co-author Serge Payette remains at that institution as a professor and editor of the journal *Écoscience*; senior author Dominique Arseneault is currently a professor at the Département de Biologie, Université du Québec à Rimouski, Québec. The winning paper gives us one of the most complete stories on disturbance-vegetation dynamics to be published in recent years. We should look forward to future publications on other aspects of subarctic spruce forest dynamics by these two talented scientists.

William S. Cooper Subcommittee

Lee E. Frelich (Chair), Christopher L. Fastie, Cliff R. Hupp, Robert G. Knox, James R. Runkle, Rebecca R. Sharitz, Sara L. Webb