

Modelled consequences of climate change on fodder production in selected milk-exporting countries



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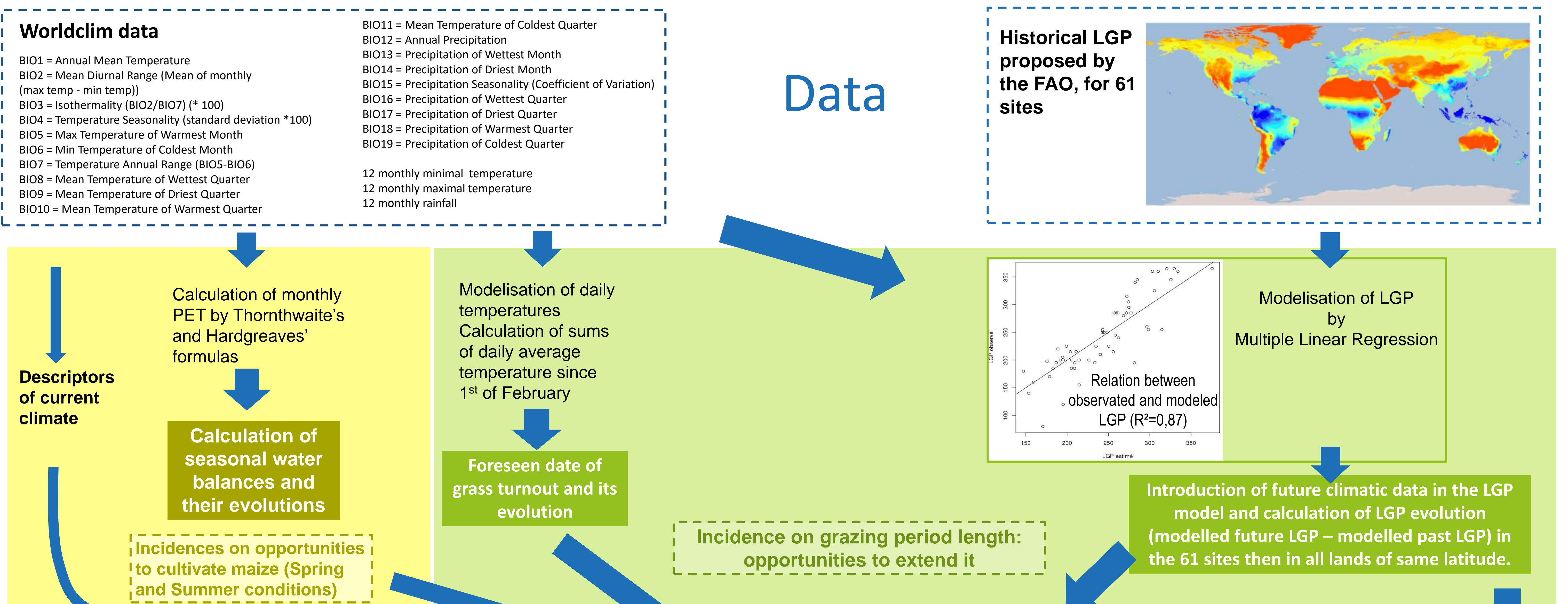
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CNIEL, The French dairy interbranch organization, is currently funding a study named "Climalait" with an international focus, exploring the possible evolution of the climatic conditions in areas active in the world dairy market. This prospective study is based on the WorldClim data from the CNRM (RCP 8.5) and the LGP (Length Growing Period) proposed by the FAO. Several agricultural and climatic indicators were calculated for these areas, both on past periods (1950-2000) and for the future (2041-2060). The evolution of the LGP is estimated by a statistical model based on WorldClim data. Evolutions of the various indicators and of the LGP put areas with similar potential climatic futures regarding forage production to the fore.



Results

Figure 1: Cluster analysis for 34 sites in Europe, based on evolutions of LGP and seasonal temperatures, precipitations and PET.

		estimated LGP 2041-2060 - estimated LGP 1950-2000 (Days)	Sooner turnout to grass (days)	Future (2041-2060) Spring water balance - Past (1950-2000) Spring water balance	Future (2041-2060) Summer water balance - Past (1950-2000) Summer water balance	Consequences on maize silage	Consequences on grass land
1	RUS Tatarstan						
2	RUS Bachkirie						
3	RUS Krasnodarsky Kraï	14	15	-21 mm	-30 mm	--	+
4	RUS oblast de Rostov						
5	DEU Bavière	18	21	23 mm	10 mm	++	++
6	UKR Nijyn						
7	UKR Khmel'nitsky	18	16	2 mm	-29 mm	=	++
8	BLR Minsk						
9	POL Poznan						
10	UKR Lviv						
11	LTU Siauliai						
12	POL Mazovie	16	19	25 mm	6 mm	+ or ++	++
13	POL Poldachie						
14	BLR Brest						
15	SWE Kalmar						
16	DEU Nord Rhénanie						
17	DEU Saxe						
18	SWE Götaland	15	22	6 mm	10 mm	+	++
19	DEU Basse Saxe						
20	DNK Sud						
21	FRA Léon	4	5	2 mm	-19 mm	=	=
22	FRA Doubs						
23	FRA Monts du Lyonnais	14	22	17 mm	-6 mm	= or -	++
24	FRA Haut Vivarais						
25	FRA Saintonge						
26	FRA Mauges						
27	FRA Confolentais						
28	FRA Béarn						
29	FRA Périgord						
30	FRA Tarn	7	6	-3 mm	-27 mm	- or --	= or +
31	FRA Bocage cotentin						
32	FRA Pays de Caux						
33	FRA Thiérache						
34	FRA Plateau Lorrain						

Conclusion

According to RCP 8.5 and the CNRM climatic model, large lowlands of Central Europe, from Rhine to Dniepr basin, seem to benefit from climate change with better prospects for grass and silage maize cultivation and growth. As a result a synergy exists between milk production development dynamics and climate evolution. With summer water balance getting worse, evolution seems to be less favourable in Western and South-Western France.

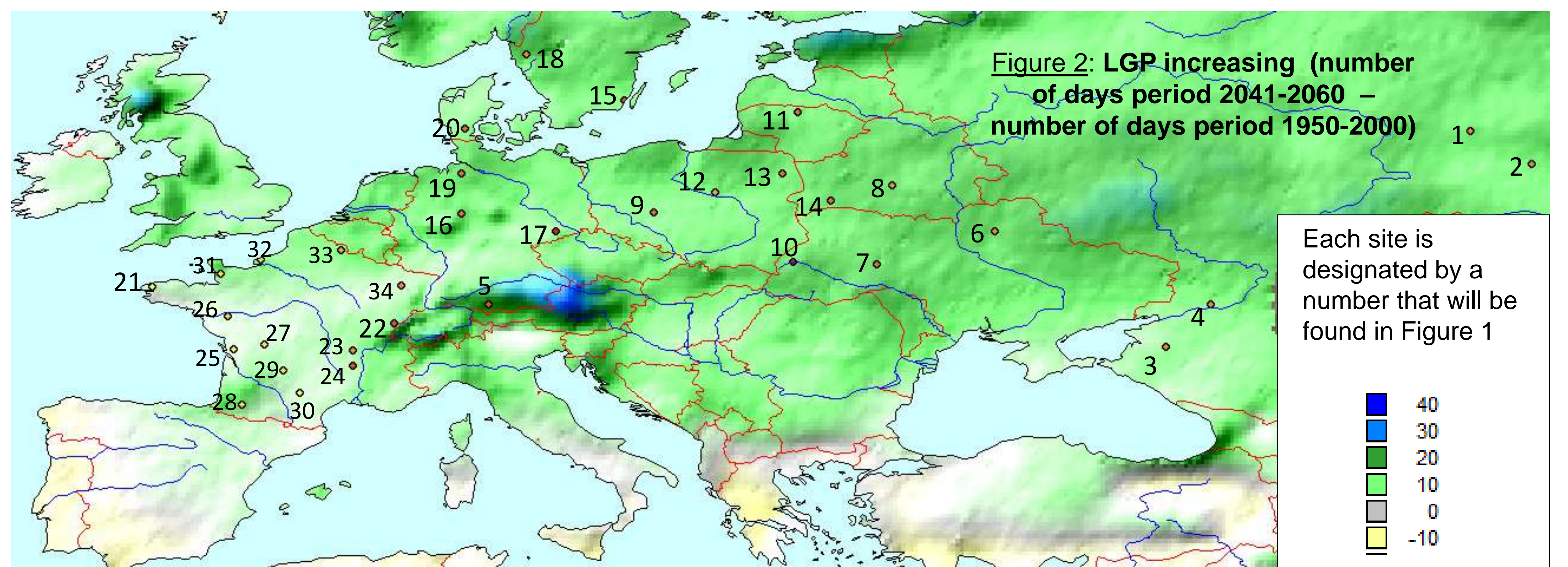
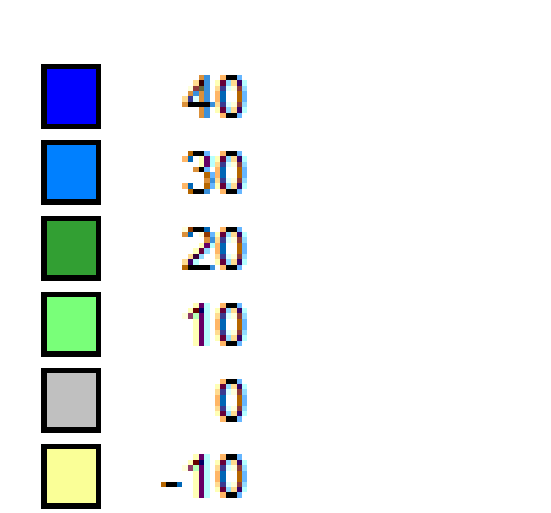


Figure 2: LGP increasing (number of days period 2041-2060 - number of days period 1950-2000)

Each site is designated by a number that will be found in Figure 1



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