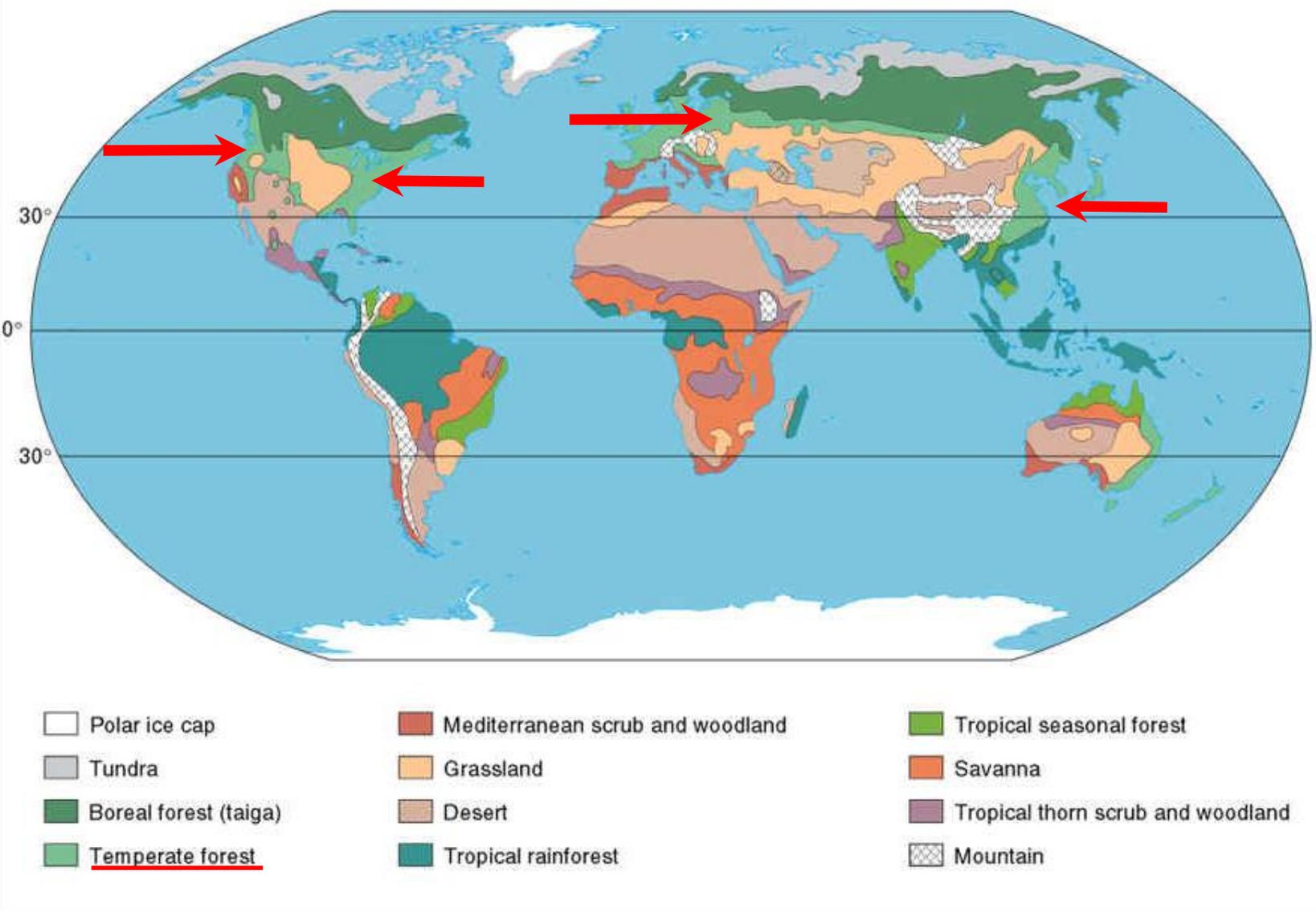


Lecture 4

Forests of the world (II)

The Worlds Major Forest Biomes

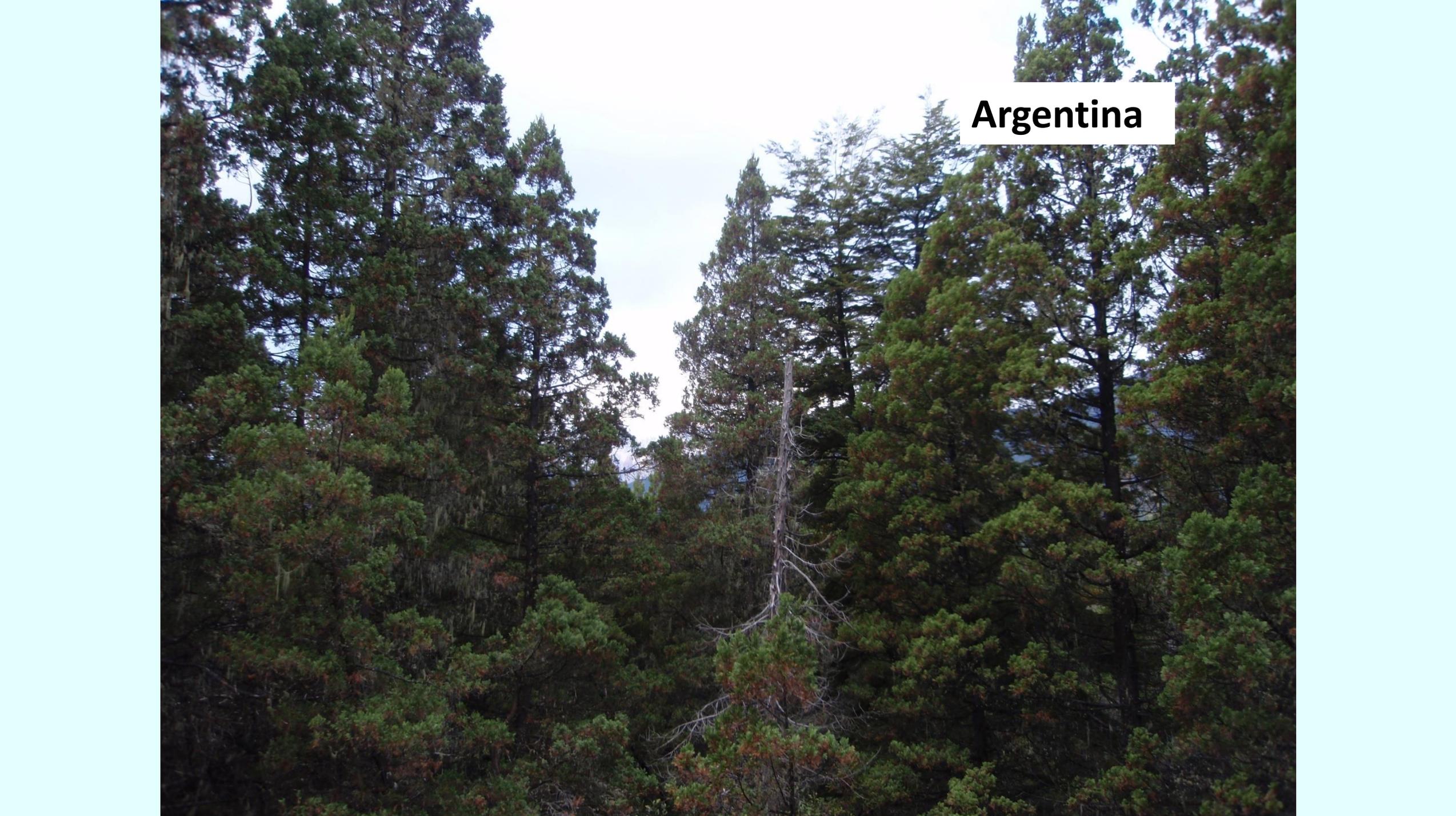


Near Vancouver



Temperate Forest Biome

- **These forests mainly occupy the temperate latitudes of the northern hemisphere. They comprise a broad band around the globe south of the boreal.**
- **Three major regions are western and central Europe, east Asia and eastern N. America.**
- **ALSO a smaller area in western N. America (including BC)**
- **There is small representation in the southern hemisphere – S. Chile and Argentina for example.**



Argentina

Temperate Forest Biome

- **Precipitation is higher than the boreal (700-1500mm)**
The growing season is longer than in the boreal (200 days or more)

The Temperate Forest Biome

- The dominant plant species are broadleaved deciduous trees but species composition varies from pure hardwoods through mixed forests to pure conifer.
- Where coniferous components exist they can be very valuable commercially (for example coastal BC and the US Pacific Northwest and the eastern white pine (*Pinus strobus*) associations of eastern Canada and the United States.

Pinus strobus



Temperate Forest Biome

- **Forests are more complex than boreal forests in terms of species composition and structure - uneven aged in many cases with multiple canopy and vegetation layers.**
- **Nutrient cycling is more rapid than in the boreal and more nutrients are stored in biomass.**
- **Why?**
 - warmer

Temperate Forest Biome

- Forests are more complex than boreal forests in terms of species composition and structure - uneven aged in many cases with multiple canopy and vegetation layers.
- Nutrient cycling is more rapid than in the boreal and more nutrients are stored in biomass.
- European forests are less species diverse than their N.American counterparts
 - Species include a broad spectrum of temperate hardwoods: oaks (*Quercus* spp.); elm (*Ulmus* spp.); ash (*Fraxinus* species); beech (*Fagus* spp.) lime or basswood (*Tilia* species), maples (*Acer* spp.)

Temperate Forest Biome

- **Commercial productivity is higher than the boreal averaging 4-5m³/ha/annum but has been increased considerably in many areas through forest management.**
- **This is the area occupied by the world's industrialized nations. In Asia and Europe most of the forest has been cleared for agriculture and urban infrastructure.**
- **In all areas there is a long history of exploitation for commercial timber.**

Temperate Forest Biome

There is virtually no primary forests remaining in the temperate mixed forest zone.

- China's forests have been cleared for intensive agriculture for over 4000 years.**
- Europe's forests have 2000 year history of exploitation are confined to relatively small areas of secondary forest.**
- Japan's forests are largely second-growth or plantations. In the mountains of Korea some intact forests remain.**

Temperate Forest Biome

- **This is the zone in which the practice of forest management developed and where forestry as a profession had its roots.**
- **In the industrialized countries of the zone the consumption of industrial forest products is very high.**
- **Although in western Europe all forests are secondary and total areas are low, the forests are intensively managed and production of roundwood is high.**
- **Plantations, both exotic and indigenous, are of growing importance in the temperate mixed forest zone particularly in Europe.**



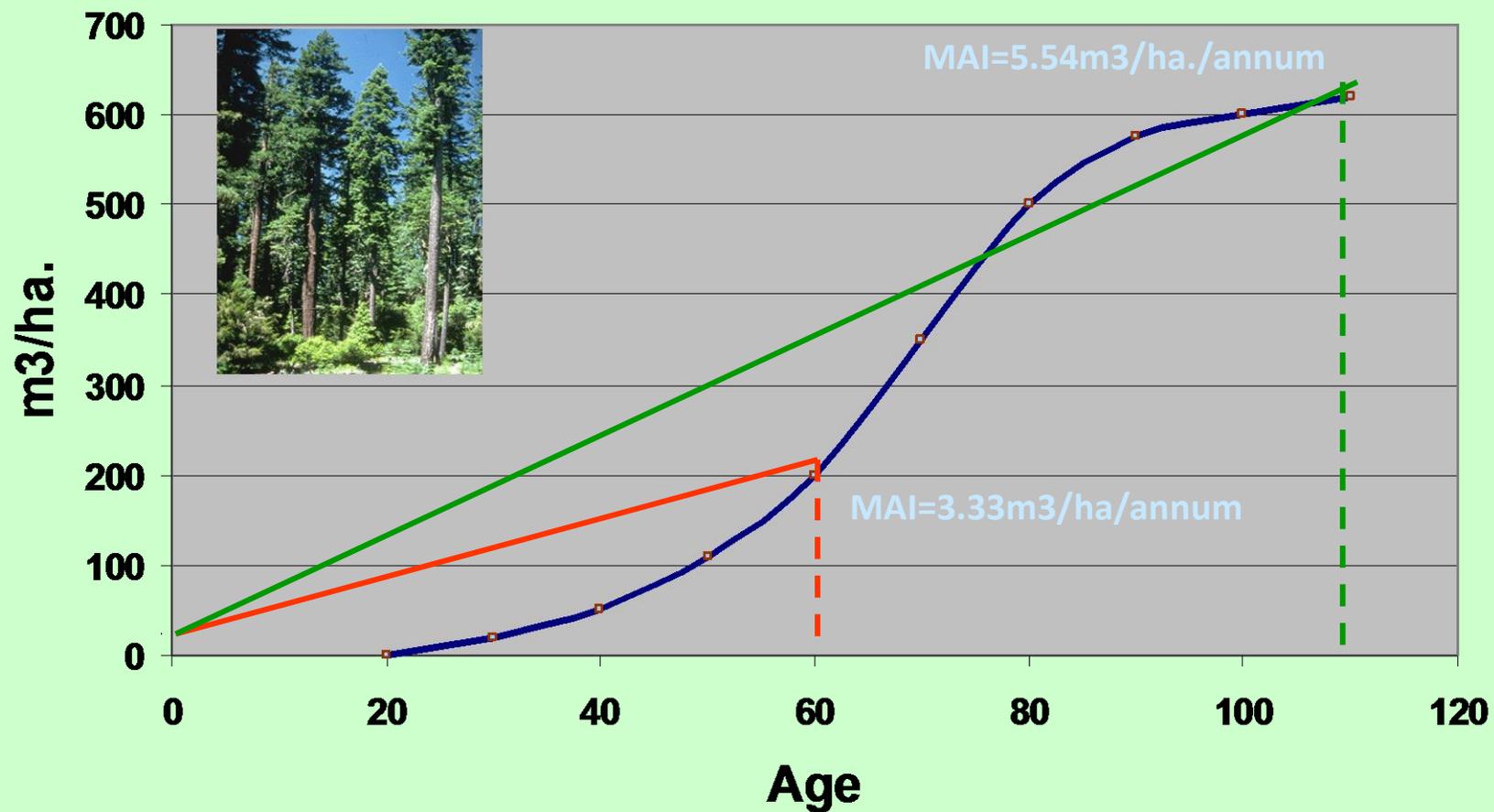
The Temperate Forests

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What is MAI?

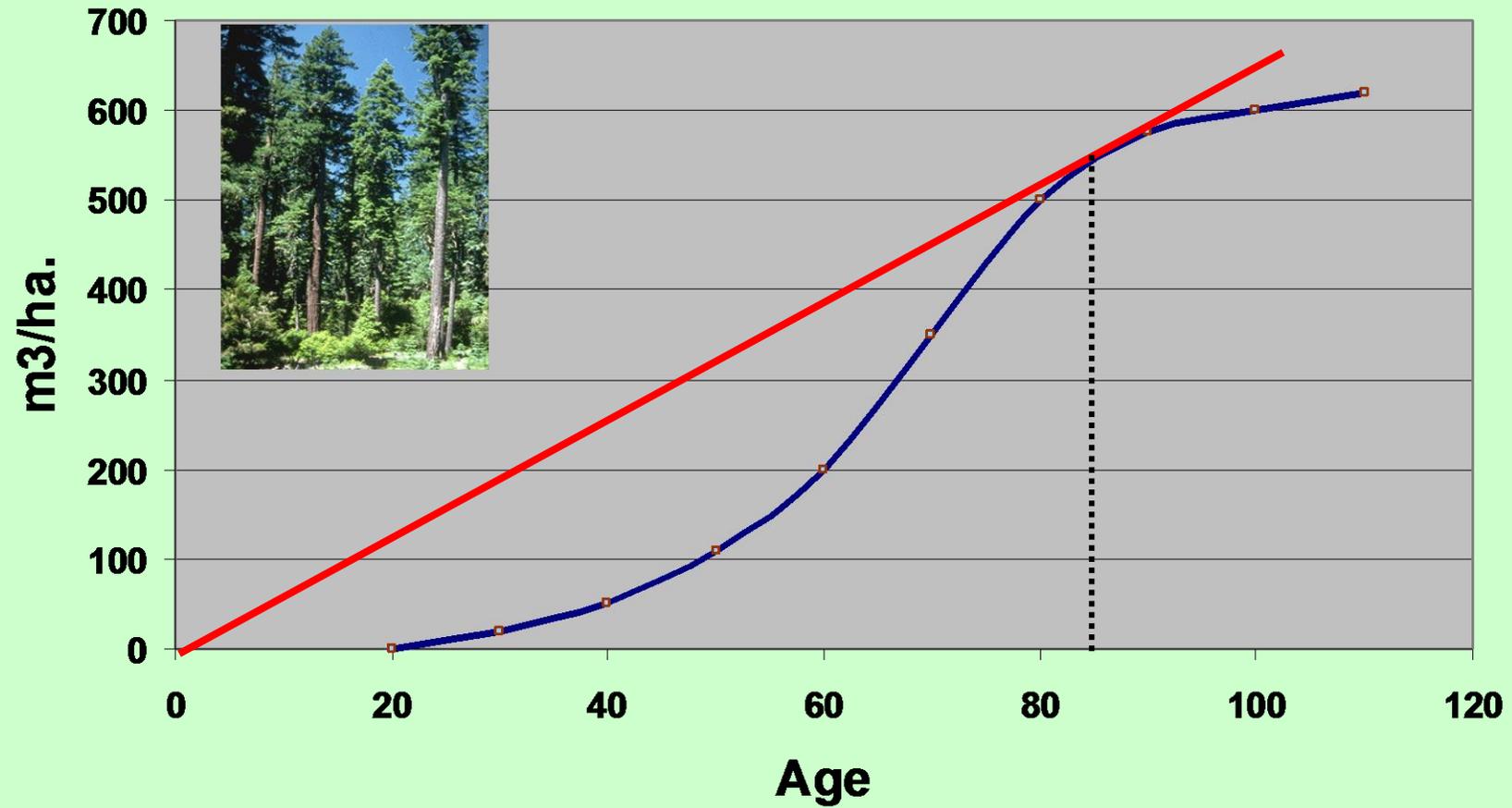
Mean Annual Increment

Measuring Mean Annual Increment (MAI)



Mean Annual Increment (MAI) = Volume/Age (m³/ha./annum)

Maximum Mean Annual Increment



Maximum MAI = $550/85 = 6.47 \text{ m}^3/\text{ha./annum}$

The Temperate Forests

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Ten Countries with the Largest Area of Productive Forest Plantations



Prepared by Philippe Rekacewicz assisted by Cecile Marin, Agnes Stienne, Guilio Frigieri, Riccardo Pravettoni, Laura Margueritte and Marion Lecoquierre.

The Temperate Forests

- **What are some of the advantages of growing exotic species?**
- **What are some of the disadvantages of growing exotic species?**

Concerns

- **Loss of biodiversity**
 - No consideration of wildlife habitat
 - Herbaceous understory killed
 - monoculture
- **Impact on water table**
 - Trees are very inefficient water uses
 - Genetic selection exacerbates this concern
 - salinization