

Forest History in Japan under changing environment

Kyoto-“Kitayama” Sugi



(*Cryptomeria japonica*)

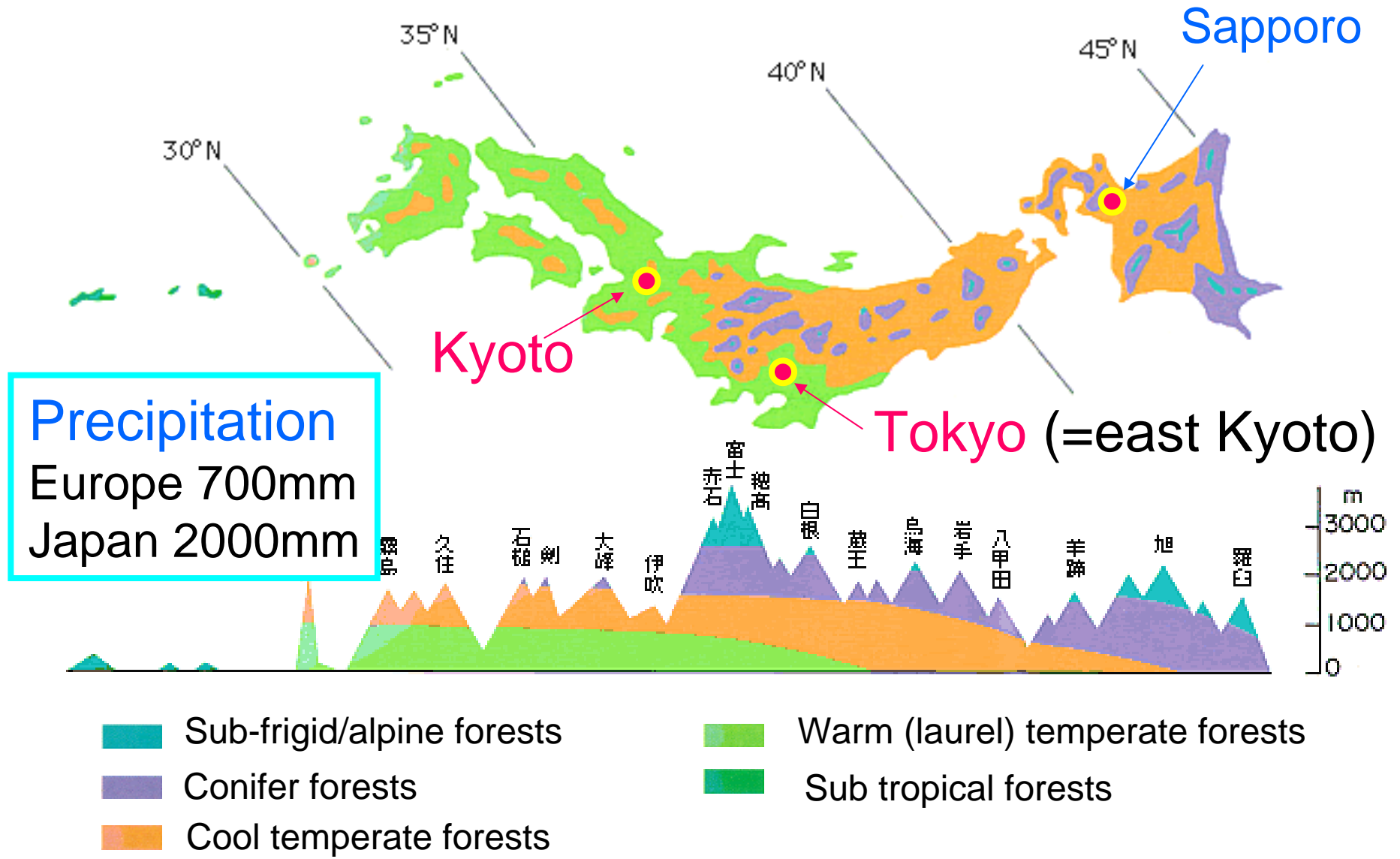
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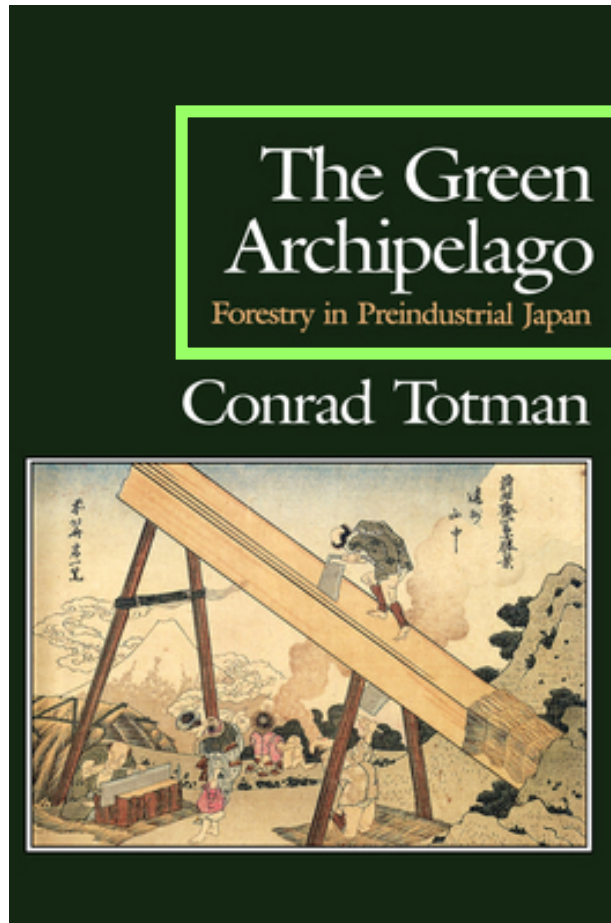
Vertical and horizontal distribution of Japanese forests



Based on the history of Japanese forestry shown in



Professor
Minoru Kumazaki
(The Univ of Tsukuba
Japan)



The illustration shows the activities of carpentry



Professor
Conrad Totman
(Yale University
U.S.A.)

Environment
change
(O₃, N stress)

Current forestry
around 2000

Globalization
X

Ancient
predation
600-850

Forest history In Japan

After W.W.II
We planted
Intensively trees
1945-1955

Exploitation
Forestry
around 1000

Regulation by
preservation
X

Plantation
forestry
with intensive
tending started
at around 1800

Early modern
predation
around 1600



Intensive tending for producing high quality woods in Kyoto

Original vegetation of Hokkaido, mixed forest



Japanese larch plantation



Typhoon attacked in 1954, 2004



After W.W.II, we had transplanted from secondary broad-leaved to confers;

e.g. the trace of man-made larch forests are the shape of Hokkaido.

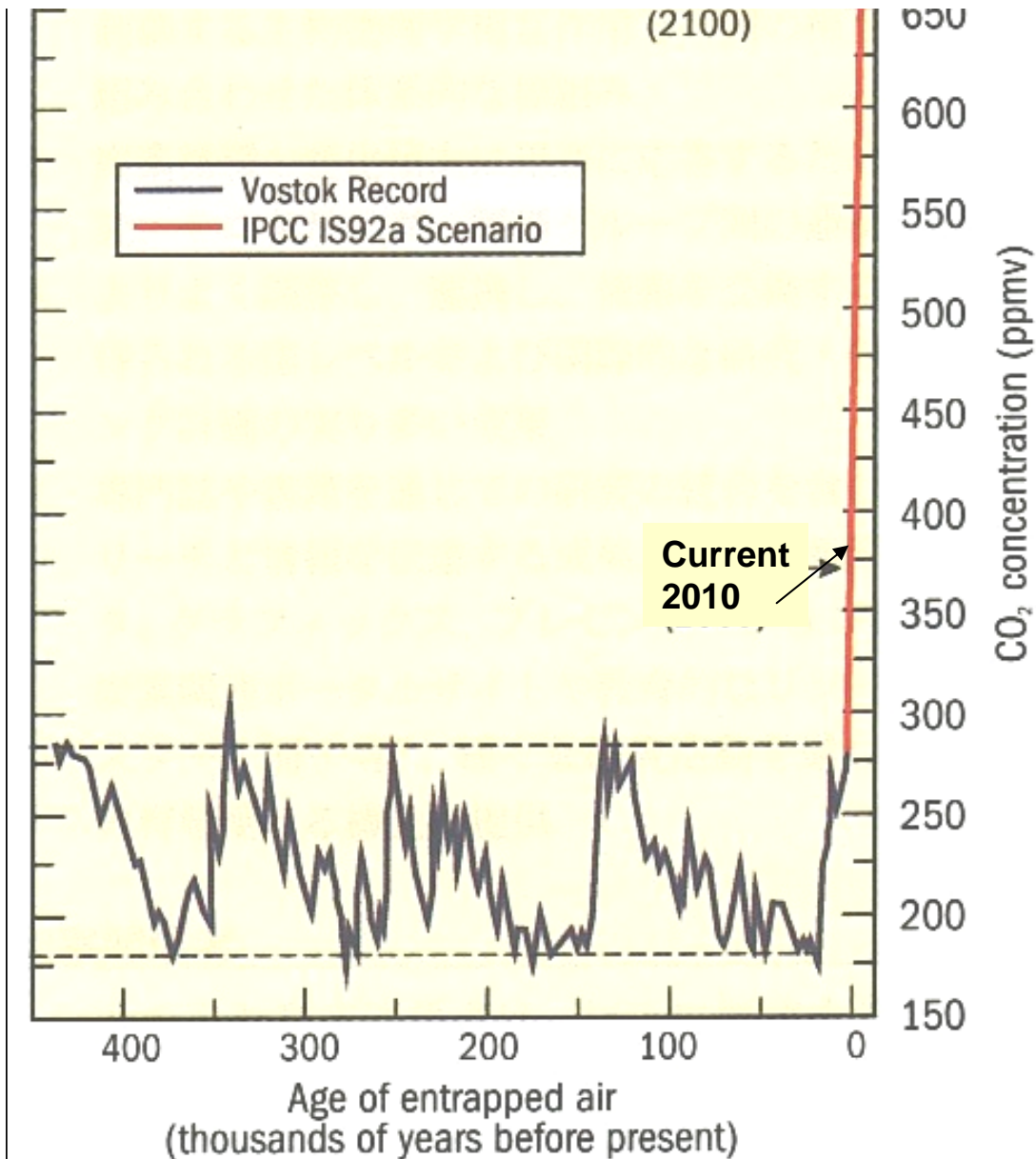
- After severe typhoon damages, we simulate to make a forest to the original type mixed forest.



Current situation:

no tending was carried out due to the globalization.

- Plantation forestry faces now severe difficulties.



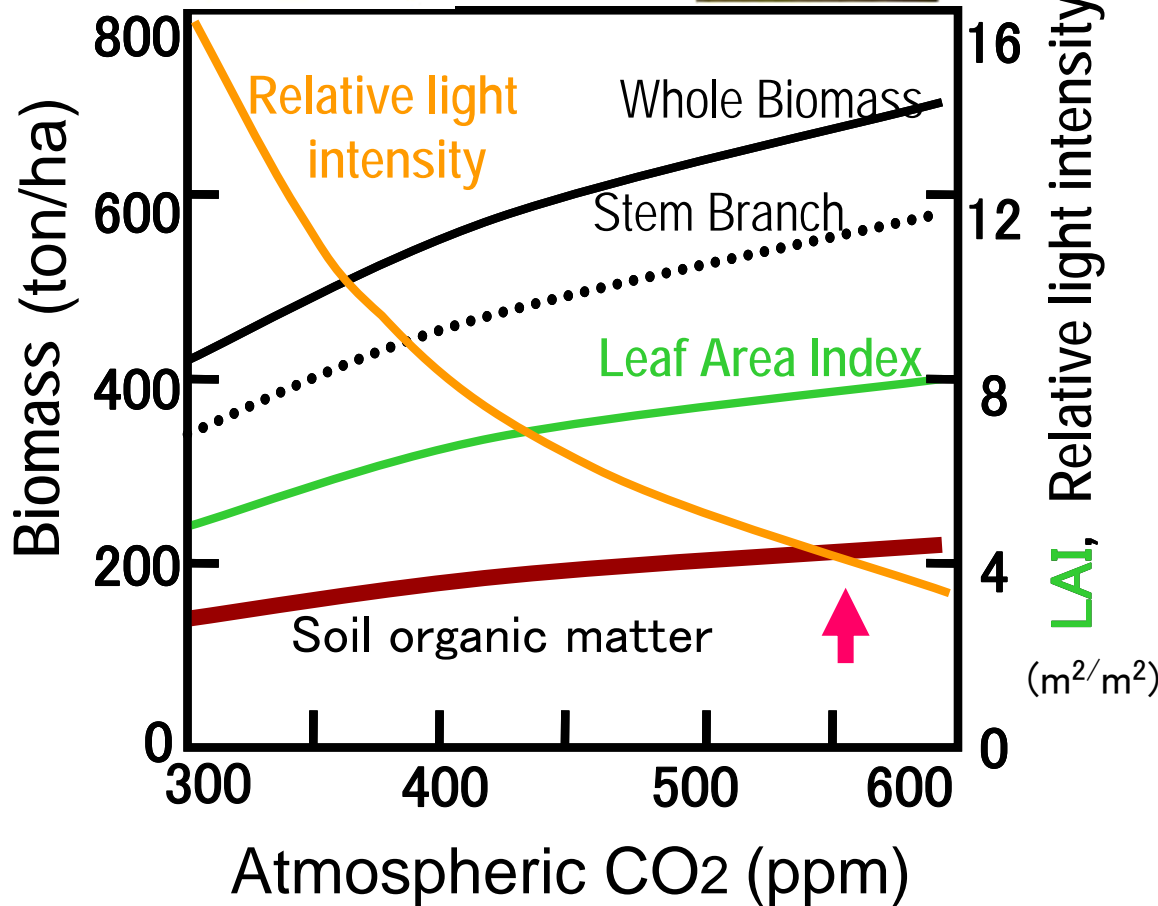
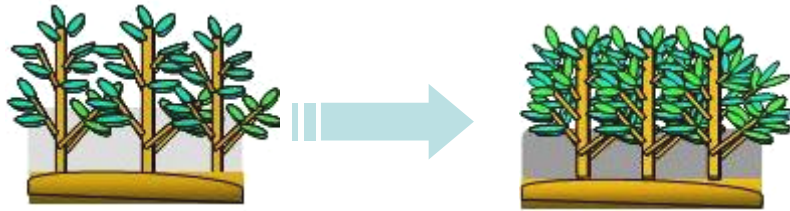
Moreover,

We should make new forestry under changing environment, e.g. elevated CO₂, ozone, and high nitrogen deposition.

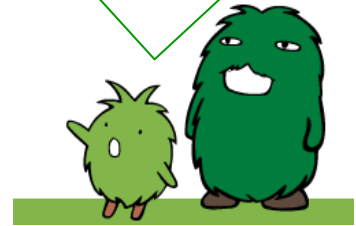
What can we do for overcoming these difficulties?

High CO₂ affecting the structure of a forest (Biodiversity)

Shoot development of upper layer will be increased by elevated CO₂



Will regenerated seedlings in a forest floor be able to survive?



Symbol of EXPO

Critical relative light Intensity is about **5%**

(Oikawa 1986; Bot. Mag. Tokyo 99: 419-)

Conclusion

- 1) Ancient predation: forests recovered naturally soon.
- 2) Exploitation Forestry: people had started the over-use of forest resources and consequently the surrounding mountains became naked in Kyoto.
- 3) Early modern predation: *Hideyoshi Toyotomi* was the first person who could manage woods in whole Japan; following *Tokugawa-shugun* to build castles, temples, shrines to show power.
- 4) To keep forest resources, plantation forestry with intensive tending saved forests with green at 1800.
- 5) Under globalization, most man-made forests have been discarded without tending