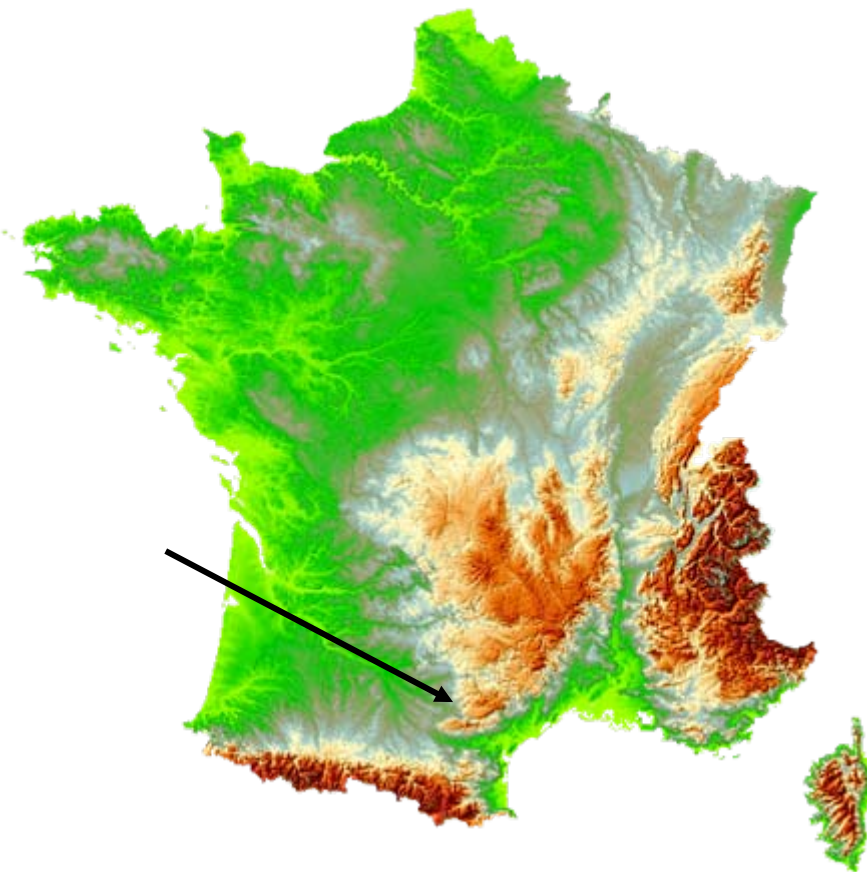


TARN FORESTS FACING CLIMATE CHANGE



DEPARTEMENT LOCATION







Consequences !

- For its privileged location :
 - Moderate altitude and strong steady precipitations.
 - Soils from weathering of old crystalline rocks.
 - Long growing season for its southern location.
- Tarn productive forest has always been thriven with no big trouble.
 - BUT

2003 Summer time happened!

Lacaune Ombrothermic diagram

- 1950-1977
- 2003

Diagramme ombrothermique Lacaune 1951-1977 (P = 3 T)

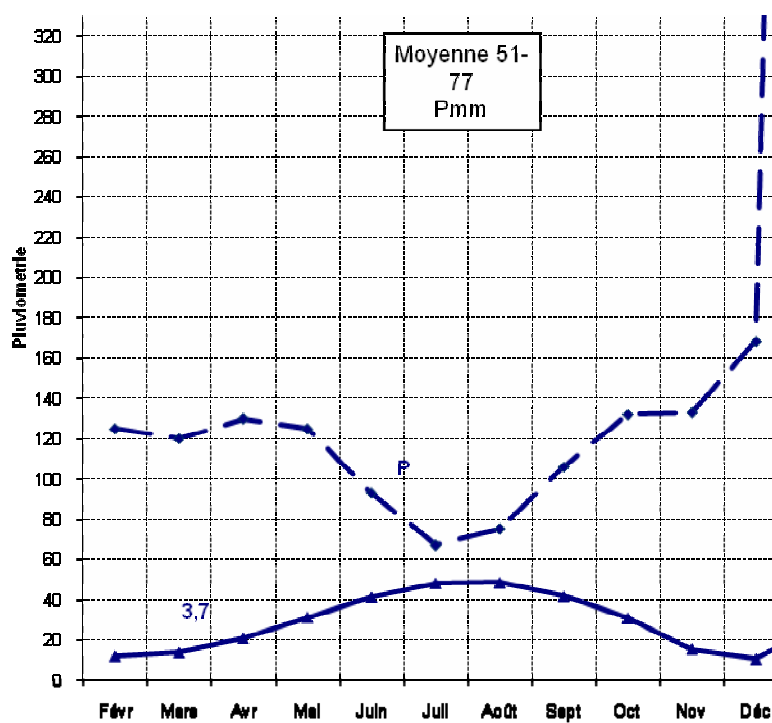
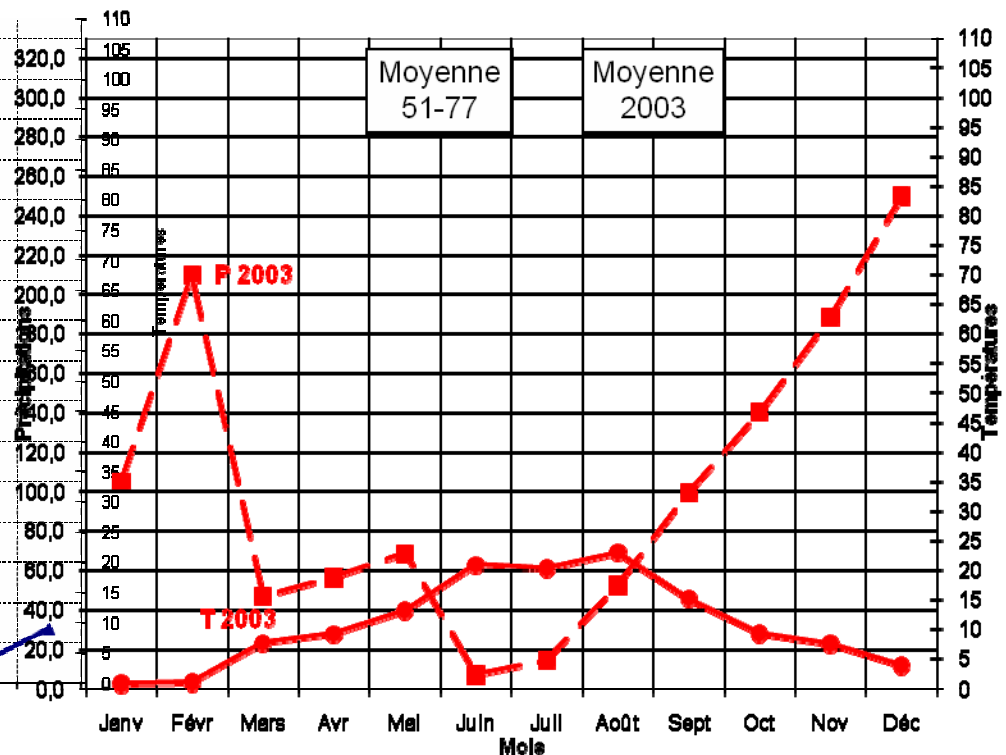


Diagramme ombrothermique de Lacaune 51-77/2003 (P=3T)

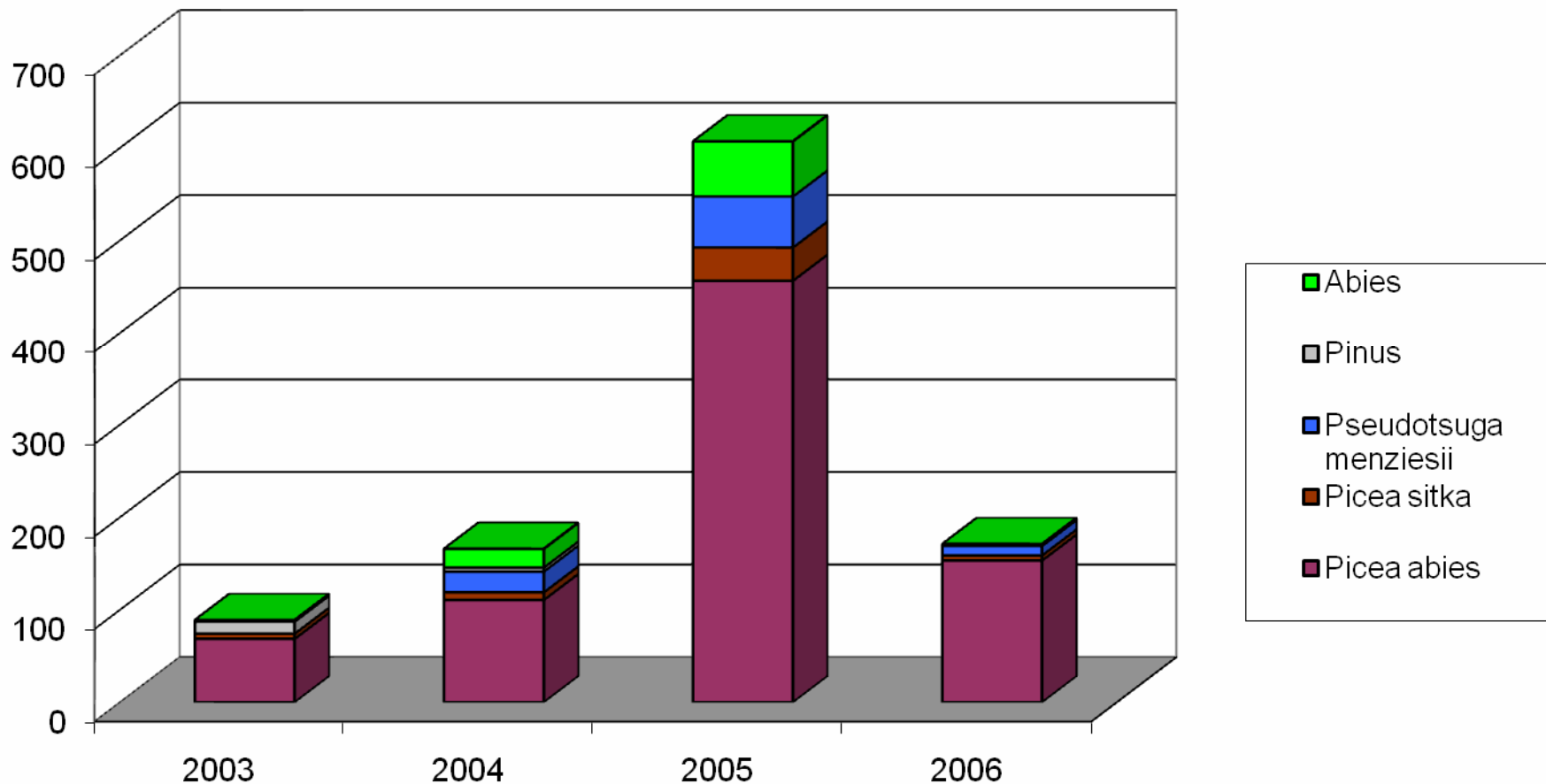


Consequences

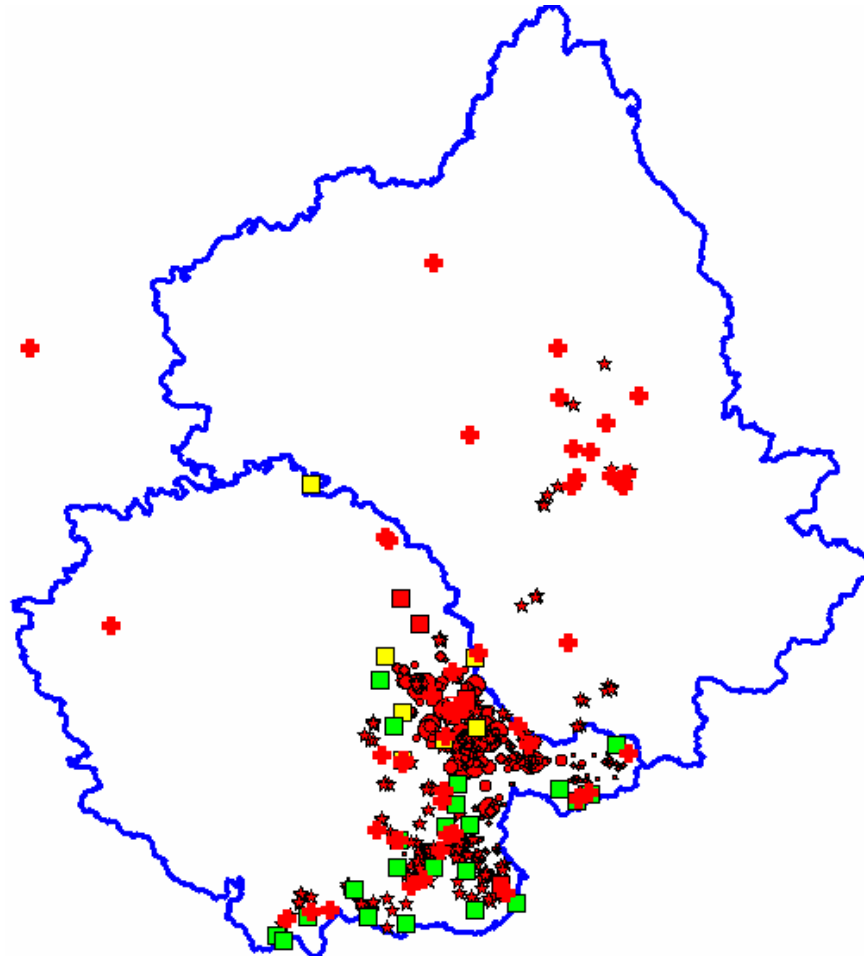


Damages chronology

Exceptional harvests area

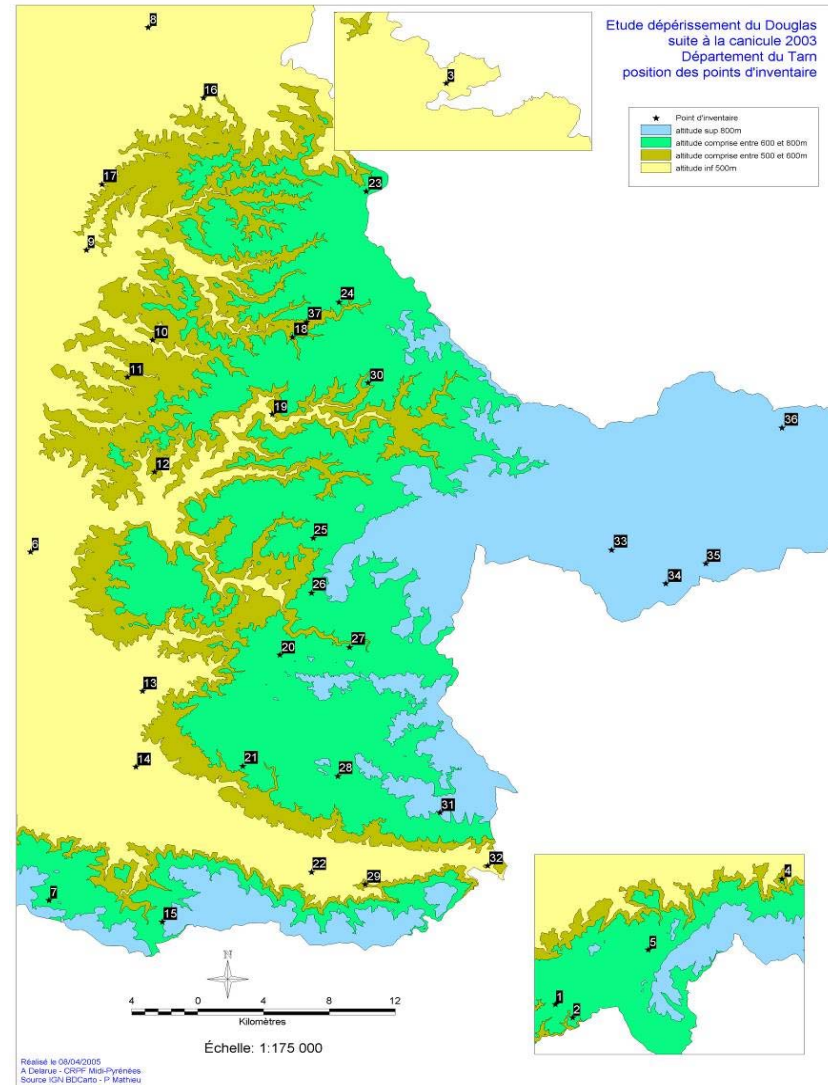


Location of exceptional harvests



Follow-up of *Pseudotsuga menziesii* stands

- 37 plots observed in:
- - 2005
- - 2006
- - 2007
- - 2008





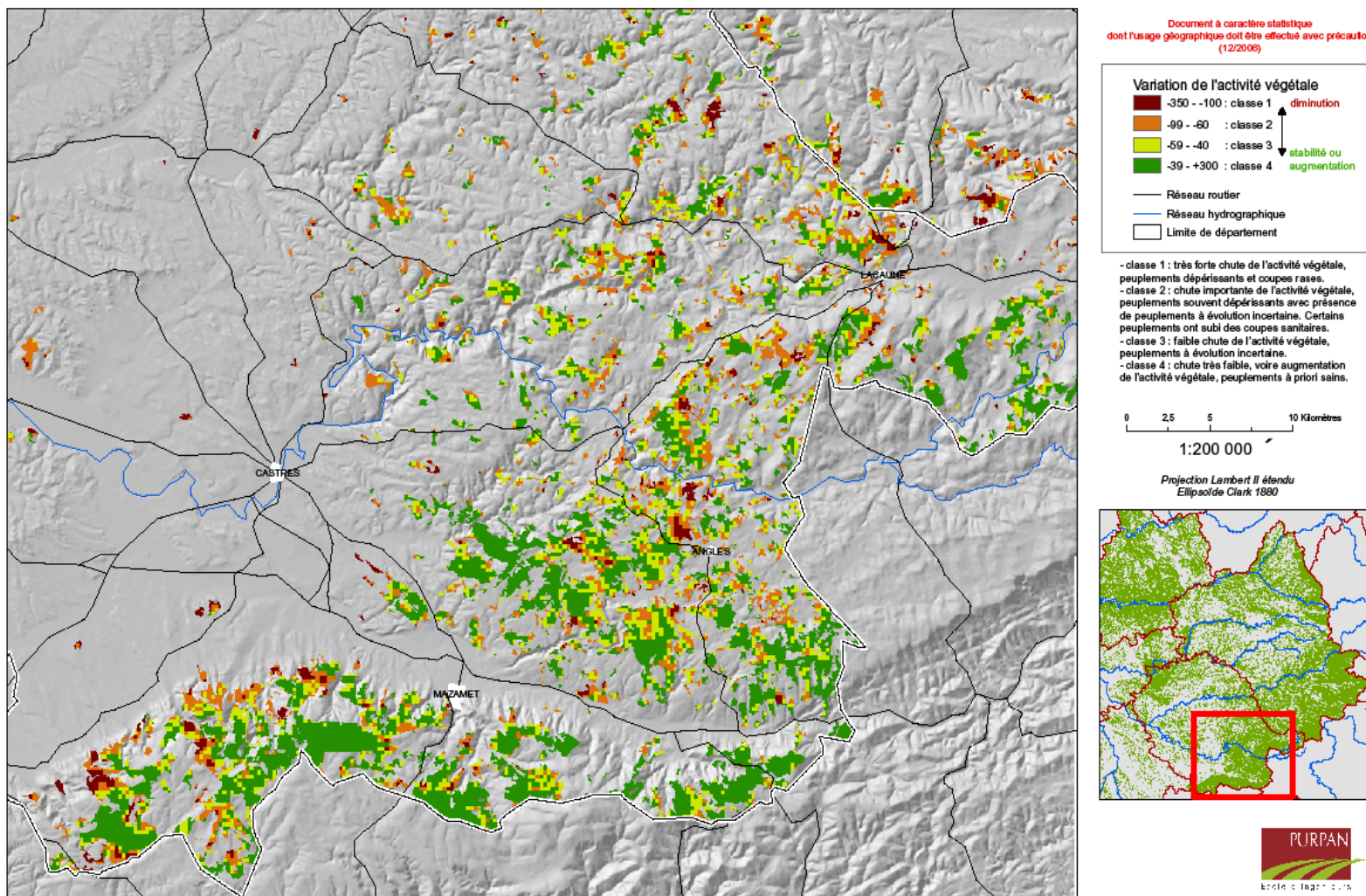
Follow-up of *Picea* stands

- 31 plots were observed in 2004



Follow-up by remote sensing

Change in spring vegetal activity for coniferous stands between 2000 and 2005

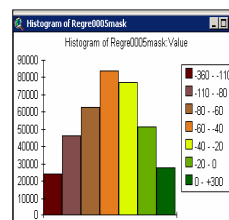
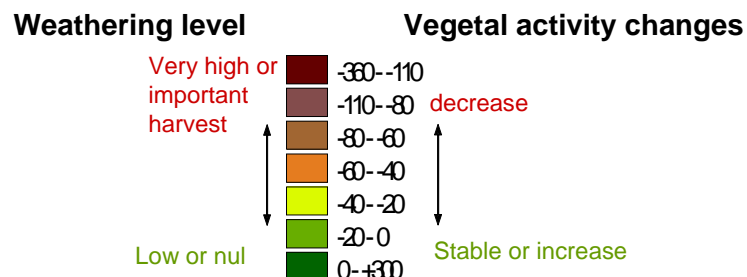


Follow-up by remote sensing

- « The approach relies on the analysis of a temporal set of images of vegetation index (NDVI) on the 2000-2005* period » (EIP 2005)
- Reused in 2005-2007.

Suggestion

- Map threshold of Regre values





Local response

- February 8th and 9th 2007, Tarn Forest House initiative, a meeting of several research organizations took place, were present at Mazamet:
 - - INRA
 - - CEMAGREF
 - - AFOCEL
 - - VILMORIN



Response : Follow-up of certified origin plantations

- Sensing of *Pseudotsuga Menziesii* from Luzette tree seed orchard implemented in 2007 with the help of following private forest operators:
 - - Forestarn
 - - Cofogar
 - - Sud Abies

Follow-up of certified origin plantations

- - today 28 sites have been listed
- - a survey was carried out with a protocole derived from the CEMAGREF Cervidae damages observation one.



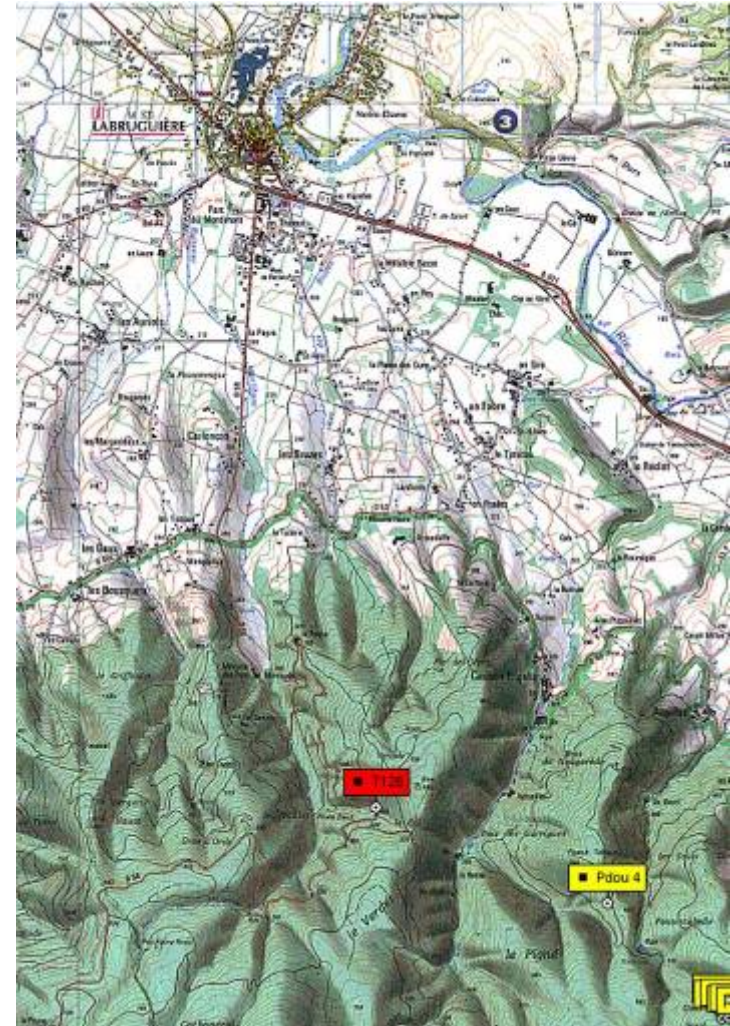
Responses: forest stocks treatment



- Treatment of stocks of *Picea* in forest during 2007 summer.
- Creation of a CRPF- forest contractors - cooperatives partnership
- After checking the opportunity of an erradicant treatment by Health Forest Department (DSF) CRPF correspondent, an eventual piles treatment was implemented.

Responses : forest stock treatment

- 5 observation campaigns were carried out with 3 weeks gaps.
- **56 000m³** were controled in 100 piles.
- 30 500 m³ didn't need intervention.
- 17 500 m³ were barked by fellers.
- only **8 000 m³** were treated.



Responses : growing contract

- A growing contract was implemented between Benoit nursery and Forestarn cooperative to produce 1-0 plants in containers with guaranty origins.



Responses: cultivation contract

- From 2008 15 000 plants of Luzette origine Luzette were planted in several members of the cooperative ownerships.



Responses:

- A CNPPF protocole comparing these different origins was also implemented in the Tarn « département » by the Forest Development Institute of the CNPPF (SUF IDF).



The future?

Cedrus

- In 2006-2007, a Fogefor (owners training) gathering 15 owners studied the interest and risks about introducing *Cedrus atlantica* to replace weathering *Picea*.



The future?

Pseudotsuga Menziesii

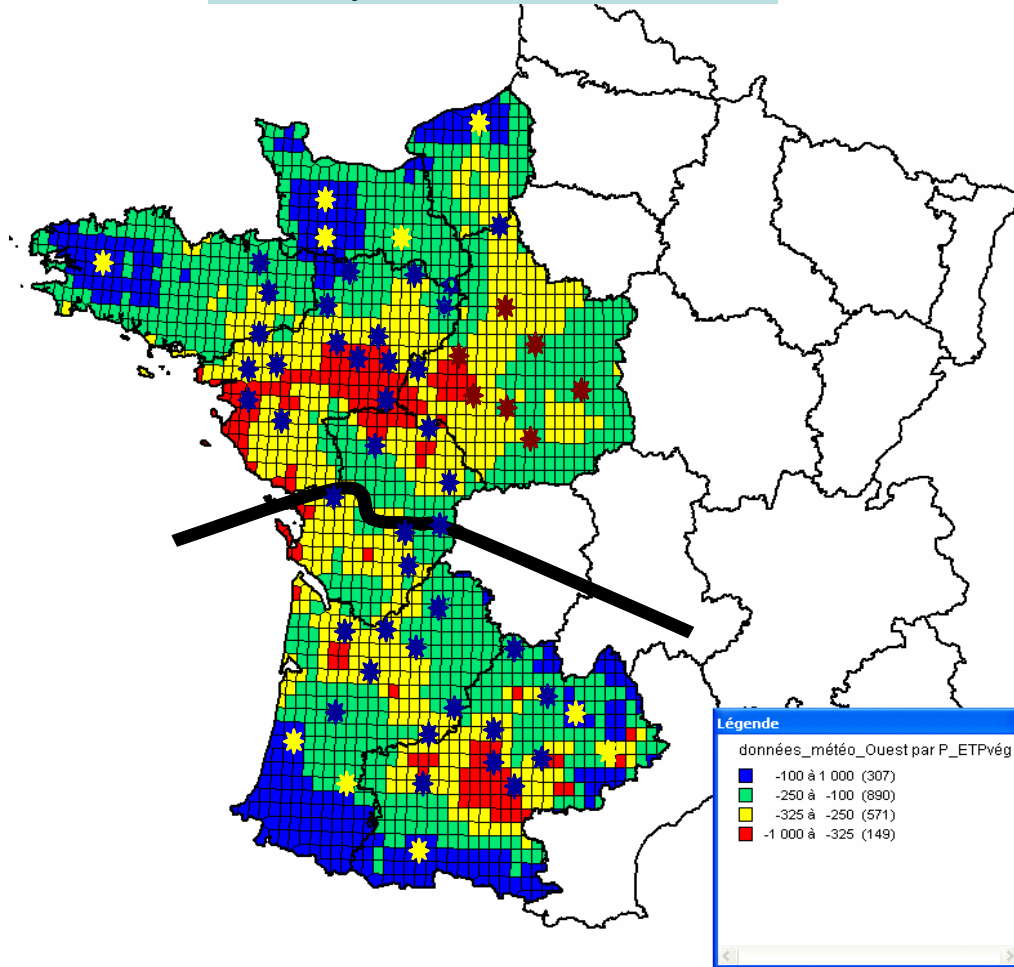
- A study about root system of this species is on the way of completion.
- Relies on existing observation network.
- Will take part in Dryade network.



And now at the regional level: *Quercus robur*!



Plots positionning project for quick inventory of module 3



For the best

Bretagne : 3 forests (2011 ?)

Normandie : 4 to 5 forests (2010)

Centre region : 7 to 8 forests if RMT

Pays de Loire : 13 forests (2010)

Poitou-Charentes : 7 to 8 forests (2010)

Aquitaine : 6 to 8 forests

Midi -Pyrénées : 12 forests (2011)

TOTAL : 52 to 57 forests

**Maximum 260 to 342
mini-plots**

And now at the regional level: *Abies alba*
Fir stand of St Croix Volvestre ?

