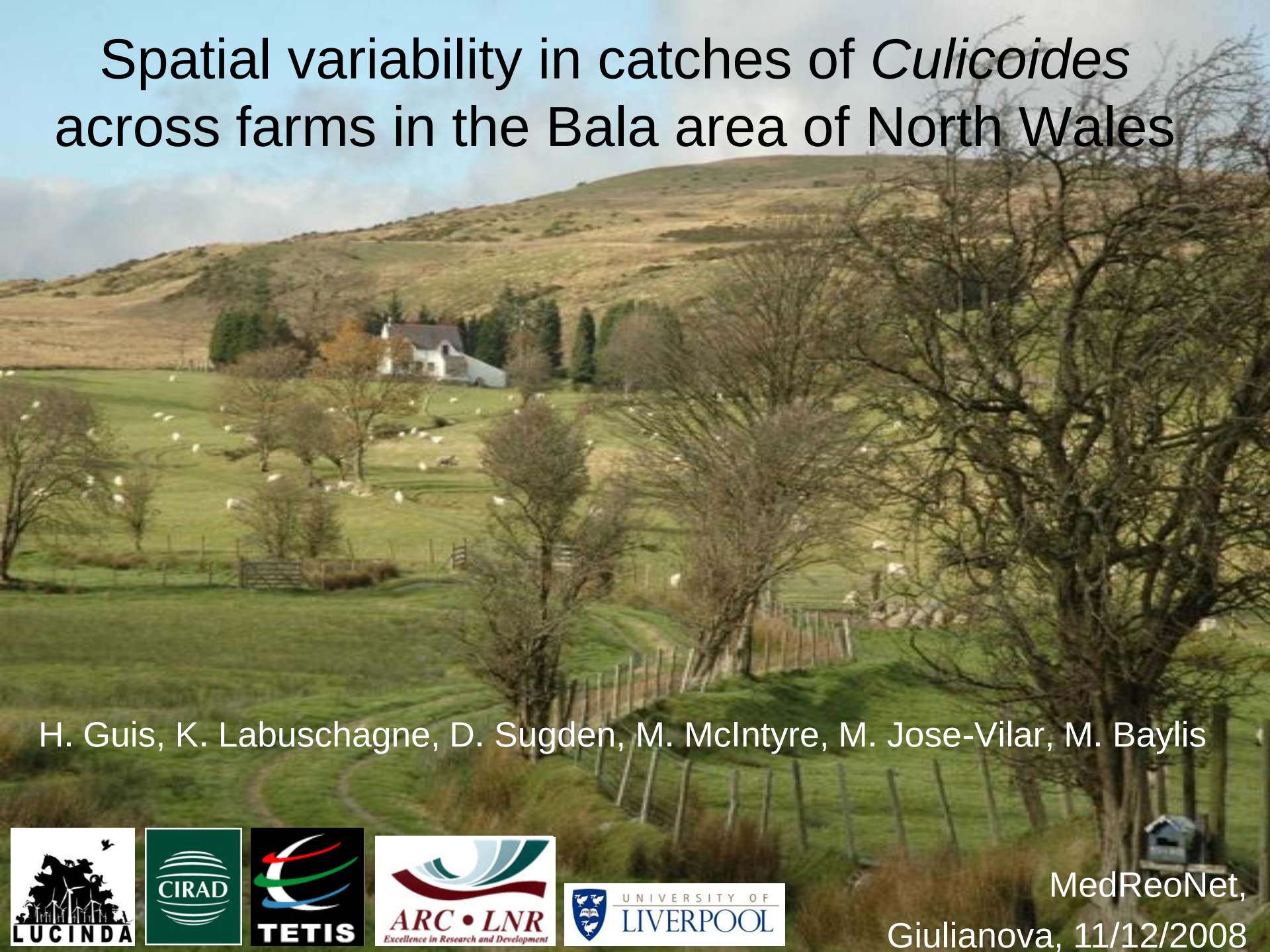
Spatial variability in catches of *Culicoides* across farms in the Bala area of North Wales



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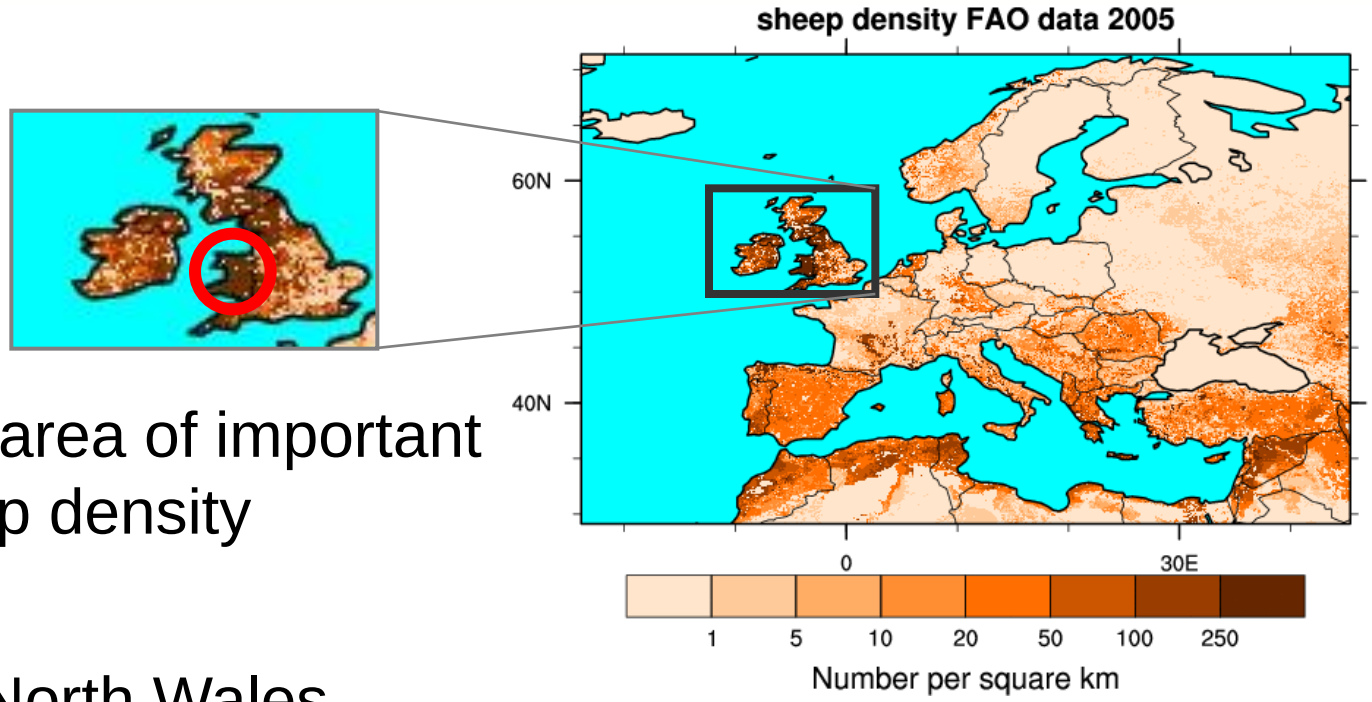
MedReoNet,
Giulianova, 11/12/2008

Background and aim

- First BT outbreaks in the UK in September 2007
- Wales: important area of sheep production
- Modelling spatial distribution of vectors
  - Scale
  - Trap abundance

- Better understanding of spatial distribution of midge densities at a local scale:
  - Variability between farms
  - Environmental factors
  - Influence of neighbouring farms (spatial autocorrelation)

Study area: Bala in North Wales



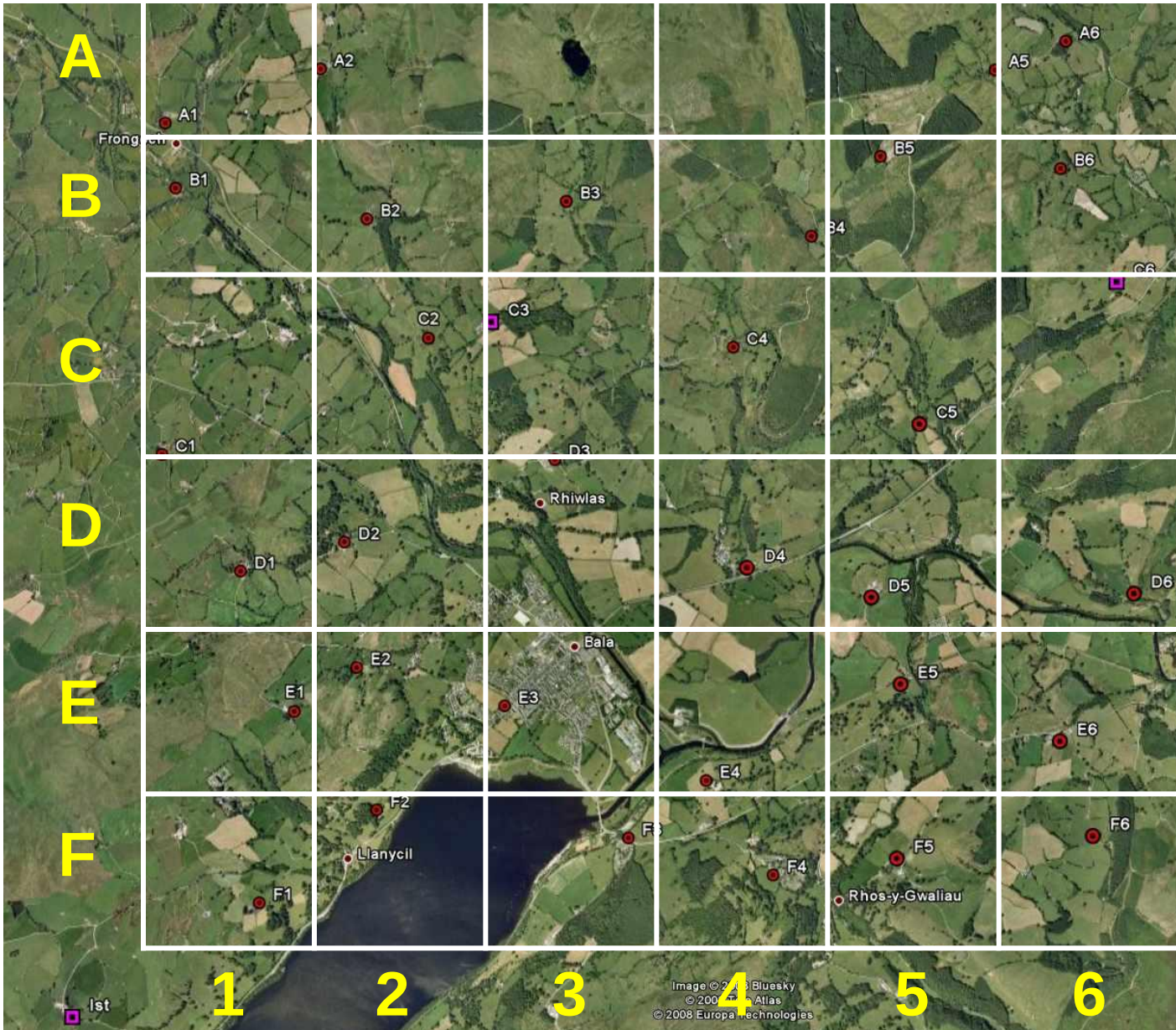
Wales: area of important sheep density

Bala: North Wales

Study design (1)

- 6x6 km grid
- Thrice replicated randomised sampling
- 12 nights (July 2008)
- 35 sites:
  - 3 replicates in 32 sites
  - 12 replicates in 3 sites (permanent)

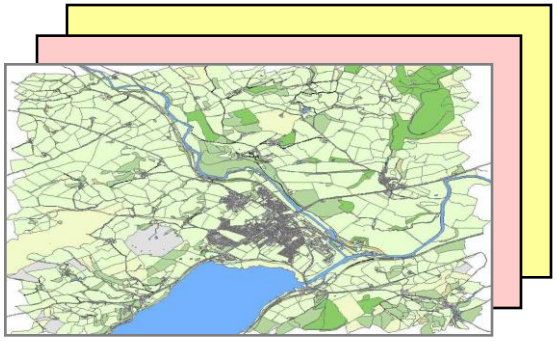
(n = 132 catches)



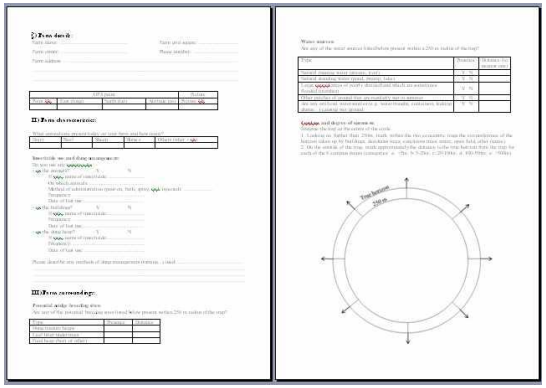
Study design (2)

- Entomological data:
  - OVI traps (mains or tractor battery + converter)
  - *Culicoides* species sorted by K. Labuschagne

- Environmental data:
  - Land-cover and land-use
  - Altitude
  - Soil
  - Weather (ground stations)



- Questionnaires:
  - Farm characteristics
  - Insecticide use
  - Dung management
  - Water sources
  - Proximity to potential breeding sites (dung, leaf, food heap…)
  - Openness of the landscape



Preliminary results (1)

- Rough data :
  - Total: 357 229 *Culicoides* (mean 2 706 per trap per night), 19 species

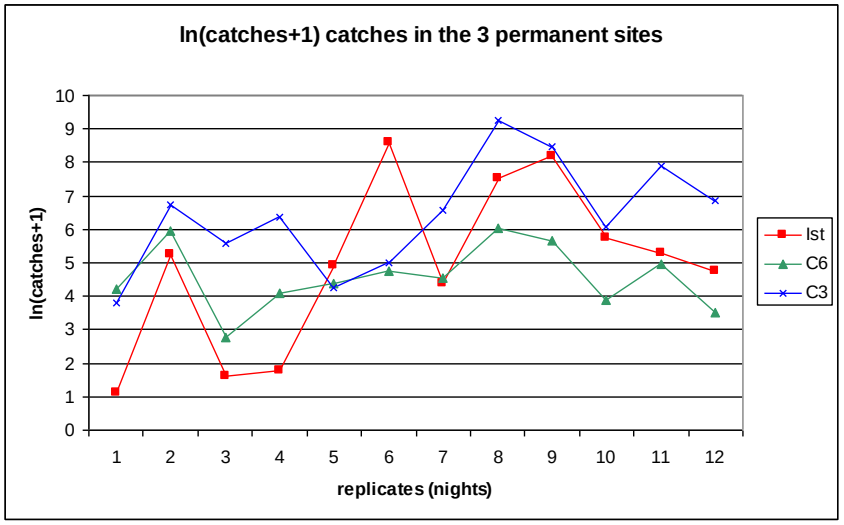
Species	Number	%
Obsoletus group	221 173	62
punctatus	54 857	15,4
impunctatus	51 455	14,4
achrayi	19 569	5,5
pulicaris	6 566	1,8
albicans	1 481	0,4
fasciipennis	1 305	0,4
deltus	403	0,1
festivipennis	194	0,1
nubeculosis	106	<0,1
kibunensis	85	<0,1
brunnicans	23	<0,1
pictipennis	9	<0,1
circumscriptus	5	<0,1
minimus	1	<0,1
stigma	1	<0,1

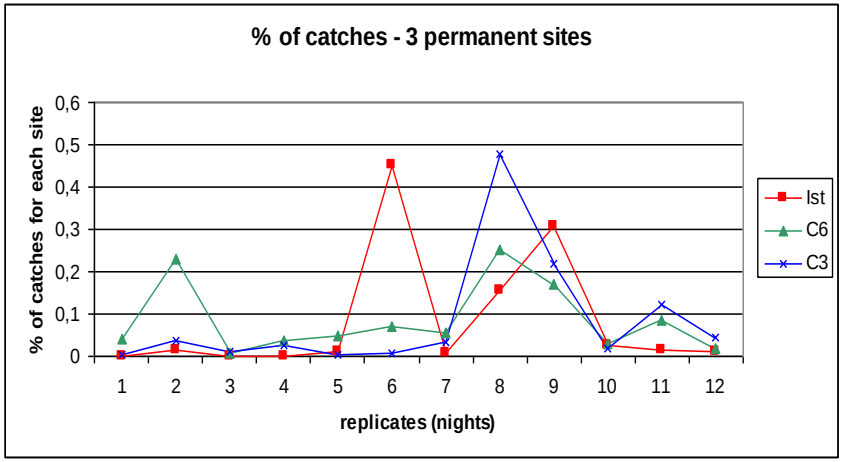
Species	Number	%
Obsoletus group	211 927	59,3
obsoletus ss (male)	6576	1,8
scoticus (male)	962	0,3
dewulfi (male)	1694	0,5
chiopterus (male)	14	0,0
total	221 173	62

Preliminary results (2)

- 3 “permanent” sites (12 replicates):

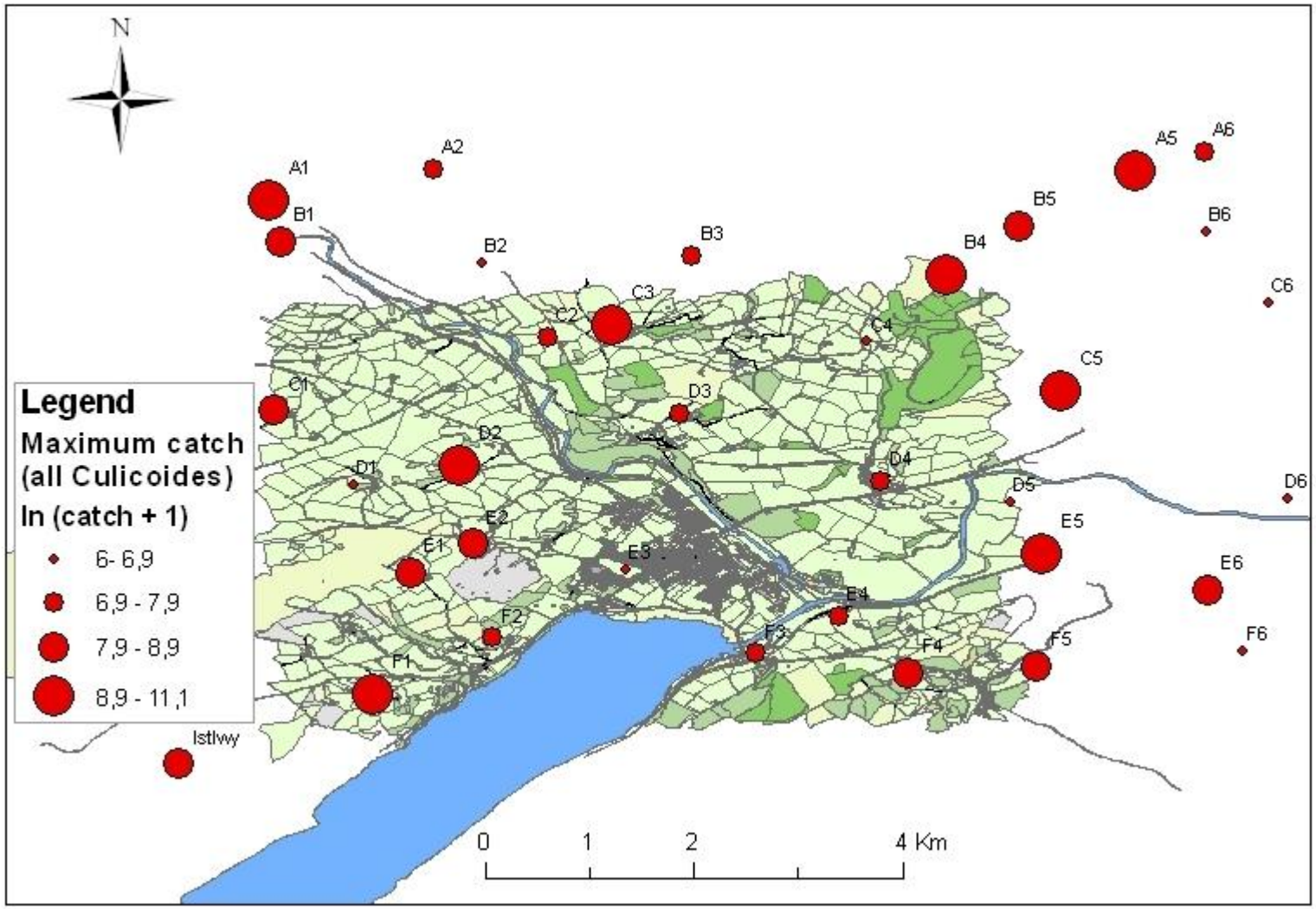
to account for climatic effects (night)





Preliminary results (3)

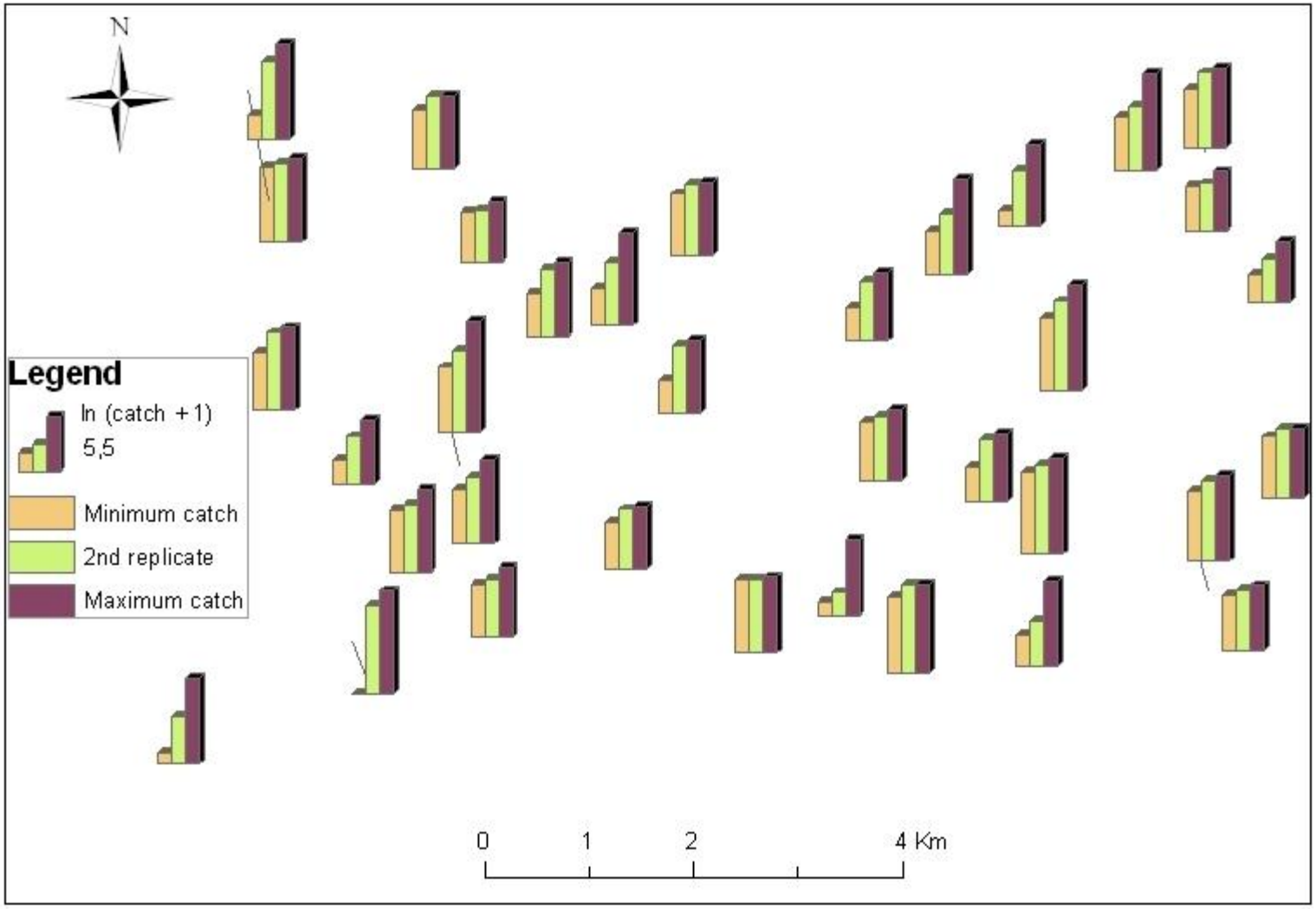
- Maximum catches *(Culicoides)*



Preliminary results (4)

- Variation:

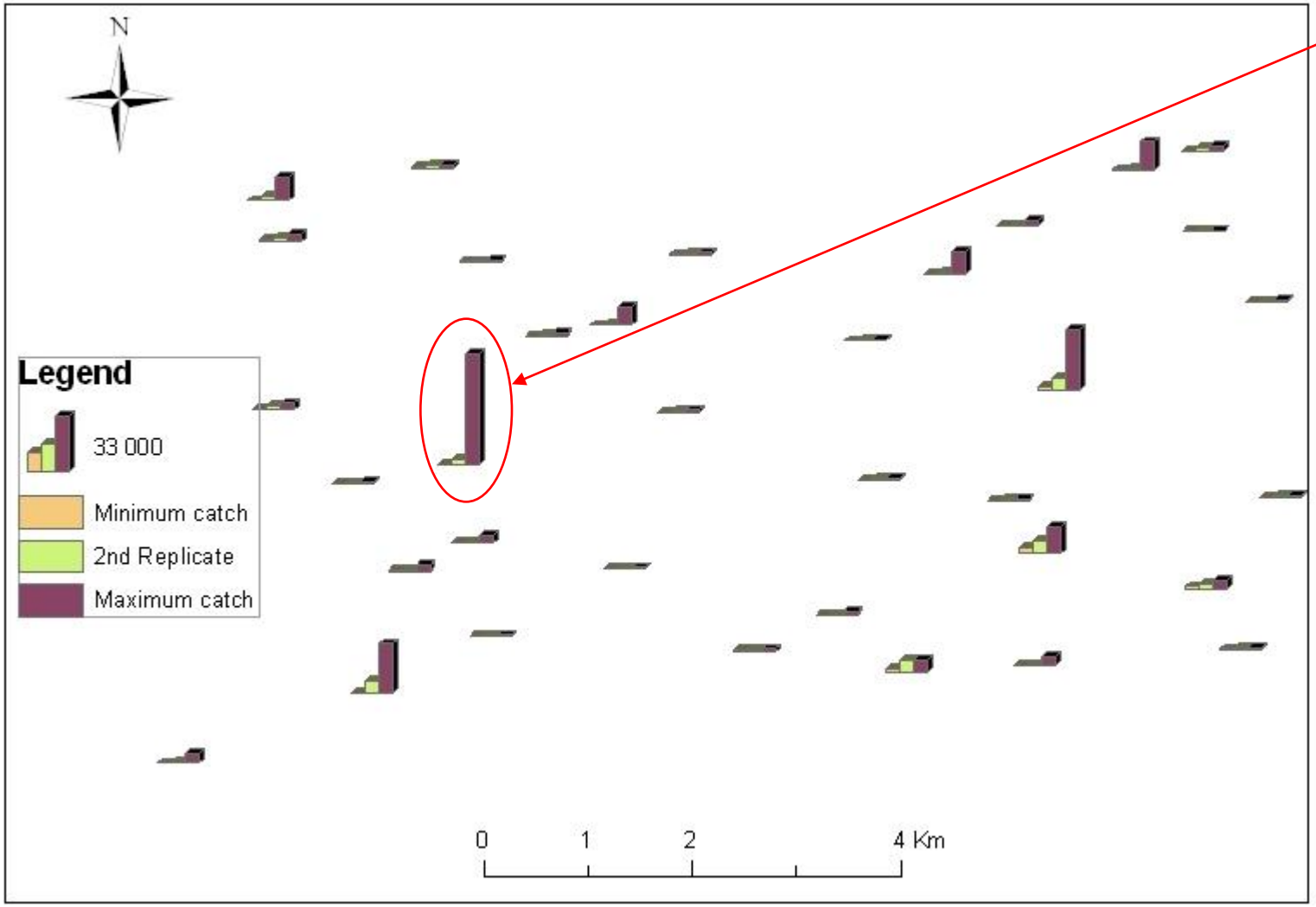
Min – 2nd replicate - Max catches *(Culicoides); log transformed*



Preliminary results (5)

- Variation

Min – 2nd replicate - Max catches *(Culicoides)*



D2

Min = 694

Max = 65 763

To do…

- For the different *Culicoides* species
- Assess variability (dispersal = var? cv?...) and spatial autocorrelation
- Understand spatial distribution
  - environmental factors
  - farms characteristics
- How can we model and map vector abundance??


Thank you for your attention