

Frost Heaving Encyclopedia Article

Frost Heaving

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The lifting of earth by **soil** water as it freezes. Freezing water expands by approximately nine percent and exerts a pressure of about fifteen tons per square inch. Although this pressure and accompanying expansion are exerted equally in all directions, movement takes place in the direction of least **resistance**, namely upward. As a result, buried rocks, varying from pebbles to boulders, can be raised to the ground surface; small mounds and layers of soil can be heaved up; young plants can be ripped from the earth or torn apart below ground; and pavement and foundations can be cracked and lifted. Newly planted tree seedlings, grass, and agricultural crops are particularly vulnerable to being lifted by acicular ice crystals during early fall and late spring frosts. Extreme cases in cold climates at high latitudes or high elevation at mid-latitudes result in characteristic patterned ground.