



Master STEP, IPGP, Paris. Frontiers in geosciences class, 21/03/2008.

CCS: Acceptability and risks



Messages

- Risks are lived with
- Acceptability is politically constructed with communities



▣ 1. CO₂ risks are lived with

- CO₂ tends to leak
 - Lighter than water
 - An acid than may react with the rock
- But
 - Natural analogues (volcanism)
 - Artificial analogues (workers ≠ public)
 - Models are improving

Volcanism: CO₂ is dangerous

- Rabaul, Papua New Guinea: In June of 1990, three people died of suffocation in a vent of the east side of Tavurvur. Three more died trying to retrieve the bodies.
- Vestmannaeyjar (Heimaey), Iceland: During the 1973 eruption a sleeping man was killed by carbon dioxide as it pooled in the basement of his house.
- Italy 1650 : eruption of Etna caused about 40 deaths; some caused by ophthalmias from sulfurous vapors and suffocation. The crew of a ship suffocated as it passed the volcano.

Lac Nyos, Cameroun: August 21st, 1986, 1700 deaths.





Artificial risks CO₂ in the workplace

- Coal mining
- Agriculture and food industry
- Fire suppression systems

Community risk: A more plausible analog of orphaned well leakage



CO2 leaks already managed





Summary: CCS risky but manageable

- People live near industrial risks
- People live near CO₂ leaks

2. The acceptance issue

- What is acceptability ?
- Psychological approach
- Sociological studies

Acceptability by whom ?

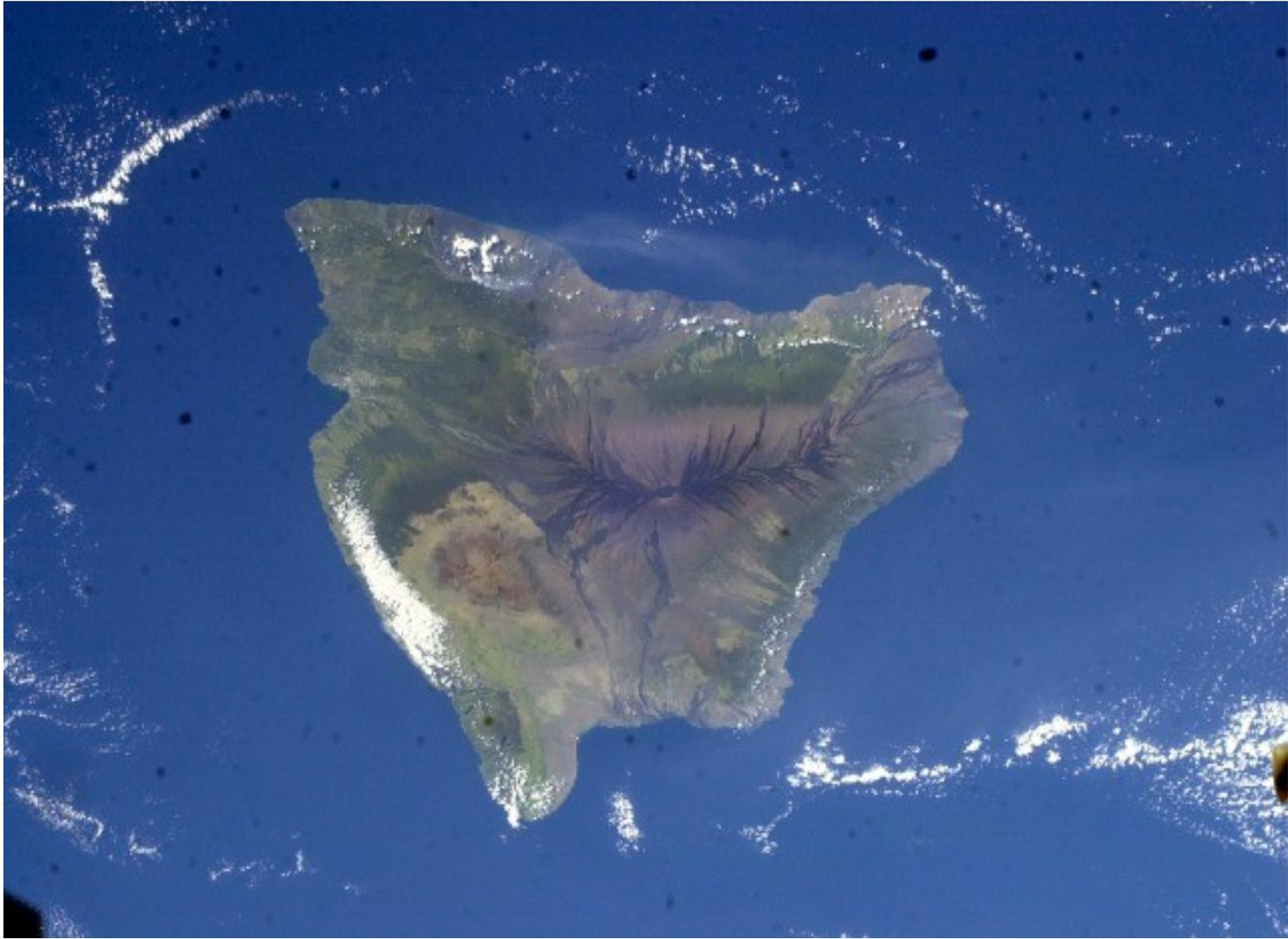
- Stakeholders:
 - Local administration
 - Central administration
 - Industry
 - Non governmental organisations
- The public at large

Acceptability of what ?

- A project: Community acceptability
- An reply to climate change:
Sociopolitical acceptability
- A technology: Market acceptability

Non-acceptance case

“Feds to Test Impact of Dumping CO₂ into Kona Waters” *West Hawaii Today*, 18/3/1999.



Regulation and acceptance in other projects

- Existing “large” projects (1MtCO₂/yr)
Sleipner, In Salah, Weyburn
- Many smaller, pilot projects today to
 - Master the technological chain
 - Engage the administrations
 - Explore local acceptance issues

Psychological risk attributes

Bad

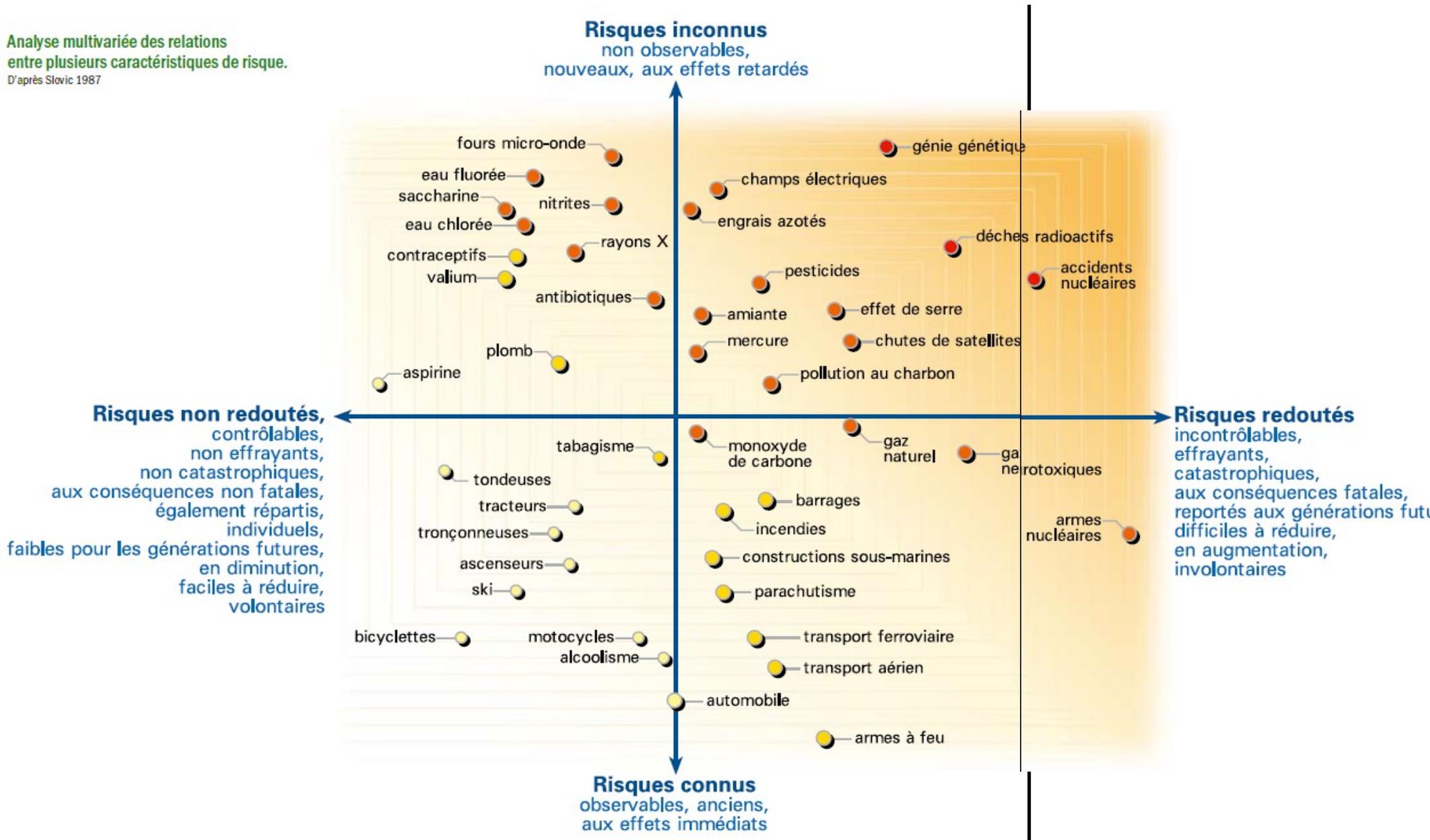
Imposed
Artificial
Catastrophic
Unknown
Memorable
Feared

Good

Just
Moral
Controlled
Familliar
Trusted actors

Perceived risk attributes: Multivariate analysis

Analyse multivariée des relations
entre plusieurs caractéristiques de risque.
D'après Slovic 1987



Lessons of sociological studies: sociopolitical acceptability

- Oceanic storage is out
- Onshore still in (France at least)
- Approval conditional on accepting the necessity of climate change action
- CCS < renewables or conservation

Lessons of sociological studies: community acceptability

- No CCS cases yet
- Lessons from windmill siting plans:

Technical approach (SIG layers)

VS.

Political approach (negociation)

Technical map vs. political map

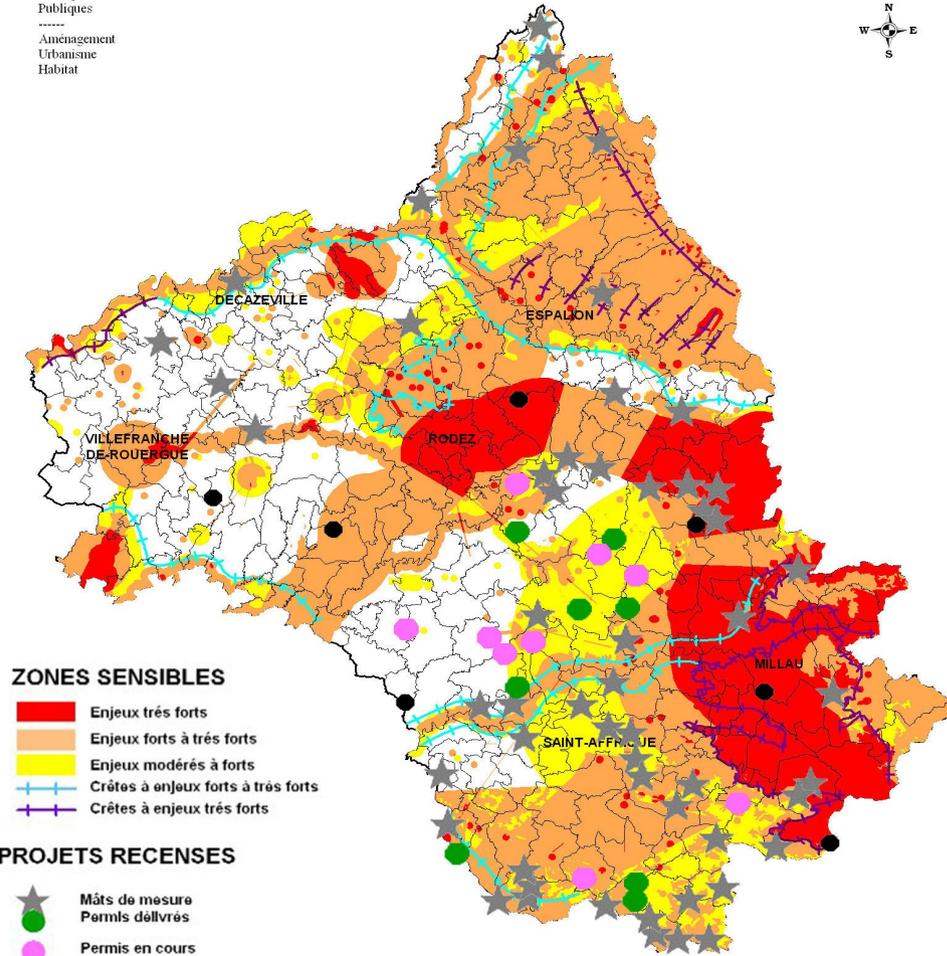


Service des
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Réflexion cadre pour le développement
de l'énergie éolienne en Aveyron

Carte de synthèse des enjeux et sensibilités en Aveyron



ZONES SENSIBLES

- Enjeux très forts
- Enjeux forts à très forts
- Enjeux modérés à forts
- Crêtes à enjeux forts à très forts
- Crêtes à enjeux très forts

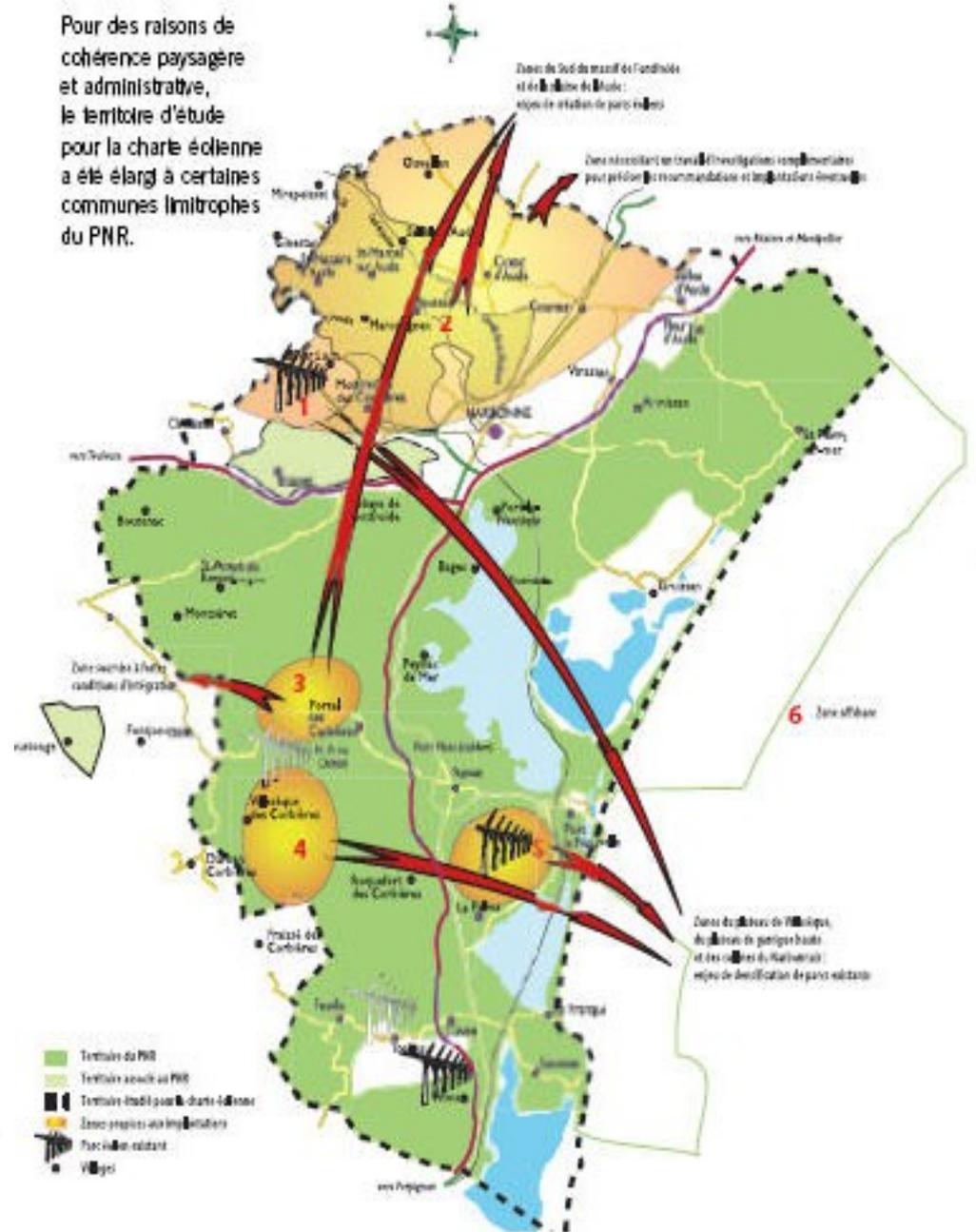
PROJETS RECENSES

- ★ Mâts de mesure
- Permis délivrés
- Permis en cours
- Permis refusés

0 7 14 28 km

REALISATION : O.Labussière
Données : DDE 12
INEA

Pour des raisons de
cohérence paysagère
et administrative,
le territoire d'étude
pour la charte éolienne
a été élargi à certaines
communes limitrophes
du PNR.



- Territoire du PNR
- Territoire associé au PNR
- Territoire étudié pour la charte éolienne
- Zones proches des habitations
- Parcelles existantes
- Villages

Conclusions

- CCS risks seem more manageable than many other risks: climate change, nanotech, GMOs
- Sociopolitical and local acceptability remain to be co-constructed