

Pichit Lumyai 2009: Climatic Effects on Growth of *Pinus merkusii* Jungh. & de Vriese in Phutoei National Park, Suphan Buri Province. Master of Science (Forest Resource Management), Major Field: Forest Resource Management, Department of Forest Management. Thesis Advisor: Assistant Professor Khwanchai Duangsathaporn, Ph.D. 95 pages.

The study was designed to investigate the relationship between tree-growth and climatic data in *Pinus merkusii* by using dendrochronological techniques. Furthermore, this study also examined the challenges for climatic reconstruction. The climatic factors included average monthly and yearly temperature, total monthly and yearly rainfall and average monthly and yearly relative humidity data. A samples of 48 cores from 24 trees were collected from Phutoei National Park in Suphan Buri Province.

The growth models of each sample cores indicating the relationship between tree ring width and years included S-Curve equation 78% , Exponential equation 20% and Linear equation 2% .The 230 years tree-ring chronology was built from 1779-2008 ,was correlated with 55 years climatic data that collected in the Suphan Buri Meteorological Station in 1953-2007. The chronology indicated a high correlation ($P < 0.01$) with the present and previous year average temperature and correlation with the current year temperature in October.

In addition, based on the correlation with the temperature, the steady chronology throughout the period of 1858-1992 could be referred to the stable temperature, while the above average growth index for 0.14 and 0.625 in the prior period (1779-1826) and the later period (1993 to present time) were explained to the higher temperature than the average growth index. Finally Tree-ring Index reveal power from increasing temperature at the multi-decadal scale at 44-52 years.

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Thesis Advisor's signature

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