Background
Treelines are very conspicuous natural vegetation boundaries, and the causes and dynamics of treeline formation are among the most long-standing research topics in ecology. Treelines are under tight climatic controls, but they are also subject to intense human land use. Treelines are thus responsive to global change, and interest in treeline research has intensified in recent years. We study cold "alpine" treelines in high-elevation environments of European mountains, in the Andes, on oceanic islands and in the equatorial mountains of East Africa. Other projects focus on the dry "steppe treelines" of northern Mongolia and southern Patagonia, were forests border to semi-arid steppe vegetation.

Research

Key results
- Alpine Treelines: Climatic measurements suggest temperature and moisture constraints to tree growth. In contrast to current theories about carbon allocation problems, trees at all studied treelines invest heavily in their fine root systems which are much more extensive than in stands at lower altitudes.
- Dry Treelines: Drought stress and herbivory by insects and small mammals prevent the trees in the Mongolian forest-steppe ecotone from encroaching onto grasslands. Late 20th century warming far above the global average reduces growth and regeneration in Mongolia's main tree species, Larix sibirica, but there is pronounced regional variation.

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