

# **Future of European Forests:** ***Demands and Threats at the EU level***

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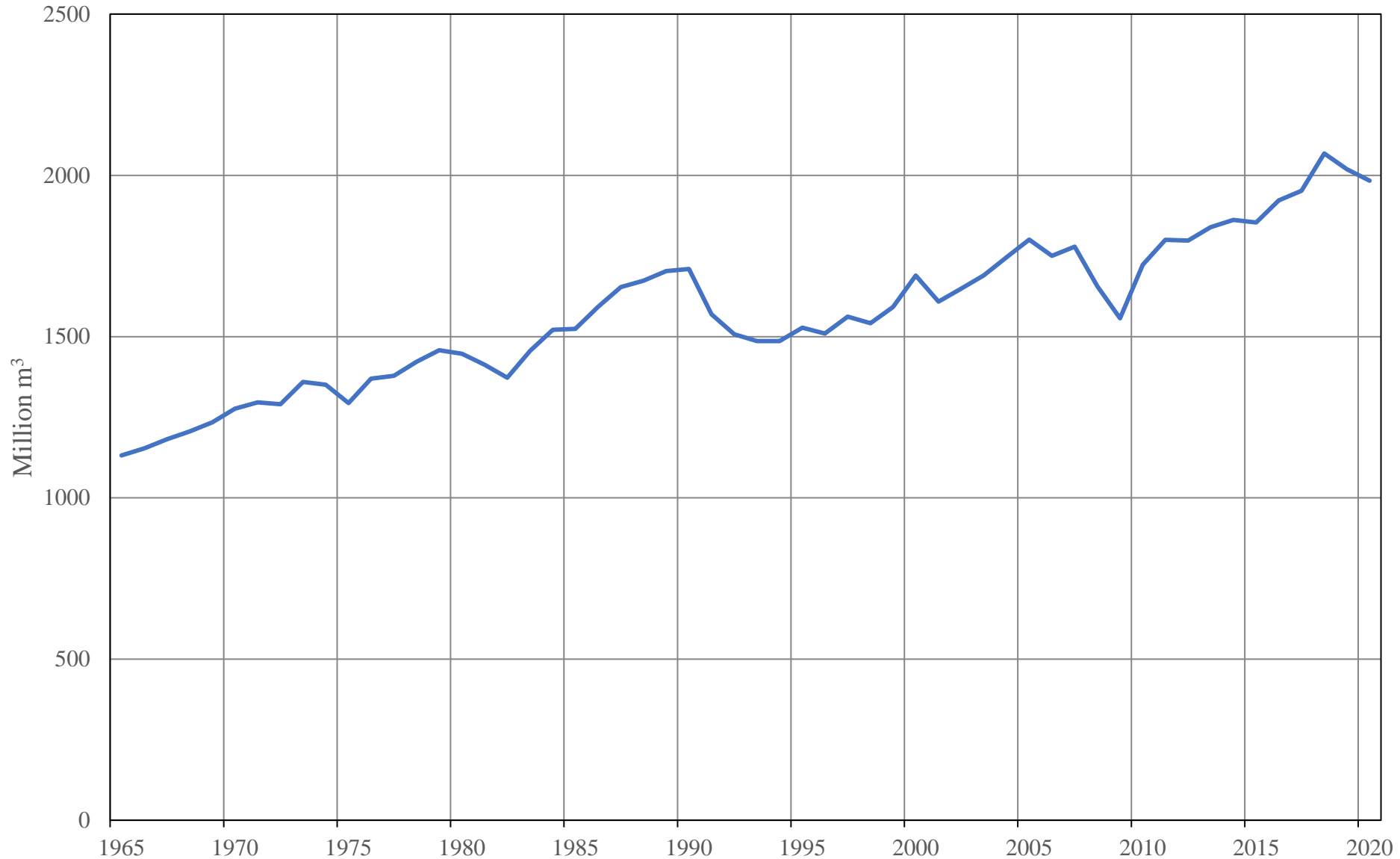


# Outline of Presentation

1. Demands on European forests
2. Potential response to these demands
3. Potential forest types to consider
4. Abiotic and biotic threats to forests
5. Balancing demands and threats

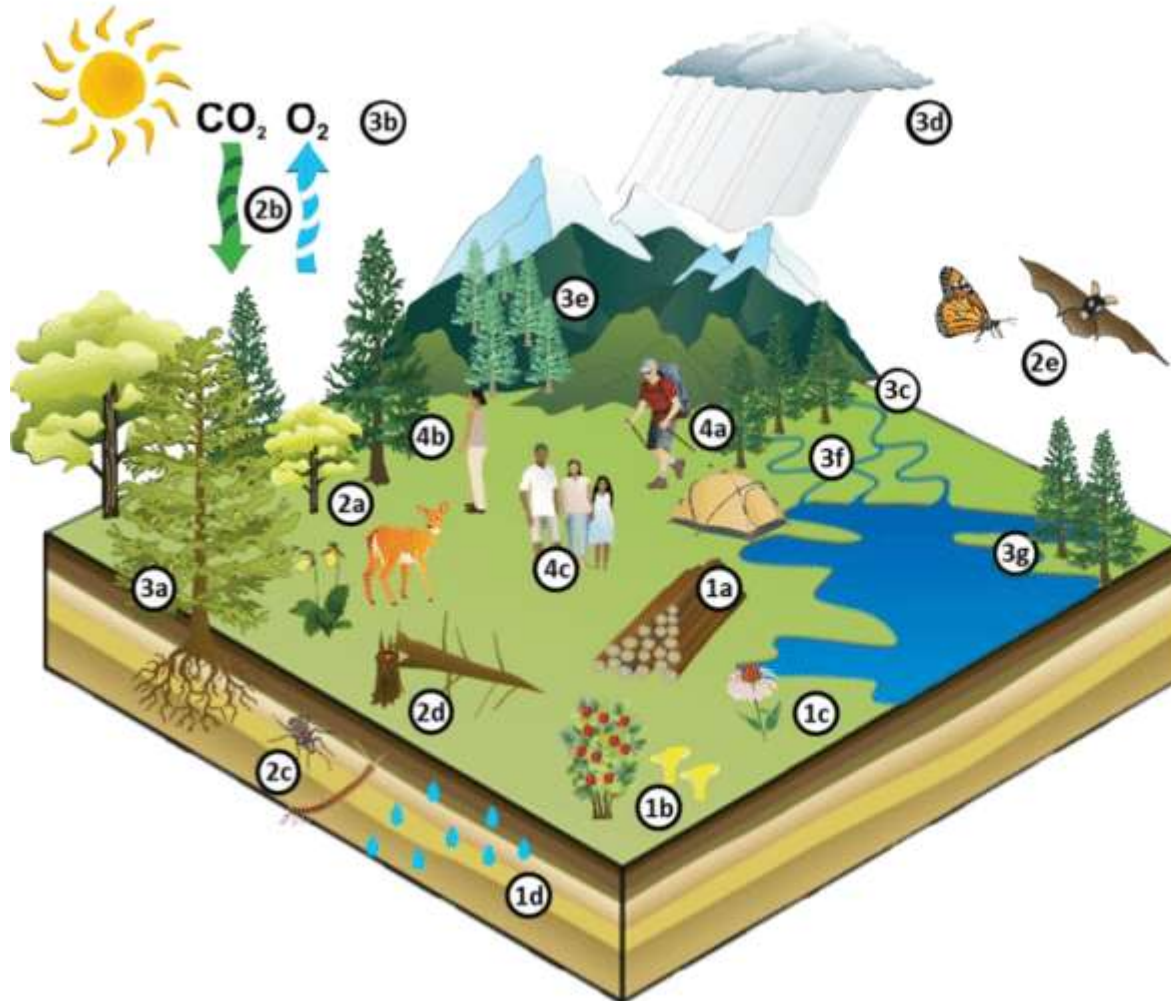
# Worldwide Wood Production and Consumption

World Industrial Roundwood Production



23<sup>rd</sup> June 2022

# Forest Ecosystem Services



## Ecosystem services of forests

### 1. Provisioning Services

- a. Timber/Fibre (construction, energy)
- b. Food (deer, fruits, herbs, seeds, honey)
- c. Chemical and medicinal products
- d. Water

### 2. Supporting Services

- a. Habitats for fauna and flora (biodiversity)
- b. Photosynthesis/Primary production
- c. Soil formation
- d. Nutrient cycling
- e. Pollination, seed dispersal

### 3. Regulating Services

- a. Carbon storage (above/below ground)
- b. Purification of air
- c. Purification of water
- d. Climate regulation
- e. Protection against erosion/avalanches
- f. Flood mitigation
- g. Protection against coastal erosion and storms

### 4. Cultural Services

- a. Recreation/Aesthetics
- b. Spirituality
- c. Education

Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science ([ian.umces.edu/symbols/](http://ian.umces.edu/symbols/))

from: Holzwarth et al. Remote Sens. 2020.



# The Future: Possible Approaches

There are different approaches when resources are becoming scarce (Pretty 1997):

1. **Business as Usual Optimism:** The market will provide by increasing productive area and a slowing down of demand as the world's population begins to stabilise.
2. **Environmental Pessimism:** The ecological limits to growth have been reached and we will be unable to sustainably supply the increasing and changing demand.
3. **Industrialised World to the Rescue:** The developing world cannot manage, and the modernised processes of the industrialised world will provide what is needed and help protect the natural environment in the developing world. Production will move to the industrialised world leaving the developing world with forest reserves.
4. **New Modernism:** There will be intensification in the use of existing land with much more focus on a “science-based” approach. The system will be more sustainable because it will be focussed on a smaller area.
5. **Sustainable Intensification:** Integrated use of a range of methods and technologies to manage pests, nutrients, soil and water. There will be increasing emphasis on using natural processes to substitute for external inputs (e.g. fertilisers).



# The Future: Forest Management Alternatives





# Planted Forests: Potential Benefits

- Plant species/provenance/family/clone best suited to conditions, future climate, and markets
- Plant mixtures of desired species
- Benefit from breeding programmes (e.g. increased productivity, increased disease resistance, etc.)
- More organized forest that allows for easier access, thinning, harvesting, observation, etc.
- Faster rotations allow changes as conditions change
- Higher productivity (more from less land)

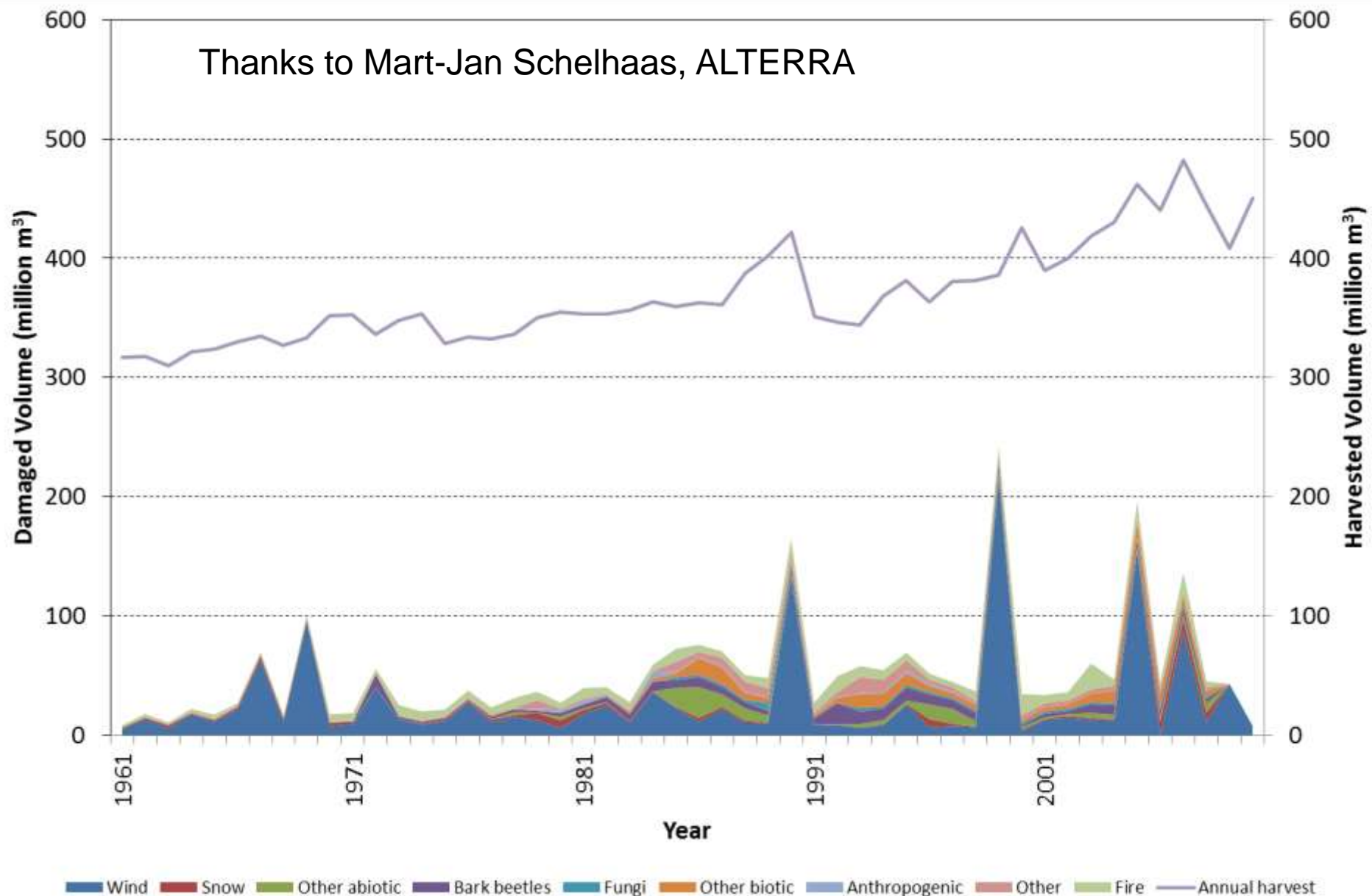
# Planted Forests: Potential Problems + Pitfalls

- Danger of focusing on a very few desirable species/provenances/families/clones
- Potentially difficult to switch to satisfy new market demands if too much focus on specific species
- Potential reduction in biodiversity value
- Care required during harvesting to protect soil and soil carbon
- Usually require high input (e.g. money, time, fertilisers, machinery, etc.)
- More at risk from pests specific to preferred species
- Probably less resilient than natural or managed natural forests

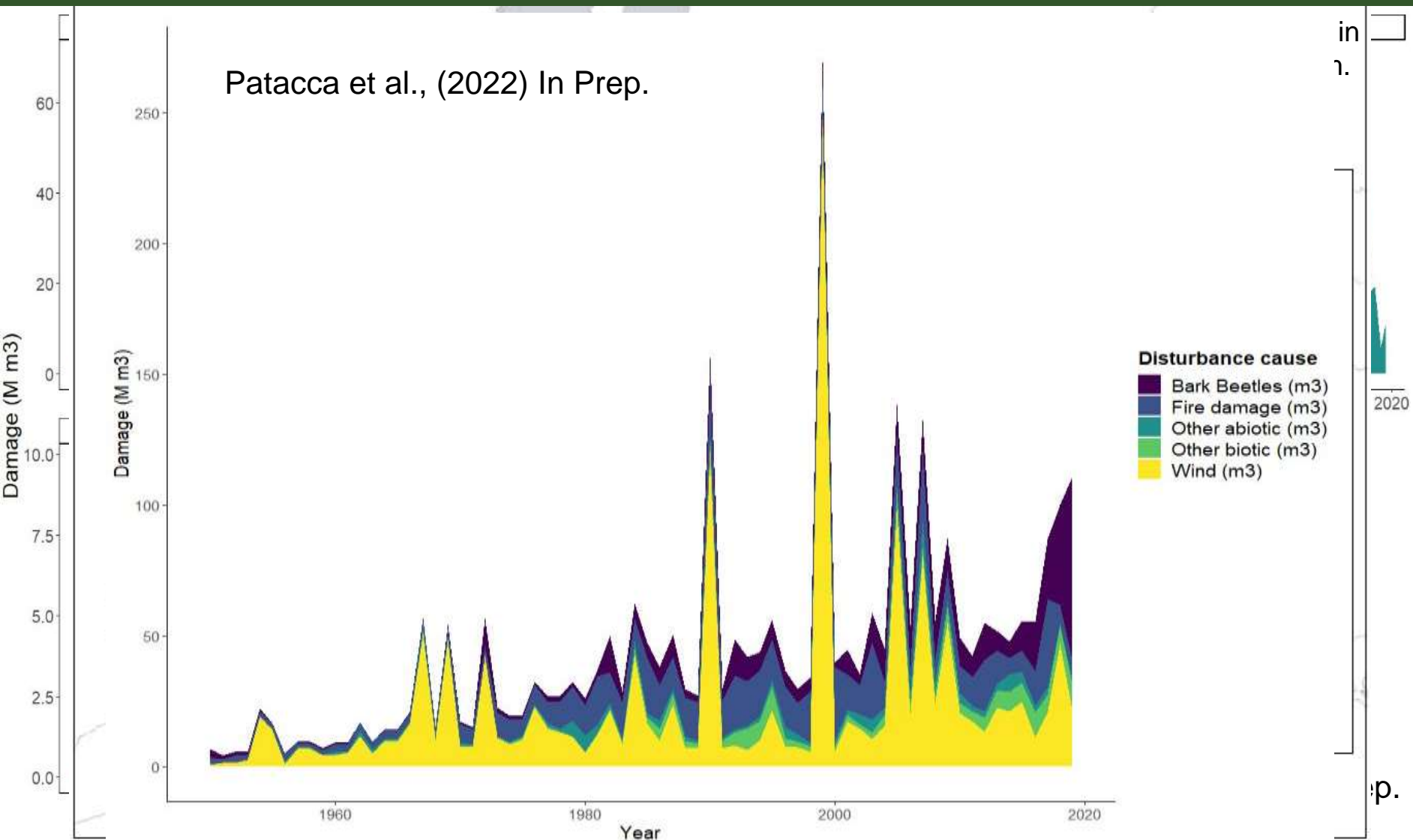


# Damage Trends in European Forests

Thanks to Mart-Jan Schelhaas, ALTERRA



# Damage Trends in European Forests





# Forest Damage: Drought/Bark Beetles





# Harz National Park 2018/19



IEFC Annual General Assembly  
23<sup>rd</sup> June 2022



# Forest Damage: Fires





# Forest Damage: Wind

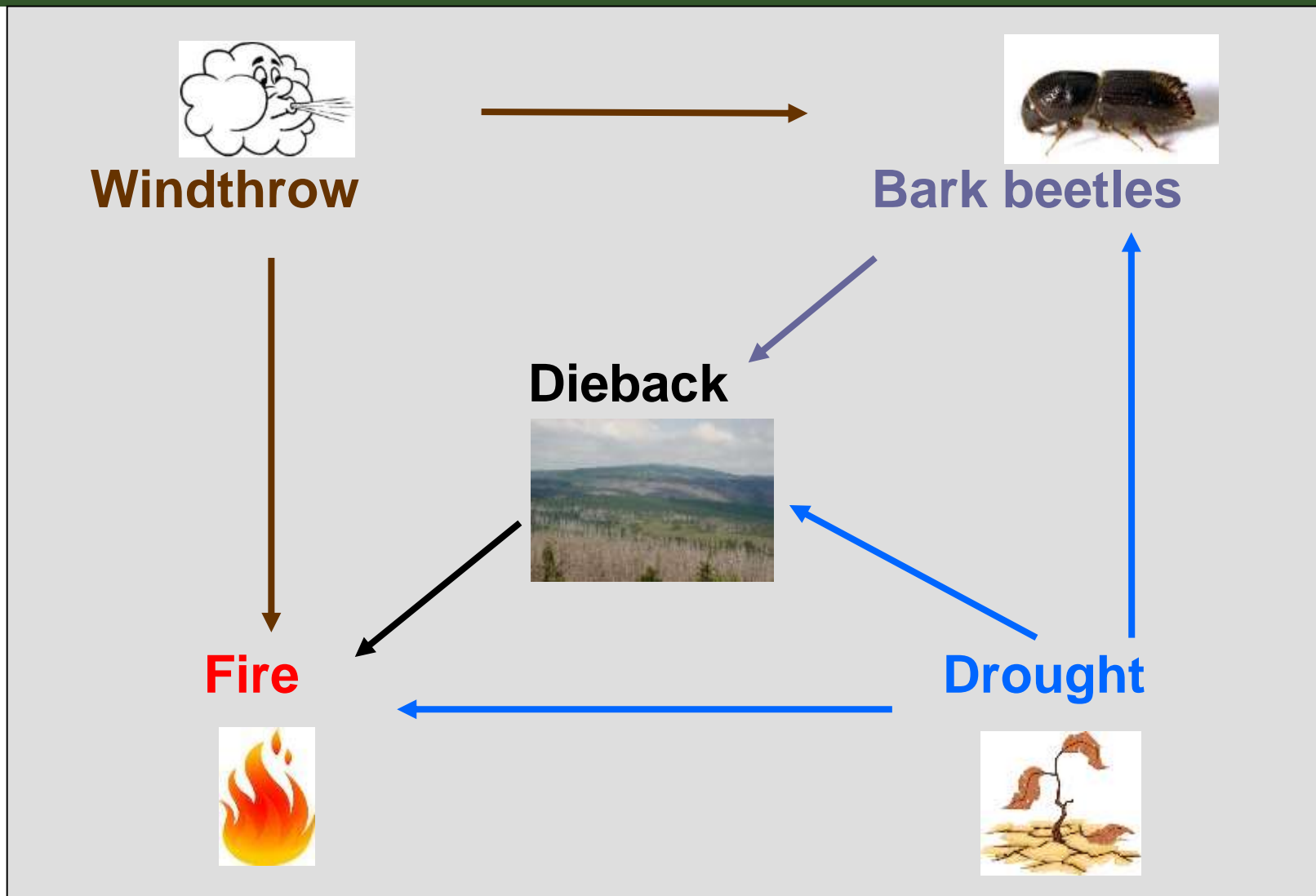




# Forest Damage: Pathogens



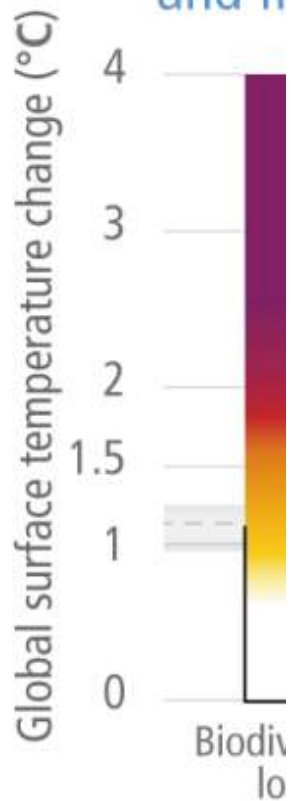
# Interactions between Hazards



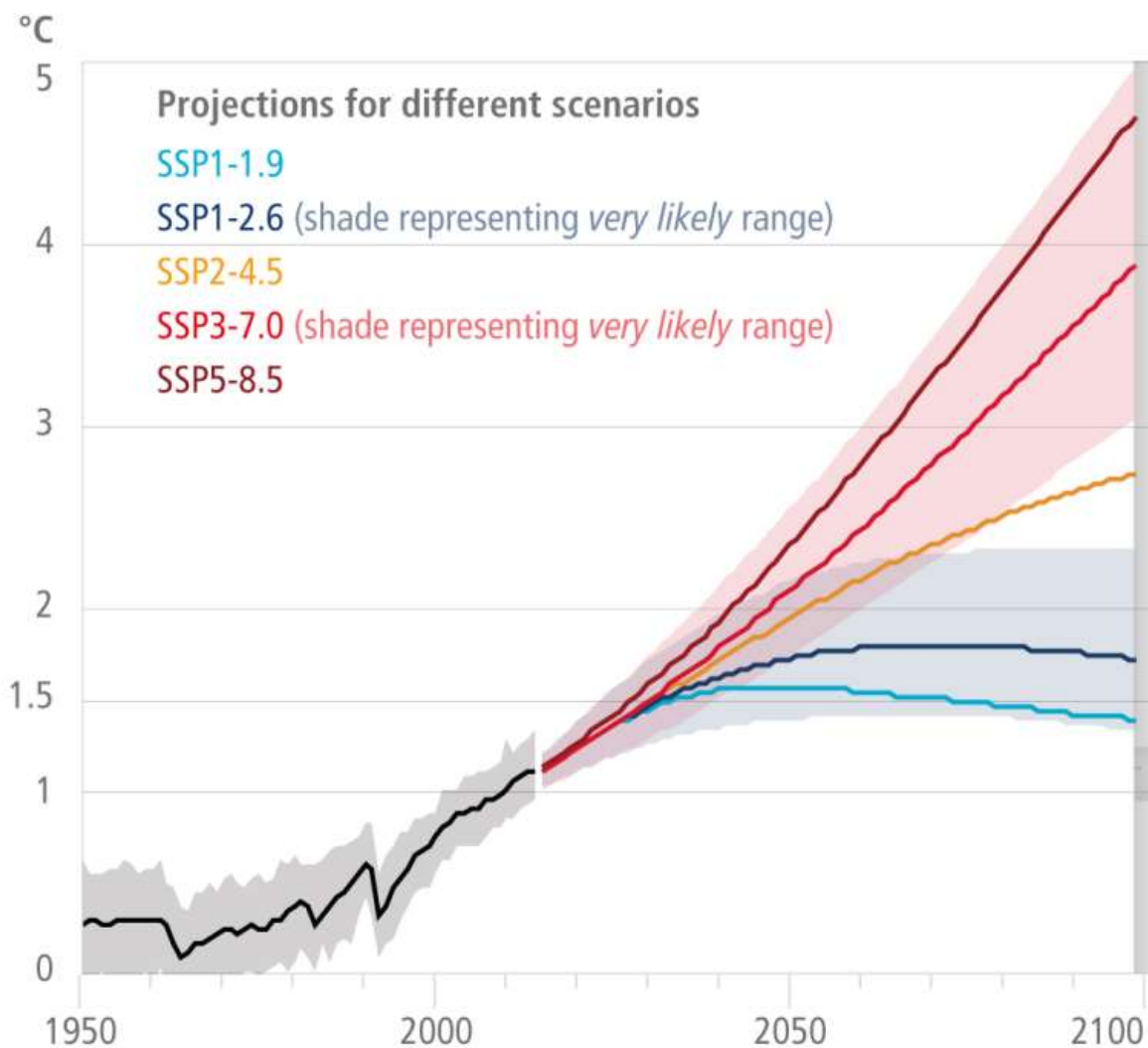


# Climate Change

(c) Impacts and feedbacks



(a) Global surface temperature change  
Increase relative to the period 1850–1900





# Climate Change: Wind



23 JUNE 2022



# Climate Change: Wind Damage + Multiple Hazards



# Summary: Demands and Issues

- Demands on forests for wood products and services continue to increase
- Increasing pressure on land-use from urbanisation and agriculture means the forest-based sector must make more targeted and efficient use of the land it has available
- Damage to forests everywhere is increasing alarmingly
- Damage types are changing in the changing climate
- Locations of damage are also changing
- There are strong interactions between different hazards



# Summary: Good News

- Planted forests offer a possibility to address some of the issues facing the forestry sector
- The knowledge and tools for implementing systems to increase the productivity of our forests and to make the best use of the material they produce are already available
- We have knowledge about risk to forests and tools to help assess and forecast that risk

# Summary: Requirements

- Silviculture needs to be dynamic and flexible to incorporate changes and to adapt to the problems of the future.
- Silvicultural systems need to be resilient and to incorporate risk mitigation strategies with the changing climate.
- Require a much greater level of integration of the forest-wood chain and proper exchange of information between all stages of the process (breeding, planting, tending, harvesting, processing, etc..).
- Require investment, co-operation of all stakeholders from growers to processors and researchers, and hard decisions on the management focus for every forest.



Natural Forest



Close to Nature



Mixed Forests



Intensive Even-aged



Short Rotation

IEFC Annual Ge  
23<sup>rd</sup> June 2022



A large pile of stacked logs, likely from spruce or fir trees, dominates the foreground. The logs are cut into various lengths and are stacked in a somewhat haphazard but dense manner. The ends of the logs show the characteristic growth rings of the wood. In the background, a clear blue sky is visible above a line of evergreen trees, suggesting a forest setting. The overall scene is bright and sunny.

# Thank You

Gardiner, B. and Moore, J.: Creating the Wood Supply of the Future, in Challenges and Opportunities for the World's Forests in the 21st Century, vol. 81, edited by T. Fenning, pp. 687–704, Springer Netherlands, Dordrecht., 2014.