# Impacts of soil drought on transpiration in a tropical evergreen forest in northern Thailand

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## . Introduction

Tropical seasonal forests in Southeast Asia have considerable impacts on global and regional water cycling (Kanae et al. 2001. J Hydromet: Mabuchi et al. 2005. J Clim).

Drying trends have been pointed out in this region resulting from marginal decrease in rainfall and greater frequency of ENSO (Malhi & Wright 2004, Phil Trans R Soc Lond B).

To clarify a possible impact on ecohydrological processes of severe drought in tropical seasonal forests,

1. Sap flow and water potential measurements was conducted in larger and smaller sized trees in a hill evergreen forest in two years with long-term meteorological and soil moisture measurements .

2. Size-related impacts of soil drought resulting from inter-annual variations in rainfall on transpiration were examined.

## 2. Materials & Methods

Materials: Cinnamomum porrectum (CL:30, and CS:1.5 m) Lithocarpus elegans (LL:25, and LS:5 m) in a hill every elegans forest near ChiangMai City in Thailand under monsoonal influences.



Measurements:

Leaf and stem water potential measurements (Pleaf, Pstem) by pressure chamber were conducted in the rainy, the early and the late dry seasons in 2003, 2004, total five times.

Sap flow measurements by heat-pulse method or stem heat balance method were conducted simultaneously.

Meteorological and soil moisture measurements were also conducted. In addition, we performed partial irrigation!

### Meteorological elements in this site



·Long-term meteorological measurements showed that large interannual variations in rainfall and the length of dry period.

# 3. Results





 Sap flow measurements revealed that the hill evergreen forest trees transpired actively even in the late dry season

· Significant decreased #stem in CS in the period suggests that CS suffered from soil drought significantly in severer dry season.

## 4. Discussion & Conclusions



### 2. Recovery of water status in CS after irrigation



Recovery of sap flow and water status in CS after irrigation confirmed that the reductions in sap flows and wleaf & stem were caused by soil drought.

#### 3. Size-related impacts of soil drought



Intensive Selective cutting in this forest

