[redacted]

only 0.33% of the time at -30 cm when snow was present, but 61% of the time when snow was absent.

INTRODUCTION

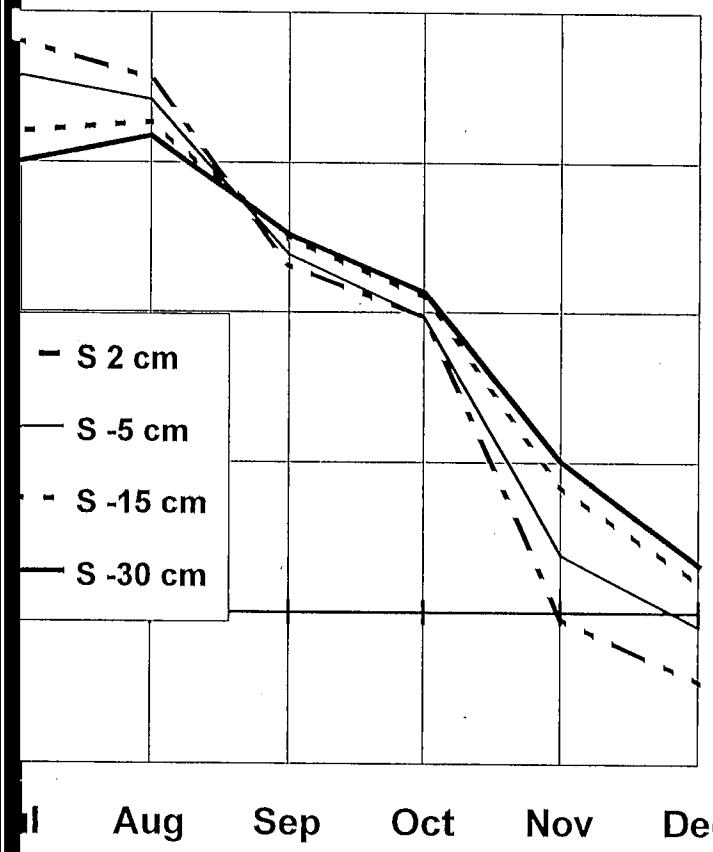
In January 1993 a study was initiated to continuously monitor [redacted]

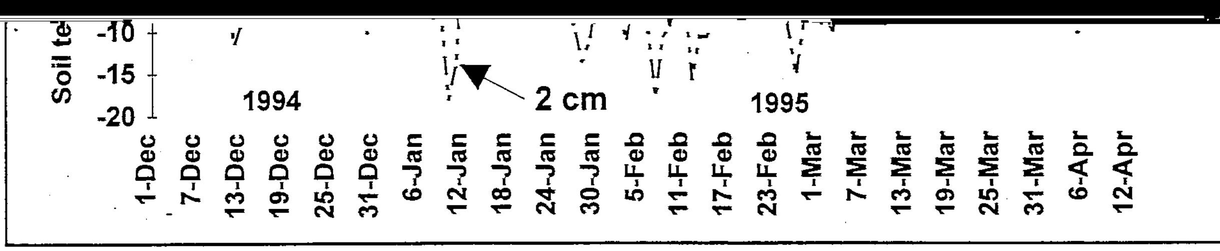
C; reaching 5.5° C during the January thaw) until early March when temperatures dipped slightly below freezing (reaching -0.1° C). In snow-free plots at -15 cm, soil temperatures approached freezing in mid January, just prior to the January thaw, rose to

e and 5, 15, and 30 cm below the soil surface in a
enter in Underhill, VT.

emperatures

ot

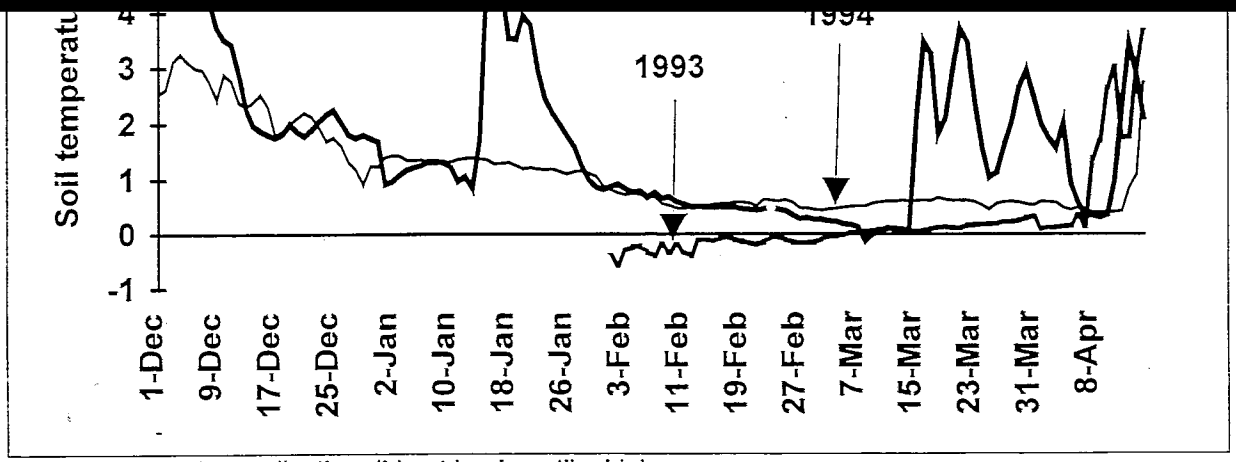




-10
-15
-20
1994
2 cm
1995
1-Dec
7-Dec
13-Dec
19-Dec
25-Dec
31-Dec
6-Jan
12-Jan
18-Jan
24-Jan
30-Jan
5-Feb
11-Feb
17-Feb
23-Feb
1-Mar
7-Mar
13-Mar
19-Mar
25-Mar
31-Mar
6-Apr
12-Apr


Ambient temperature (°C)

1-Dec
7-Dec
3-Dec
9-Dec
5-Dec
1-Dec
6-Jan
2-Jan
8-Jan
4-Jan
0-Jan
5-Feb
1-Feb
7-Feb
3-Feb
1-Mar
7-Mar
3-Mar
9-Mar
5-Mar
1-Mar
6-Apr
2-Apr



Note: In 1993 data collection did not begin until mid January.

[redacted]

[redacted]

When averaged over all three years, below freezing temperatures occurred only 0.33% of the time at -30 cm when snow cover was present, but 61% of the time when snow was absent.

DISCUSSION

Soil temperature is an important factor affecting establishment, growth and productivity, and survival of forest trees. In winter, soil temperature influences the degree of cold hardiness in roots of woody plants, regulates the supply of available moisture, and affects insect populations (i.e., pear thrips) and other soil-dwelling organisms. Winter desiccation, a particular problem in some conifer species, results when plants are deprived of moisture due to frozen soils and possibly frozen roots at the same time water is being lost through transpiration. In winter, length and frequency of soil freeze-thaw cycles, as well as depth of freezing, influence the severity of physiological and physical perturbation to trees and other biota. Extremes in high as well as low soil temperatures

temperatures available, so these data provide valuable information about this fundamental property of soils and its important effects on plant roots and soil biota.

FUTURE PLANS

We plan to continue the experiment over several winters in an attempt to characterize soil temperature patterns under a variety of winter climatic conditions.

FUNDING SOURCES

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