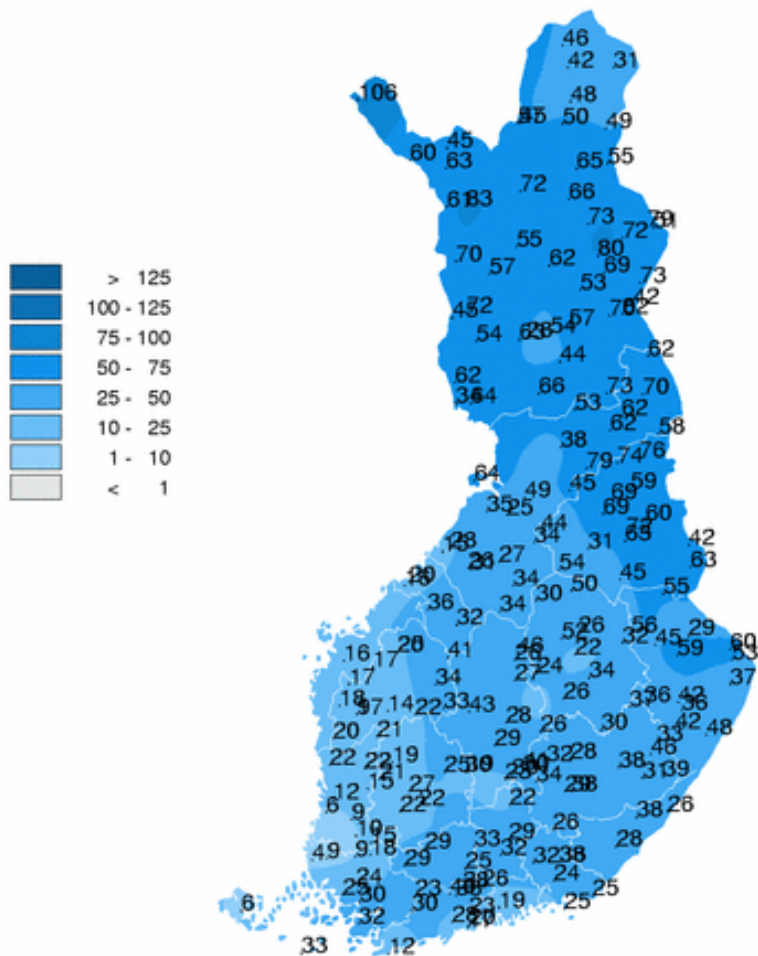
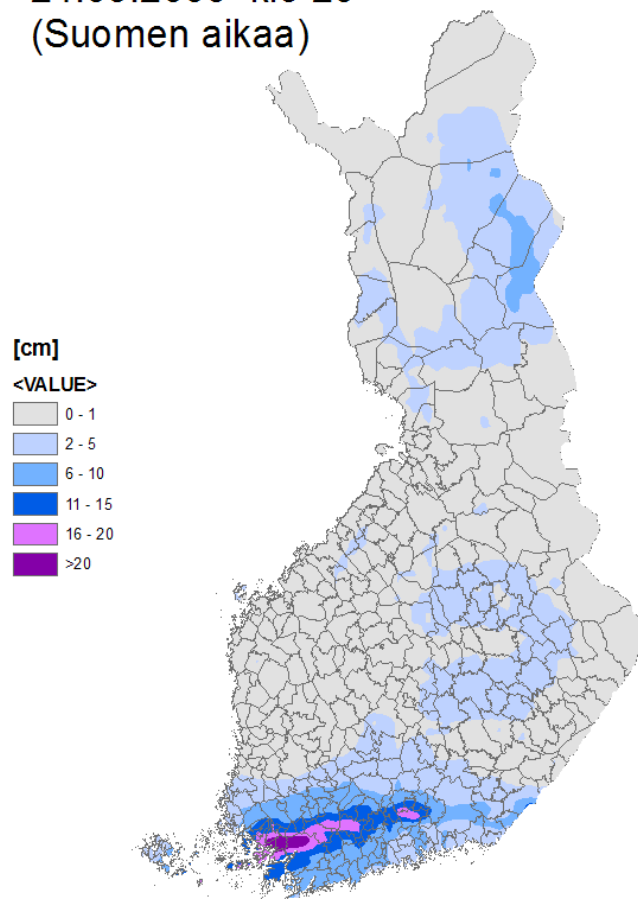


Lumen syvyys (cm) 25.03.2009



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Tutkadatan avulla arvioitu lumena tulleen sateen määrä [cm] 23.03.2009 klo 14 - 24.03.2009 klo 20 (Suomen aikaa)



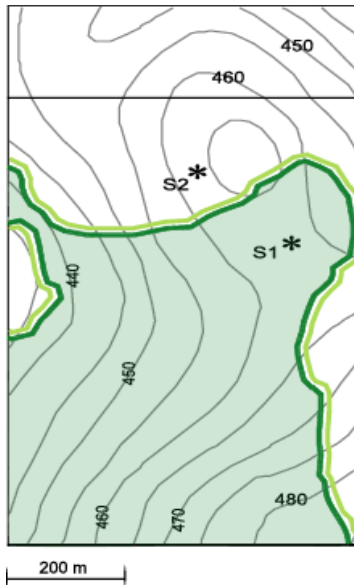
Field measurements

✓ Snow depth and density measurements over forest and tundra vegetation (1*0.6 km) in March 2003

✓ Observations with two automatic weather stations between September 2003-June 2006:
- air temperature, pressure, relative humidity, global radiation, precipitation, wind speed and direction, soil temperature (0.1 m, 0.3 m and 0.5 m) and soil moisture (0.1 m)



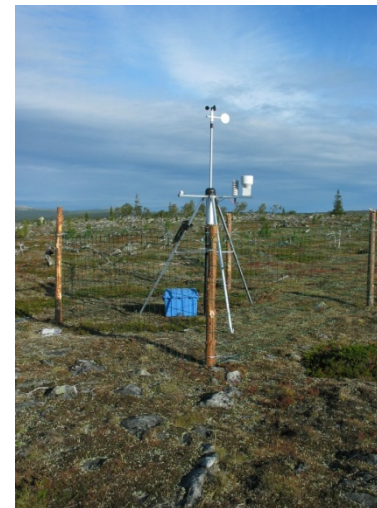
— the borderline of treeless, tundra vegetation
— the borderline of the forest vegetation
— contour lines (m, a.s.l.)
S1, S2 the location of the weather stations



Model runs

✓ Spatial variation (10 m resolution) of wind speed and direction (WAsP Model, 1989)

✓ Annual and seasonal post-fire heat and water fluxes in the soil-vegetation-atmosphere system using CoupModel (Coupled heat and mass transfer model for soil-plant-atmosphere systems, 2001)



Snow cover

- depends mainly on vegetation type ($r=0.87$) and wind velocity ($r=0.66$)
- spatial distribution of snow depth based on measurements:
 - tundra covered site 40-70 cm (mean 61.1 cm)
 - forest 70-120 cm (mean 89.9 cm)
- water equivalent: open site 1230 mm
forest 2257 mm
- modelled snow cover: delayed melt in forest, 6-12 days

Effects of snow cover on vegetation

- (+) → protection from frost, desiccation, wind abrasion, reindeer grazing
 - increase in melt water runoff and soil moisture
 - enhances nutrient release
- (-) → shorter growing season
 - mechanical damage caused by heavy snow load, rime and hoar frost
 - snow fungus development

10 m resolution

