French forests and forestry
High education in Nancy, France

Contacts :   **meriem.fournier@agroparistech.fr**
                    paulina.pinto@agroparistech.fr
                    valentine.lafond@agroparistech.fr
                    myriam.legay@agroparistech.fr
                    pierrick.priault@univ-lorraine.fr
                    marie-noelle.vaultier@univ-lorraine.fr

Meriem Fournier, current French coordinator

AgroParisTech is the French partner

since 2011 UNIVERSITÉ DE LORRAINE provides support to organize the second year in Nancy

INRAE is associated partner

Outlines

1. **French forests and wood industry in a nutshell**
2. **AgroParisTech, Nancy campus, an old forestry school included in a famous recent institution**
3. **Welcoming students, our offer and our demand**

French climates and soils are very diverse

Alpine	Mer Noire	Méditerranéenne
Anatolique	Boréale	Pannonique
Artique	Continentale	Steppique
Atlantique	Macaronésienne	

Source : Centre thématique européen sur la diversité biologique, 2005.

French forests are located on lands not used by agriculture
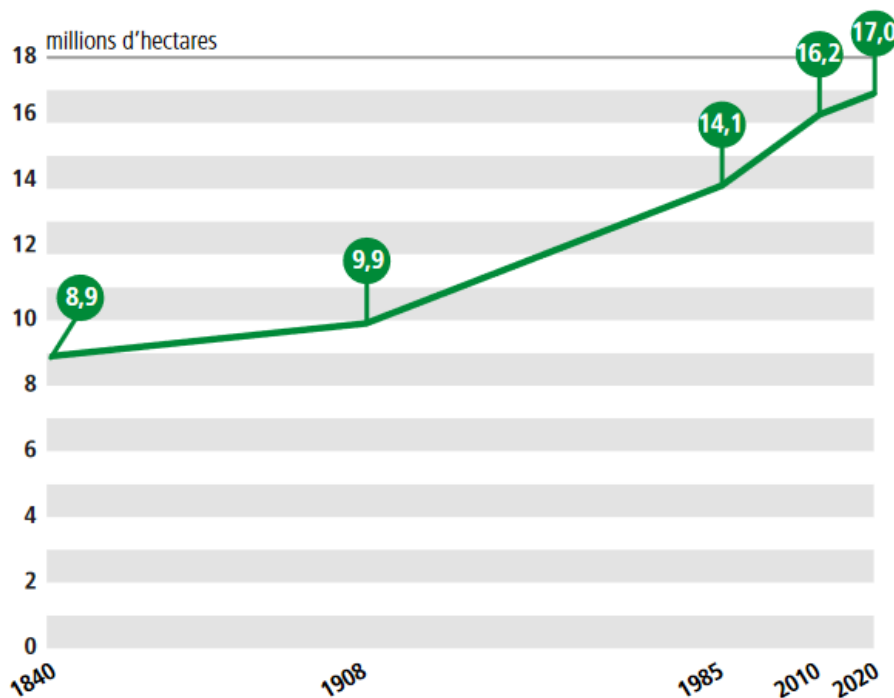
as mountains

© Philippe Lacroix ONF

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French forests are on located on lands not used by agriculture

as poor sandy soils

As many european forests, the French forest is increasing

millions d'hectares

- 1840: 8,9
- 1908: 9,9
- 1985: 14,1
- 2010: 16,2
- 2020: 17,0

A huge increasing since 1 century,
(50 000 to 80 000 ha/year)

**Stocks : 1.7 billion m3 in 1981 and 2.8 in 2021
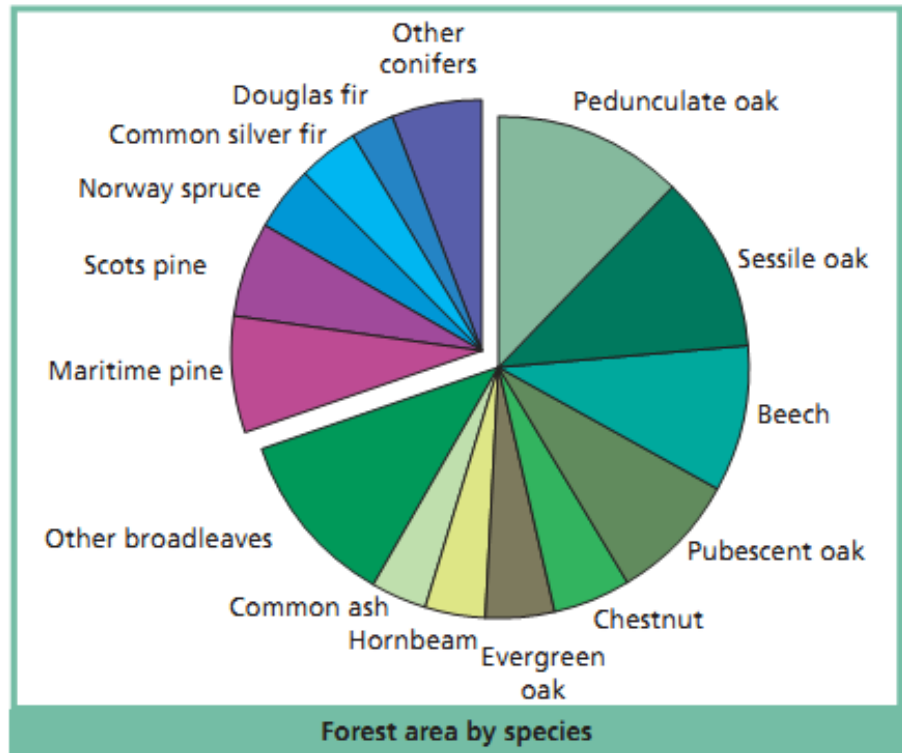+ 28 millions of m3 each year during the last 40 years**

NFI data, IGD IGN 2020

French forests are diverse and dominated by broadleaves

140 species
(European French
Forests)

74 indigeneous

Forest area by species

Source NFI

A high diversity of silvicultures with current debates

Even aged high forest (62%)

Unevenaged high forests
Continuous cover, mixed

Conifer plantations

(Plantations and planted forests 13%
7% made of exotic species mainly Douglas fir)

Coppices (7%)

Coppice with standards

Biodiversity conservation

Forests are involved in the national strategy of protected areas (« SNAP »)

18.5 % of forest area in the Natura 2000 network

Only 2% in strongly protected areas (core of national parks …)

✎ This is very low, in comparison for instance to Scandinavia and North America. It is historically explained by the landholding structure and the high population density

Current discussions to include the concept of "old growth forests" in the national indicators.

A new national park, entirely covered by forests

Called « National park of forests »

Created in 2019

The first park in wooded lowlands (unevenaged broadleaved)

240 000 ha
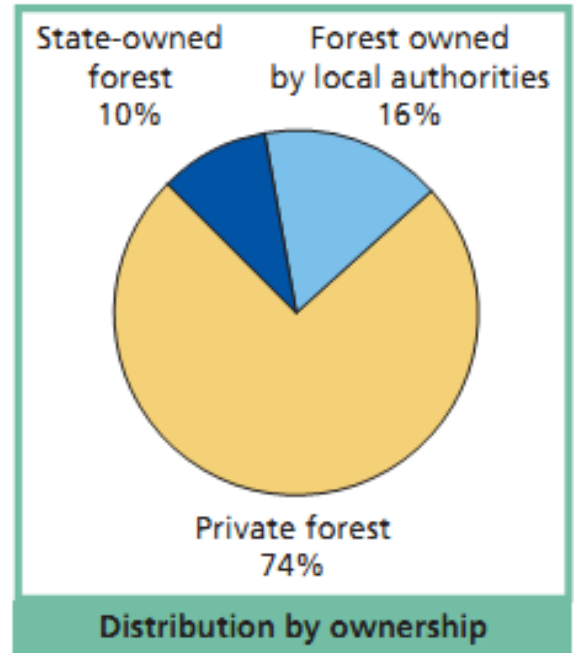
3000 ha of strict biological reserve

French forests are mainly private

76% private
24 % public (only 10% state forests)

= The result of history with strong regional discrepancies

State-owned forest 10%

Forest owned by local authorities 16%

Private forest 74%

Distribution by ownership

Volumes, increment, fellings and wood uses

NFI data (mean values, 2012-20)

Biological production   87.8 Mm³/y   -
Natural mortality   11.4 Mm³/y   +
Harvesting   (51 Mm³/y)   +
                    24.2 hardwoods, 26.7 conifers
                              Timber : 52%
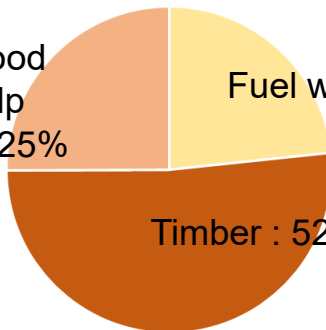
Difference = Self consumption

Industry data   Total harvesting :   (40 Mm³/y)

(source FCBA 2022)

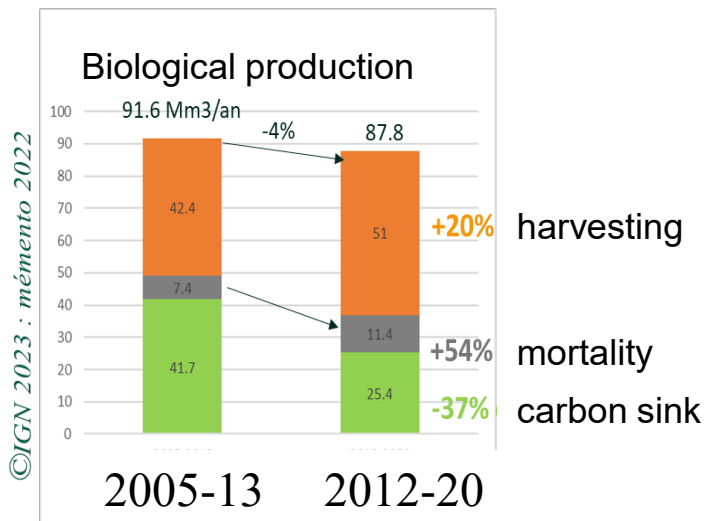Industrial wood including pulp and paper : 25%

Fuel wood : 23%

Timber : 52%

Climate change impacts :

The forest carbon sink is currently decreasing

NFI data

Biological production

91.6 Mm3/an   -4%   87.8

2005-13	2012-20	
42.4	51	**+20%** harvesting
7.4	11.4	**+54%** mortality
41.7	25.4	**-37%** carbon sink

©IGN 2023 : mémento 2022

-> Pay more attention to carbon storage in wood products and to substitution of renewable carbon to fossil one by increasing wood uses.

Challenges for the future (1)

- **Adaptation of climate change : risk mitigation, transformation of forests and forestry is a necessity**

- **Make wood-based bioeconomy a successfull strategy for sustainable development : cascading uses (and recycling and reuse), better use of hardwoods, stimulation of private forest owners, better resource assessment …**

- **Giving more value to ecosystem services (other than wood production) as pure water, air cooling, biodiversity, recreational uses, climate change mitigation … produced by forest management and wood uses**

- **A better communication between foresters and society**

AgroParisTech

Campus of Nancy

an old forestry school included in a famous recent institution

![AgroParisTech]

Key facts and figures

- National Institute of Technology for Life, Food and Environmental Sciences
  - ➢ An institute created in 2007… but with an history of 200 years
- French leading "*Grande Ecole*" (Elite higher education institution) in life sciences
  - ➢ Training programs from master level (Flagship French MSc in engineering "diplome d'ingénieur", MSc, PhD …)
- Our missions:
  - ➢ Education, research, outreach, entrepreneurship and innovation
- Our Disciplines:

• Plant Sciences	• Nutrition and Health Sciences	• Water Engineering
• Animal Sciences	• Biotechnology and Green	• Remote Sensing
• Agronomy	Chemical Engineering	• Ecotoxicology
• Food Sciences	• Forestry	• Economics and Social
• Ecology	• Microbiology	Sciences
• Data Science and AI	• Soil Sciences	• Bioclimatology
		• Statistics and Mathematics

AgroParisTech

- 7 AgroParisTech campuses
- 5 are concerned by forests and forestry (+/-)
- Nancy leads forest-related teaching

Paris & Ile-de-France

Nancy

Kourou Guyane
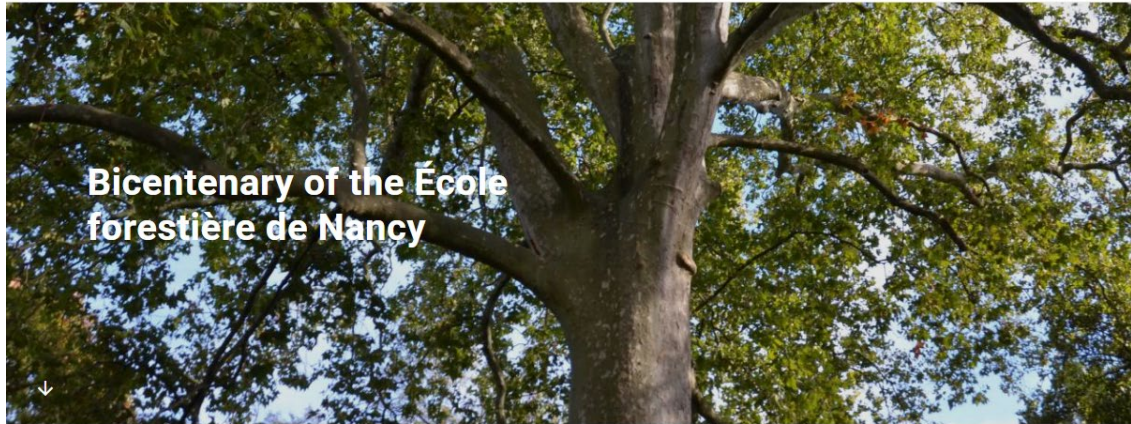
Clermont-Ferrand

Montpellier

Nancy coordinates forest research and high education at AgroParisTech

AgroParisTech Campus of Nancy

Founded in 1824-25 (200 years old!), located downtown in the historical site

Bicentenary of the École forestière de Nancy

Closing symposium : "Sustainably Managing Forests in 2050: Building the skills for the future leaders worldwide"

Location : AgroParisTech, Nancy campus

27/28 November 2025

AgroParisTech Campus of Nancy

Through joint ventures between

> ## 250 students (MSc, PhD) per year

Master of Sc and PhD *programs in :*
Forest sciences and enginering, Wood
sciences and forest-wood value chain, Ecology,
Nature management, Plant sciences
Environmental economics.

A double degree with ENSTIB (and with others)

> ## 50 permanent researchers and teachers

> ## 3 Research Units

• SILVA (forest ecology, tree biology, silviculture, wood formation and quality)
• BETA (forest and environmental economics)
• LIF Forest Inventory Lab (IGN)
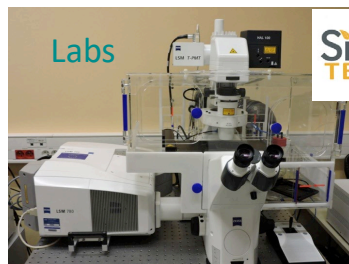
Research and innovation facilities

AgroParisTech · UNIVERSITÉ DE LORRAINE · INRAE science for people, life & earth · IGN INSTITUT NATIONAL DE L'INFORMATION GÉOGRAPHIQUE ET FORESTIÈRE

Field facilities

Eddy flux tower of Hesse (57)

Mobile platform M-POETE

Livinglab

FOREST INN LAB

BILJOU
Forest water balance model
INRAE - Silva Joint Research Unit

Support to decision tools

Silvicultural experiments

Labs

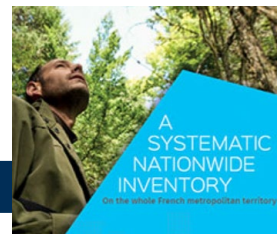Silva TECH

Large data bases

Journal of Vegetation Science
Advances in plant community ecology

A SYSTEMATIC NATIONWIDE INVENTORY
On the whole French metropolitan territory

🔓 Full Access

EcoPlant: A forest site database linking floristic data with soil and climate variables

Jean-Claude Gégout ✉, Christophe Coudun, Gilles Bailly, Bernard Jabiol

Forest system models

A carbon accounting tool for complex and uncertain greenhouse gas emission life cycles

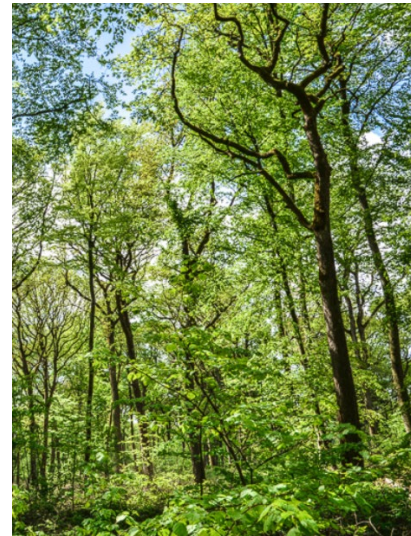Article in Environmental Modelling and Software - June 2018

French Forest Sector Model: version 1.0.
Presentation and theorical foundations

AgroParisTech Campus of Nancy

School forest: Forest of Brin

➢ 600 ha

➢ 20 km from Nancy

➢ Multiple values
- Wood production (oak and beech)
- Hunting
- Recreation
- Biodiversity, water management (pond)
- History (battlefield of the two world wars)

➢ Multiple risks: climate change, pests…

Demand to foreign partners in high education in forestry and forest sciences

➢ Since the creation of AgroParisTech (2007), we in Nancy have joined a general flagship « ingénieur » program (3 years) in life and environment sciences (400 students/year).

➢ As we need to train foresters (30 to 50 / year) within this degree in Nancy, we have developed, for the last 2 years of this curriculum, a consistent specialized program that issues an additional specific degree **SIF** in « forest science and engineering » based on 4 semesters <u>with a list of skills</u>.

➢ But now, the French rules will impose at least 16 weeks abroad during the 3 years of the « ingénieur » degree.

➢ So, we need to rethink our current program to be able to send our students abroad during the 4 SIF semesters , ensuring these students will develop, <u>during this period abroad, skills in forest science and engineering</u>, included in our SIF degree.

➢ We need a renewed consistent strategy of partnerships with **specialized curriculum (at Master level) in forest science and management.**

Offer to foreign partners in high education in forestry and forest sciences

➢ Through our general master of Sc program, we have developed one semester entirely taught in english in forest ecology and management, called « FEN » Forests and their environment.

➢ **We aim to welcome both French students and non-French speakers in this semester**. Up to now, non-French speakers are mainly Erasmus Mundus European Forestry students. But it is desirable to broaden this recruitment to other non-French speaking students (other double degree with shared courses and master thesis, or simple erasmus semesters) .

➢ To do that, we would like to develop partnerships and then, Paulina will explain you more accurately what our master of Sc program is.

Thank you for your attention