



# Laboratory of Forestry Economics

UMR 356 AgroParisTech (ENGREF) - INRA

IUFRO, Paris, 27 /5/ 2010



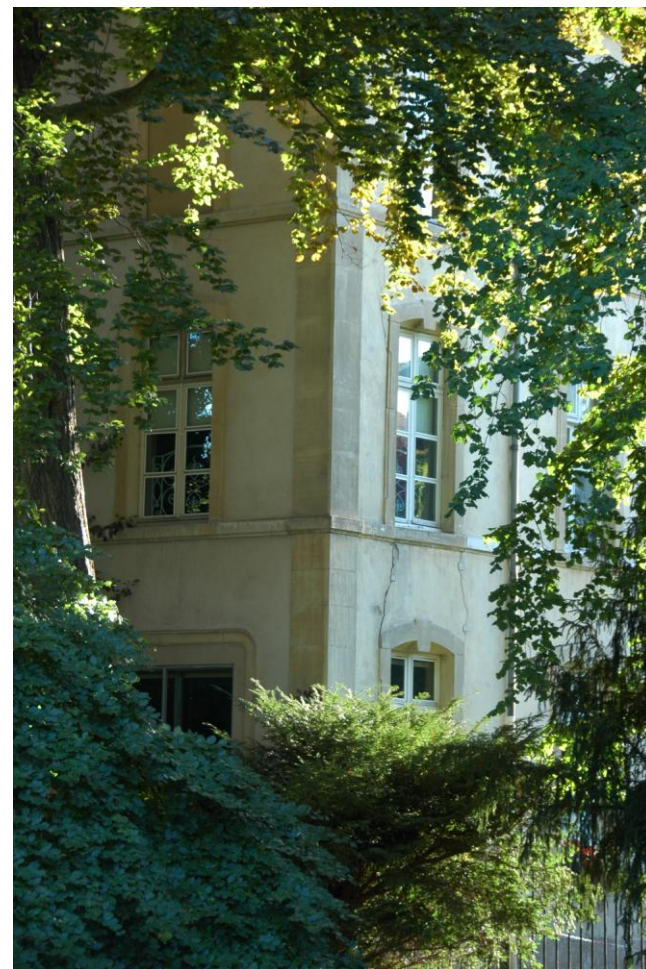
# LEF is a laboratory of applied economics, whose main focus is forests and the forest sector

- Forests cover 28% of French territory (EU 27: 37%)
- The forest sector employs 500,000 people in France—1.8% of French working population.
- Forests produce timber and multiple goods and services, some market (e.g., hunting), and other non market (e.g., recreation, biodiversity protection, or water quality)
- Demand for wood (and non wood) is increasing rapidly.
- Impact of Climate change on forest uses: wood (production) and non wood (environmental functionalities, GHG emission, hydrology, soil carbon storage)



# LEF in brief

- Joint research unit between INRA and AgroParisTech, LEF is an applied economics research team
- Our core object: Forest and the Forest Sector
- Inserted within the Nancy forestry research pole, LEF builds on three decades of forestry and agricultural economics research at ENGREF Nancy.
- LEF has important research, expertise and teaching responsibilities





# A team of 26

- **Researchers (9):** Jens Abildtrup, Max Bruciamacchie, Marielle Brunette, Sandrine Costa, Philippe Delacote, Serge Garcia, Jacques Laye, Franck Lecocq, Anne Stenger
- **Associate professor (2):** Eric Langlais, Patrice Harou
- **Engineers and technicians (8):** Ahmed Barkaoui, Ibrahim Favada (OEF), Eric Kervégant, Claire Montagné, Alexandra Niedzwiedz, Jean-Marc Rousselle, Benoit Vandenbroucke, Guillaume Zardet
- **Support staff (2):** Sylvie Beaugeois-Geller, Evelyne Lenel
- **PhD students (5):** Sylvain Caurla, Ophélie Darses, Eric Kéré, Gérard Marty, Nicolas Robert



# Approaching forests and the forest sector with multiple tools

- LEF researchers use **multiple economic approaches** to study forest and the forest sector:
    - “Traditional” forestry economics, environmental economics, economics of risk and uncertainty, economic modeling, experimental economics
  - Given our research topics, we have many **interdisciplinary projects**
    - Forest ecology and silviculture, forest management, environment science, sociology
  - **Three main research programs**
    - Risks, insurance, and adaptation to climate change
    - Forest sector modeling
    - Economics of multifunctionality
- + Forest economics data group



# Program 1: Risks, Insurance, and Adaptation to Climate Change

**Objective:** Assess risks (both natural and market) implications for forest management, and evaluate risk-mitigation strategies both at the forest owner and at the policy level, including insurance, and taking climate change into account.

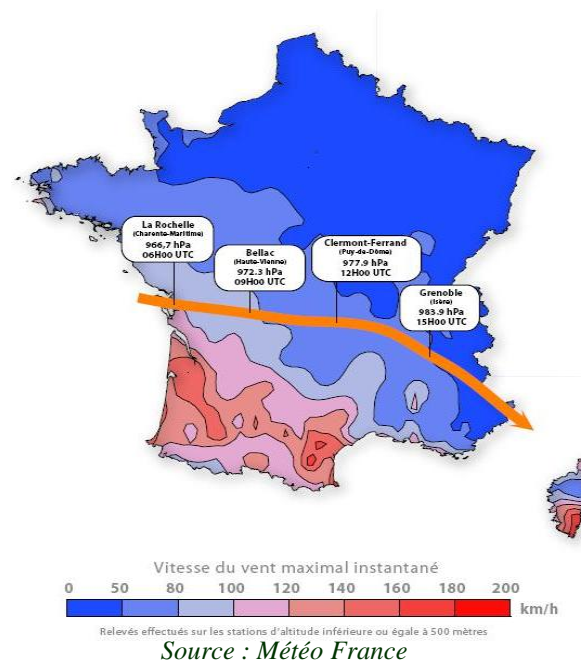
**Methods:** Forestry economics and forest management, economics of risk and insurance, experimental economics

## Some recent results:

- Wood storage after the 1999 hurricanes has not been cost-effective despite public subsidies. Economic results are better where storage is durable and for softwood areas.
- Public transfers in the case of catastrophic events create a counter-incentive to forest owners insurance and auto-insurance. Transfers conditional to insurance would be preferable from a global welfare perspective.
- 2009 Klaus hurricane has led to an economic loss of circa €1.7b for maritime pine forest owners. The most important part of this loss comes from drop in timber market value.
- With natural risks of constant annual probability, « normal » forest management remains economically optimal.

Tempête du 24 janvier 2009

Trajectoire du centre de la dépression



**Costa, Sandrine, et Lisette Ibanez.** 2005. "Can wood storage be profitable ? French experience after the windstorms in 1999." *Journal of Forest Economics* 11(3): 161–176.

**Brunette, Marielle, et Stéphane Couture.** 2008. "Public Compensation for Windstorm Damage Reduces Incentives for Risk Management Investments ." *Forest Policy and Economics* 10(7-8): 491–499.

**Couture, Stéphane, et Arnaud Reynaud.** 2008. "Multi-Stand Forest Management Under a Climatic Risk: Do Risk and Time Preferences Matter?" *Environmental Modeling and Assessment* 13(2): 181–193.





# Program 2: French Forest Sector Model

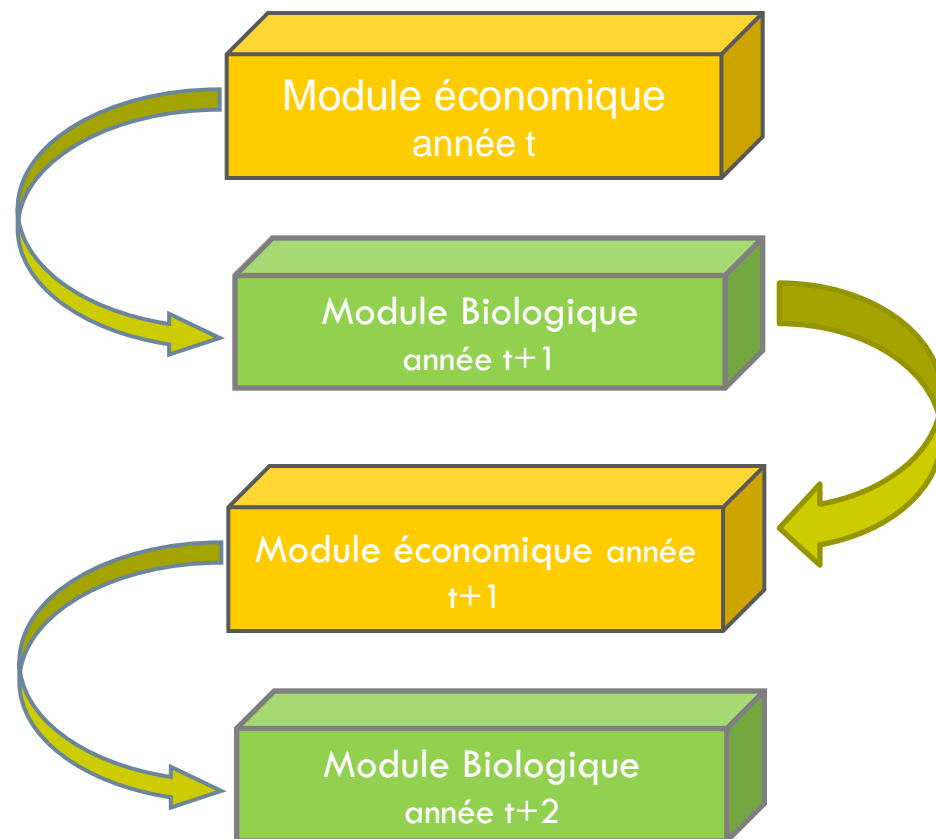
## ■ Objectives:

- Understanding climate-related policy impacts on the forest sector and scope for mitigation in the forest sector
- Assess biomass energy development implications for the forest sector
- Evaluate economic implications for climate change on forest sector, and adaptation strategies

## ■ Methods:

- Forest sector modeling (from the forest to final demand)
- Long-run perspective
- **Coupling between economic and ecological modules**

## ■ Partnerships: ONF, LERFOB, IFN, Région Lorraine, MAP



Sylvain Caurla, Philippe Delacote, Franck Lecocq et Ahmed Barkaoui. *Fuelwood Consumption, Uncertainty over Resources and Public Policies: What Impacts on the French Forest Sector?* Cahier du LEF 2009-03 (2009)

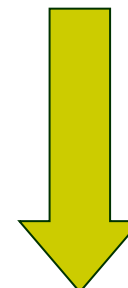
S. Caurla, P. Delacote, F. Lecocq et A. Barkaoui. Retribution of carbon sinks in forest biomass Vs stimulation of timber consumption: what impacts on the French forest sector?

A. Sauquet, P. Delacote, S. Caurla, F. Lecocq et A. Barkaoui. Introducing imperfect substitutability in international trade of forest sector models: the case of the French Forest Sector Model



# Program 3: Economics of Multifunctionality

- **Objective :Which function(s) to conserve, to develop at which forest spatial unit ?**
  - Theme 1: Multifunctionality Demand (non wood services)
  - Theme 2 :Multifunctionality supply (forest owner)
  - Theme 3: Public policies analysis
- **Methods**
  - To identify the determinants of the demand side of the multifunctionality components
  - To model the supply side, taking timber and non timber aspects
  - To analyse public policies implementation (contracts)
  - To introduce some spatial components (spatial econometrics, GIS)
- **Expected results:**
  - understanding and identifying the functions of (in) the forests
  - analysing their jointness
  - designing policy tools at different management scales (stands,massif, territory)





# Program 3: Valuation of water purification service provided by forests



Source : DRAF Lorraine

Joint research activity between LEF and the French Private Foresters Association (CNPPF)

**Objective:** Quantify the water purification service provided by forests and devise contractual instruments to value this service

**Methods:** Econometrics, economics of contracts, strong link with biological sciences

**Research plan:** Analysis of water purification service provided by forests on pilot sites in France

- Definition of technical constraints
- Quantification of the value of the service (costs of production, willingness to pay of individuals)
- Designing model contracts between municipalities and forest owners

## Expected results:

- Economic valuation of the water purification service provided by forests
- Contractual instruments that can be used by forest owners and municipalities

Fiquepron, Julien, Serge Garcia, et Anne Stenger. 2008. Mesure de l'impact de la forêt sur le prix et la qualité de l'eau à l'échelle d'un territoire.

Helle, D. et al. 2008. "Deux exemples de gestion forestière pour l'eau potable : Rennes (35) et Masevaux (68)." *Rendez-vous Techniques* (22): 39–43

# Program 3: Non industrial forest owners production behavior in France

**Objective:** Understanding the attitude of French non-industrial forest owners (<25ha) relative to their forests (timber production, but also biodiversity conservation, etc.), analyze what public policies can provide incentives to these owners, alone or in group, to produce more timber and / or environmental services, estimate the jointness between wood and non wood

**Methods:** econometrics, game theory, public economics, economics of contracts

**PhDs of** Eric Kéré, Nicolas Robert, and Ophélie Darses

Research in partnership with the French  
**Forest Inventory Service**



Source : IGN

**Expected results:** Advice for the design of contracts among forest owners and between forest owners and biomass energy users, and advice on public policies to adopt in this area

**Kéré, Eric.** 2008. "Analyse économétrique de la consommation des ménages en bois énergie." Mémoire. Master Nancy (FRA) : Université Nancy 2. 53p.

Darses, O, 2009, « Mobilisation de la ressource bois chez les propriétaires forestiers privés: une approche par l'économie de l'information et des contrats », Mémoire Master Paris EDDEE, 99p.



# Forest economics data group

- Motivation
  - Need for data for research and expertise
  - Economic data on forest sector very sparse
- Methods:
  - Integration of data from various sources into unique database
  - Service of data provision inside and outside LEF
- Partnerships
  - IFEN, INSEE, IFN, Eurostat, SCEES, Forêt privée, etc.
- Valorisation
  - Contributions to research, training and expertise
  - Support to the Economic Observatory of the French Association of Forest Sector Professionals (France Bois Forêt)
  - Collaboration with the European Forest Institute (OEF) in Nancy of the European Forest Institute





# Example of other activities: Economics of ecocertification

**Objective:** To understand the implications of ecocertification development for wood product supply, demand, and in fine implications for markets

**Methods:** industrial economics, economic analysis of consumer preferences, marketing, experimental economics



Source : Prioriterre



Source : F. Lecocq/LEF



Source : Forest Stewardship Council

**Results:** If consumers do not sufficiently perceive the difference in environmental quality between certified and non-certified products, the development of an eco-certified wood product market can be good for distributors, consumers, but not for the producers at the origin of it

**Expected results:** Understanding consumers motivation for purchasing certified wood products, and implications for marketing

**Costa, Sandrine et Lisette Ibanez.** 2007. "Certification of sustainable forest management: differentiation strategies and asymmetric information." *International Journal of Agricultural Resources Governance and Ecology* 6(3): 393–414.

**Ibanez, Lisette et Jacques Laye.** 2008. "Ecocertification, differentiation in retailing and upstream market power." *International Journal of Agricultural Resources, Governance and Ecology* 7(1-2): 158–173.



# Selected expertise to which LEF has recently contributed

- IPCC Fourth Assessment Report
- Forest management and Carbon (French Forest Service)
- Agriculture / Forest GHG emissions scenarios 2020 (Ministry of Agriculture)
- Support to the construction of indicators about the forest sector (Ministry of Agriculture)
- Forest sector accounting (Institut Français de l'environnement for EUROSTAT)



# LEF staff contributes to teaching

- Main fields of teaching: **economics** and **forest management**
  - Forestry economics, cost-benefit analysis, environmental economics, natural resource economics, carbon projects and forestry, etc.
- Total teaching contribution > 3 full-time professors
  - AgroParisTech: engineering, MSc and PhD programs
  - Université Nancy 2





# National and International Partnerships

	France	Europe	World
Wood / Forest	INRA Wood / Forest Centre in Nancy	NFZ ForestNet	IUFRO
Forestry Economics	GIP ECOFOR	EU Projects MEDFOREX, EFORWOOD, NEWFOREX, COST Actions (E45) SSFE	Yale School of Forestry, U. Maine SOFEW
Economics (non-forestry)	Several research units, INRA economics department	EAERE, EARIE, EEA	World Bank



# Selected Publications

- Marielle Brunette and Stéphane Couture, "Public Compensation for Windstorm Damage Reduces Incentives for Risk Management Investments," *Forest Policy and Economics* 10, no. 7-8 (2008): 491-499.
- Sandrine Costa and Lisette Ibanez, "Certification of sustainable forest management: differentiation strategies and asymmetric information," *International Journal of Agricultural Resources Governance and Ecology* 6, no. 3 (2007): 393-414
- Stéphane Couture and Arnaud Reynaud, "Multi-Stand Forest Management Under a Climatic Risk: Do Risk and Time Preferences Matter?," *Environmental Modeling and Assessment* 13, no. 2 (2008): 181-193.
- Philippe Delacote, "Commons as insurance: poverty traps or safety nets?," *Environment and Development Economics* 14 (2009): 305-322.
- Serge Garcia, Patrice Harou, Claire Montagné and Anne Stenger, "Models for sample selection bias in contingent valuation: Application to forest biodiversity," *Journal of Forest Economics* 15, no 1-2 (2009): 59-78.
- Lisette Ibanez and Jacques Laye, "Ecocertification, differentiation in retailing and upstream market power," *International Journal of Agricultural Resources, Governance and Ecology* 7, no. 1-2 (2008): 158-173.
- Franck Lecocq and Zmarak Shalizi, "To Mitigate or to Adapt: Is that the Question? Observations on an appropriate response to the Climate Change Challenge to Development Strategies," *World Bank Research Observer* doi:10.1093/wbro/lkp012 (2009).
- Gérard Marty, "Path Dependence and Public Timber Auctions - Historical Analysis of the Social Construction of a Merchant Institution to Sell France's Public Timber," in *Hidden Dynamics of Path Dependency: Organizational and Institutional Path Processes*, éd. Georg Schreyögg and Jörg Sydow (Palgrave MacMillan) (2010): pp.148-160.
- Anne Stenger, Patrice Harou, and Stale Navrud, "Valuing environmental goods and services derived from the forests," *Journal of Forest Economics* 15, no 1-2 (2009): 1-14.
- Sign Anthon, Serge Garcia and Anne Stenger, "Incentive contracts for Natural 2000 implementation in forest areas". *Environmental and Resource Economics* (2010) (in press)



# Thank you!

**contact:** [lef@nancy-engref.inra.fr](mailto:lef@nancy-engref.inra.fr)  
**website:** <http://www.nancy.inra.fr/lef>  
**postal address:**  
Laboratoire d'Economie Forestière  
UMR ENGREF/INRA  
14, rue Girardet, CS 4216  
F-54042 NANCY Cedex, FRANCE  
**telephone:** +33 3 83 39 68 65  
**fax:** +33 3 83 30 22 54

