



After Paris.

**Burden-sharing and the role of forestry
in climate change mitigation**

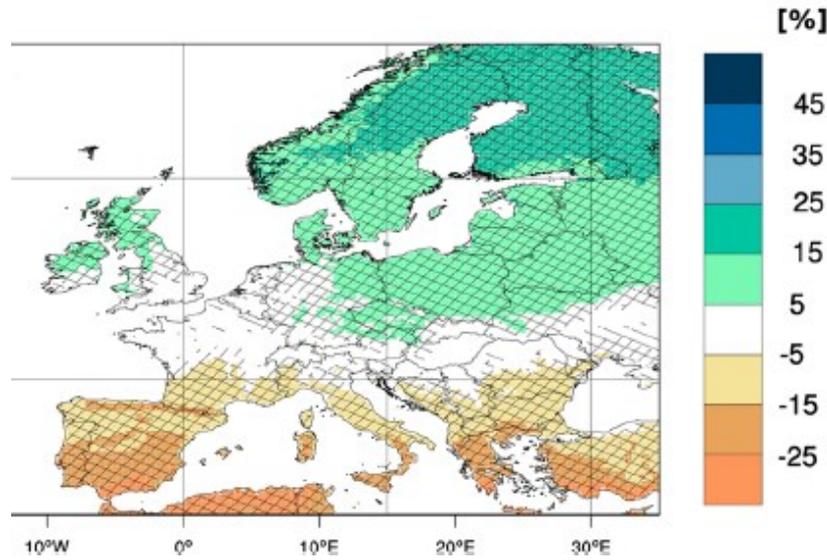
**Some relevant features of French forests and
outlines for propositions**

Jean-Marc Guehl

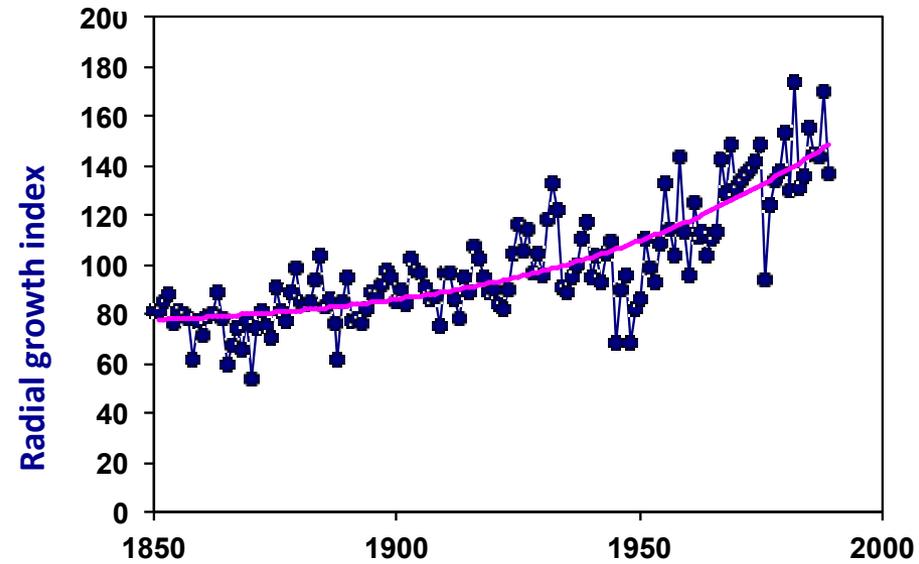
INRA Nancy



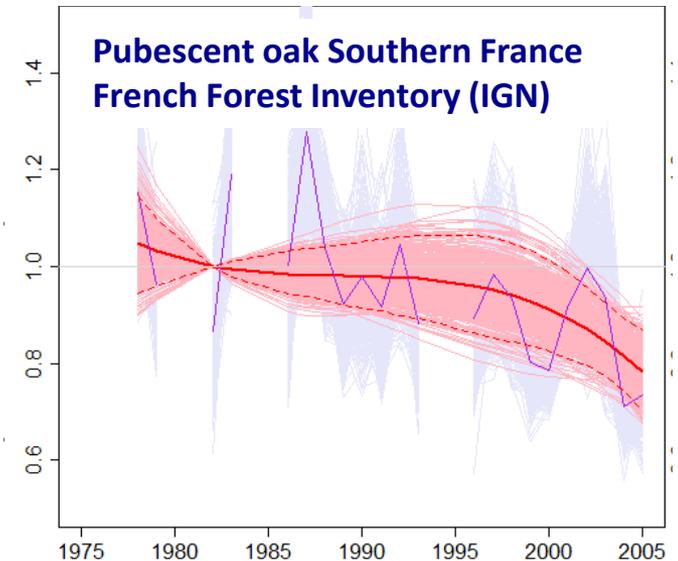
Expectations for climate change impacts: uncertainties and regional contrasts



Common beech North-East France (1015 trees)



Pubescent oak Southern France
French Forest Inventory (IGN)



Prédictions rainfall change scénario A1B1
2071-2100 vs 1971-2000.
EURO-CORDEX

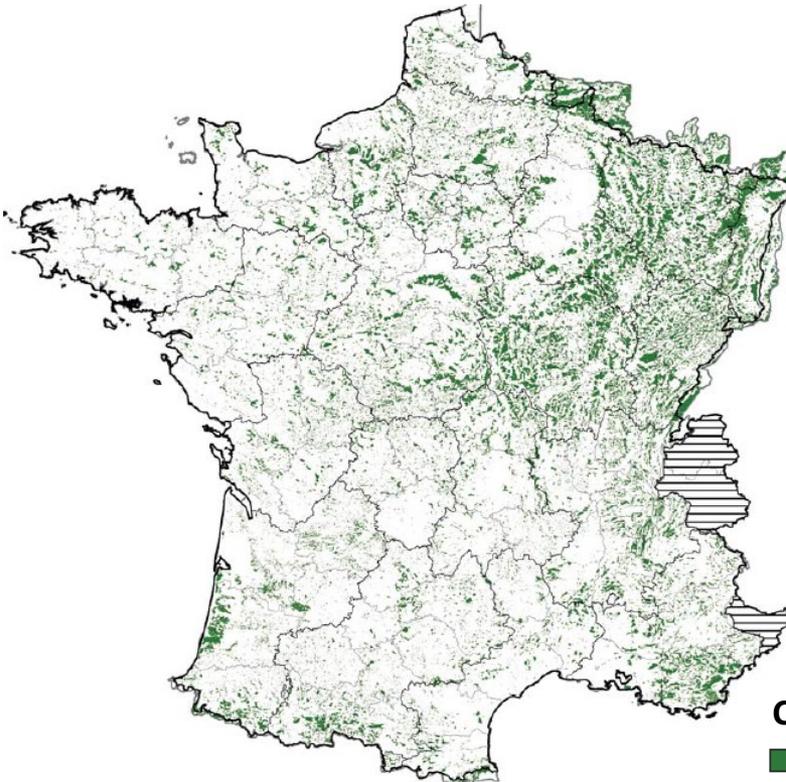
Ancient and recent forests with contrasting features



1830: *ca.* 9 Mha

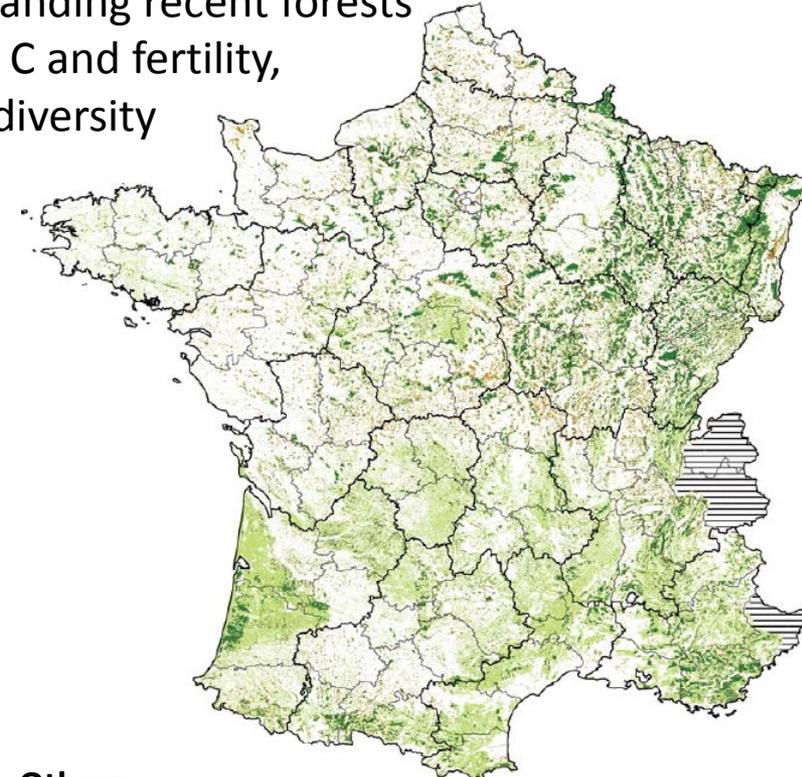
Present: 16.7 Mha

Cassini's forests (*ca.* 1770)



Current forests (Corine Land Cover 2006)

Expanding recent forests
Soil C and fertility,
biodiversity



Cassini's forests

- Ancient forest nuclei
- Currently deforested
- Not mapped

Others

- Other woodland today
- Non forested since Cassini

An assessment of the contribution of the French forests to the mitigation of greenhouse gases increase

- Data and results: IGN (Antoine Colin), CITEPA, ADEME, GIP ECOFOR
- Hypothesis 1 m³ Wood équivalent to 1 t CO₂ (1t eqCO₂)

Forest Inventory 2013	Smallwood (>7cm)	Total wood volume
Standing stock (trees)	2636 Mm ³	4866 Mm ³
Gross biological production	92 Mm ³	170 Mm ³
Mortality	9 Mm ³	
Harvest	43 Mm ³	
Stock increase = Sequestration	40 Mm ³	74 Mm ³
Storage wood products*		2 Mm ³
Substitution* of non renewable carbon (avoided emissions)		27 Mm ³

15%
of GG
émissions

20%

* Substitution is shared between materials and bioenergy (the figures here are low estimates)

✧ No account of C accumulation in dead wood, litter and soils

IGN, Institut National de l'Information Géographique et Forestière
 CITEPA, Centre Interprofessionnel Technique d'Etudes de la Pollution Atmosphérique
 ADEME, Agence de l'Environnement et de la Maîtrise de l'Énergie
 GIP ECOFOR, Groupement d'intérêt Public sur les Ecosystèmes Forestiers

Medium-term simulations of changes in mitigation potential of French Forests according to two *scenarii* (Antoine Colin IGN)

- **Business as usual (+ 100 000 ha/year). Unchanged harvest regime (only demographic effect).**
- **Dynamic scenario with unchanged forest area increase (+ 100 000 ha/year). Increased harvest rate.**

<u>Business as usual</u>	2013	2030
Séquestration	74 Mt CO ₂	89 Mt CO ₂
Storage wood products*	2 Mt CO ₂	2 Mt CO ₂
Substitution*	27 Mt CO ₂	34 Mt CO ₂
TOTAL	103 Mt CO₂	125 Mt CO₂



<u>Dynamic scenario</u>	2013	2030
Séquestration	74 Mt CO ₂	53 Mt CO ₂
Storage wood products*	2 Mt CO ₂	14 Mt CO ₂
Substitution*	27 Mt CO ₂	45 Mt CO ₂
TOTAL	103 Mt CO₂	112 Mt CO₂

* *Values to consolidate*

Assessment in favour of the BAU scenario (high carbon debt of the French long felling cycle forests).

However :

- ✧ **Substitution becomes more important for longer term evaluations.**
- ✧ **Decreasing growth and increasing mortality and vulnerability to climatic extreme events are foreseen for the BAU scenario after 2030 (stand ageing).**

Some outlines of the French viewpoint

- ✧ The French strategies **simultaneously** consider the challenges of **adapting forests** to climate change, of maintaining **the forest carbon sink** as well as the **role of wood in the short and long-term mitigation pathways**.
- ✧ First, they are intended to **prevent a annulment or reversal of forest sinks** by the end of the century due to maladaptation of forests to climate change. **Adaptive management** is needed to reduce risks.
- ✧ Merely favouring carbon accumulation in forests may increase **the vulnerability to climate change** (*storms, extreme droughts, heat spells, pests and diseases, fires*).
- ✧ They are also focused on enhancing the **mitigation potential of a wood based bioeconomy**, enabling a reduction in emissions in other sectors through the **substitution** of energy-intensive materials in substitution of fossil fuels
- ✧ Strategies, are planning a **reasoned increase in forest harvesting**, so a reduction in the forest sink activity, by 2030. The aims are
 - to optimize **uses of wood by cascading effects** (material for construction, recycling, energy),
 - To promote a **more dynamic management** favouring the **adaptation** of forests to climate change and taking into account the preservation of **biodiversity**

Elements of the relevant legal framework

- ✧ Law on the future of agriculture and forests (LAAF) stating the interest of storage of carbon by forests and wood.
 - the National Programme on Forests and wood
- ✧ Strategies issued from the energy transition law for green growth (LTECV)
 - National Strategy Low Carbon (published)
 - Multiannual programming of energy (being adopted)
 - National Strategy for mobilization of biomass (NBS) under development,

The input by colleagues of the Ministries in charge of Environment and energy and in charge of forests is acknowledged!

Sylvie ALEXANDRE and Jean-Paul TORRE, Catherine Rivoal.