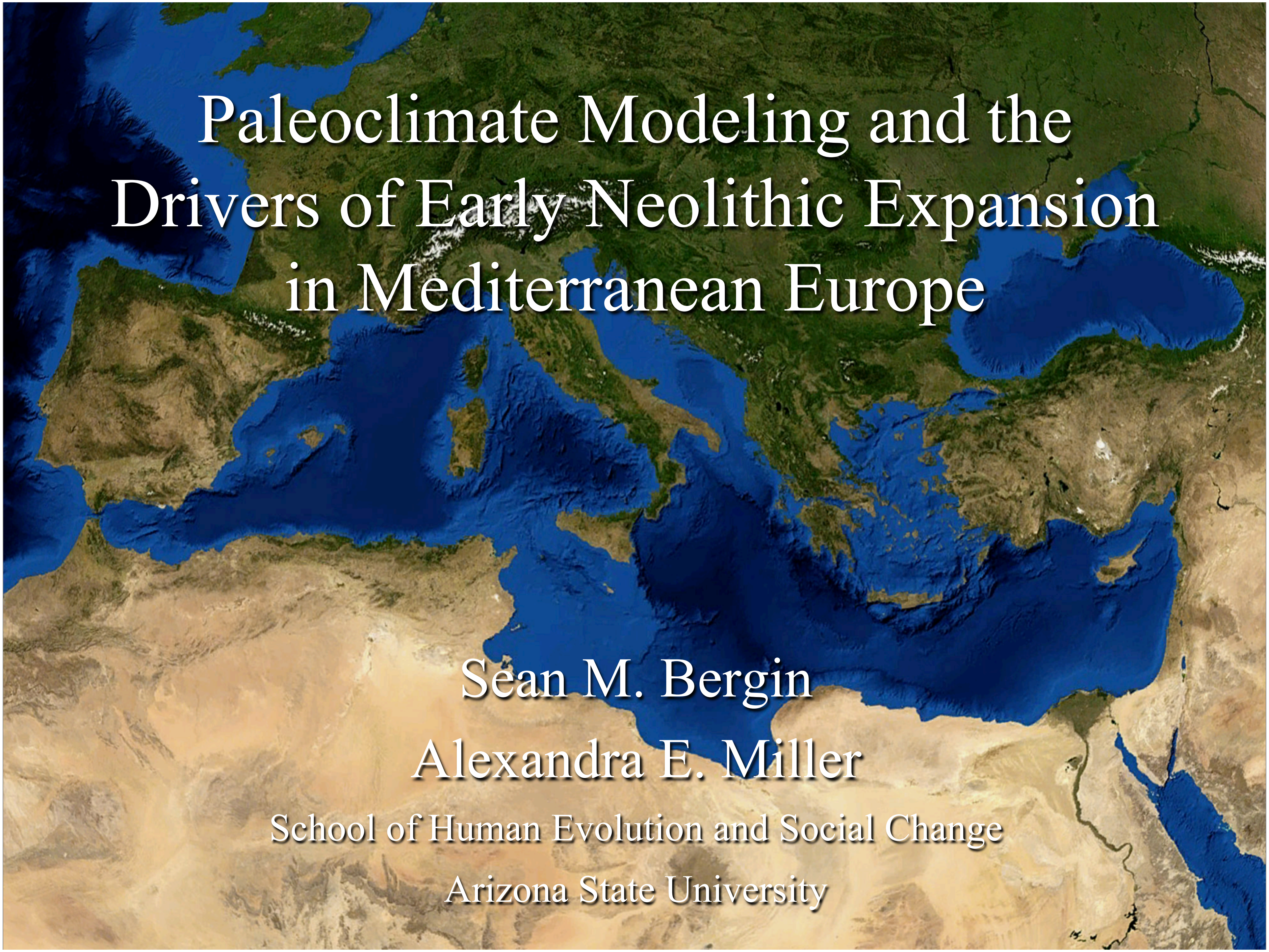

Paleoclimate Modeling and the Drivers of Early Neolithic Expansion in Mediterranean Europe

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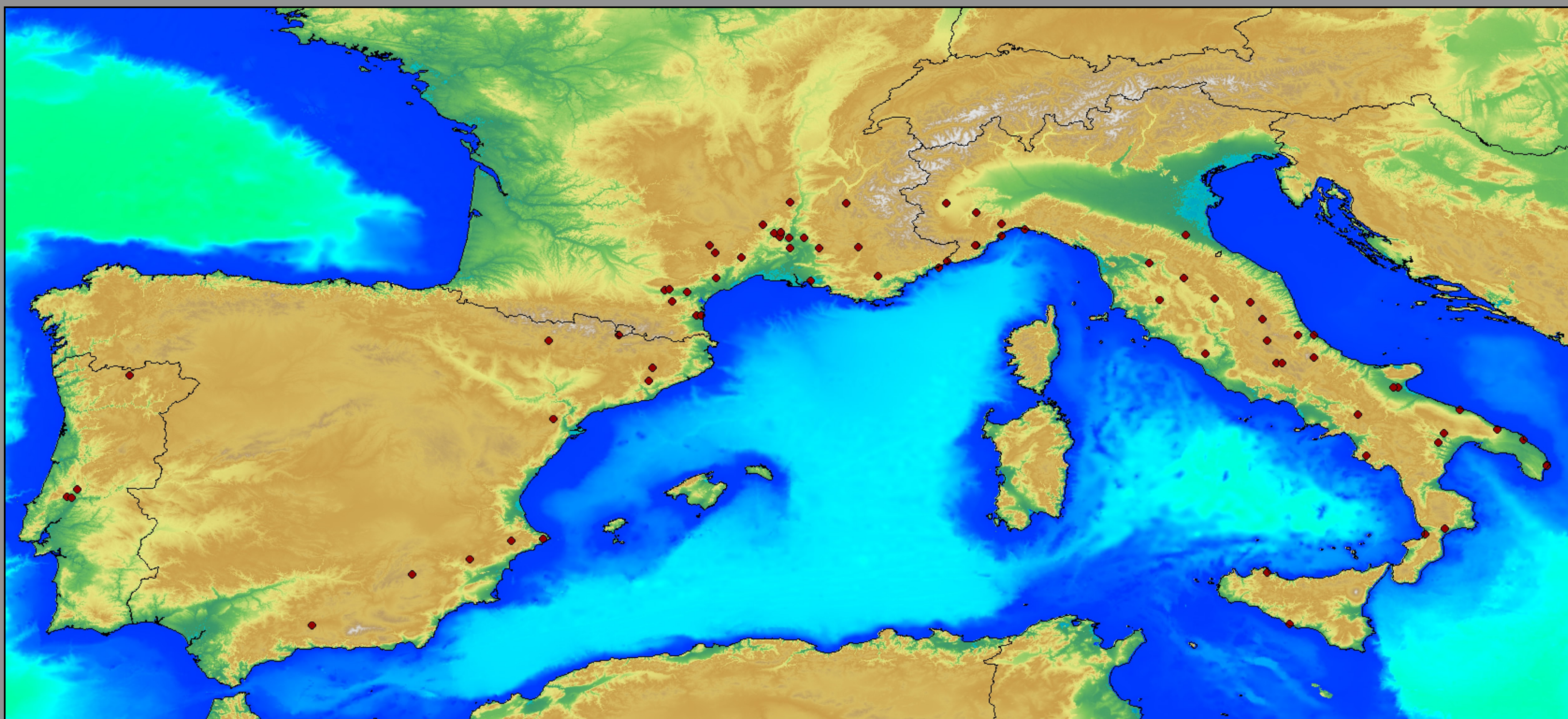
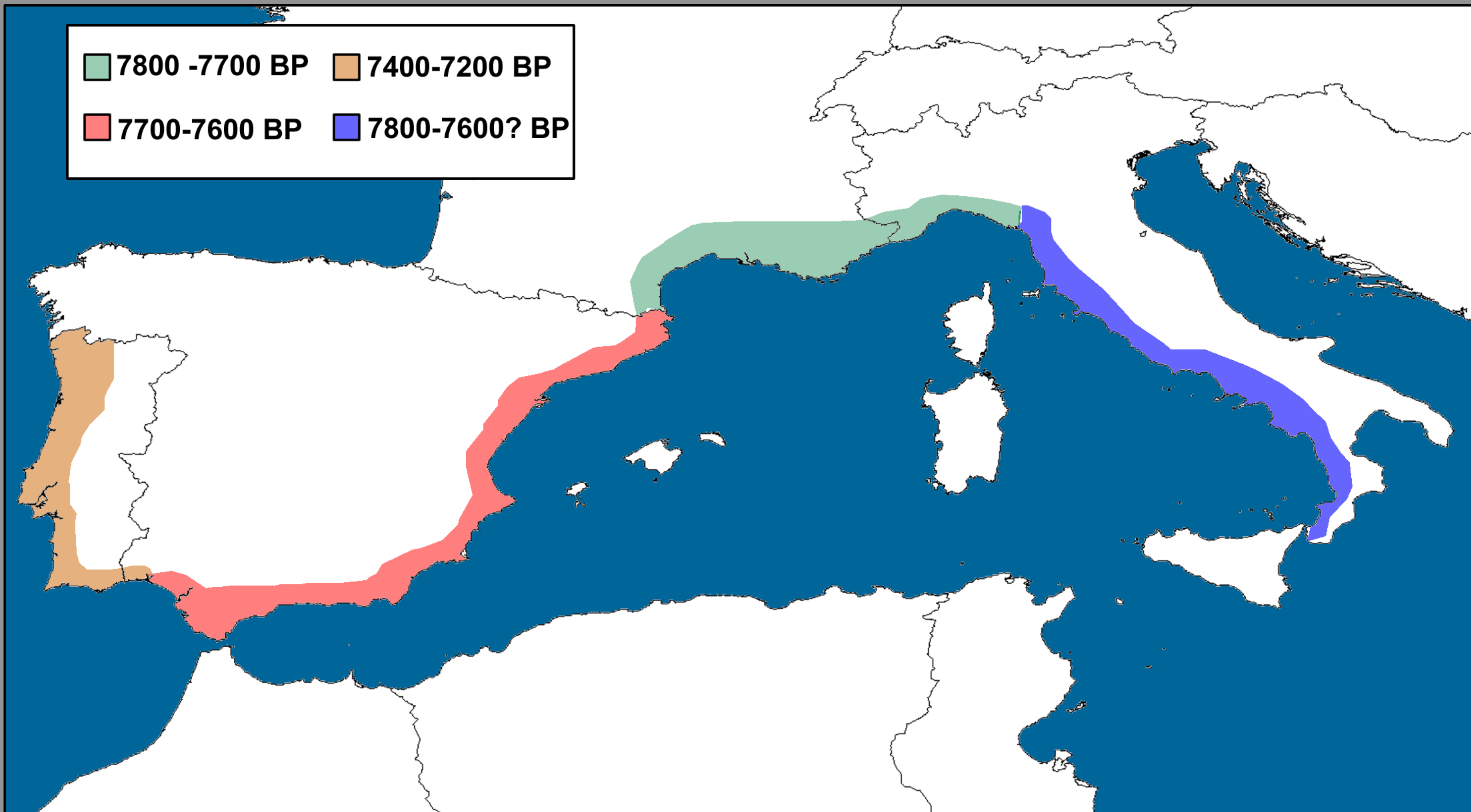
The Early Neolithic in the West Mediterranean




7800 -7700 BP
7400-7200 BP
7700-7600 BP
7800-7600? BP

Human Behavioral Responses to Environmental Stimuli

- Periods of subsistence instability, likely correlate with periods of climatic instability and variability.

- Extremely variable climatic conditions would inhibit the success of early neolithic settlement, especially in new areas.

- Hunter-gatherers are more likely to adopt new resources in times of resource stability.

Climate Modeling

Nice, France Precipitation

Scroll right for output graph -->

Warning: Pressing Enter after changing the control variables will automatically change the regression

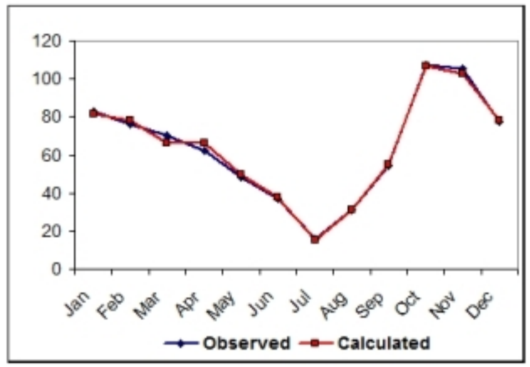
	Fcn (Jet)	Fcn (High)	Fcn (CYHX)
	2	1.5	1
	39.5	41.2	33.9

Month	PPT CR	Jet0	EUHX	CYHX	Fcn (Jet)	Fcn (High)	Fcn (CYHX)
Jan	4.35615928	26	32.3784215	26.36	1.27711E-10	3.08729E-08	4.51681E-13
Feb	4.24194598	30	28.4670158	30	1.26071E-05	2.25403E-16	0.000497955
Mar	4.13166697	30	29.68469909	34.1	1.26071E-05	1.59434E-13	0.980198673
Apr	3.96421044	30	35.44317064	33.85	1.26071E-05	0.000633225	0.998750781
May	3.6509418	33	38.11763402	36	0.005086069	0.121076961	0.110250525
Jun	3.32907339	40	40.51272163	36.58	0.969233234	0.900354223	0.027565232
Jul	2.52162771	39.5	45.01372439	37.89	1	0.039474132	0.000349136
Aug	3.15591396	41	45.22148877	37.37	0.754839602	0.027491994	0.002428576
Sep	3.79056963	40	44.22085052	33	0.969233234	0.131611971	0.666976811
Oct	4.75722452	33	42.24482379	32.56	0.005086069	0.784592824	0.407465098
Nov	4.72586922	33	39.77867053	31.54	0.005086069	0.638311847	0.061741436
Dec	4.2610013	29	37.41842162	28.84	1.03485E-06	0.041675068	2.75581E-06
What		Jet	High	ITC	Function Jet	Function High	Function CYHX

Raw Regression Results

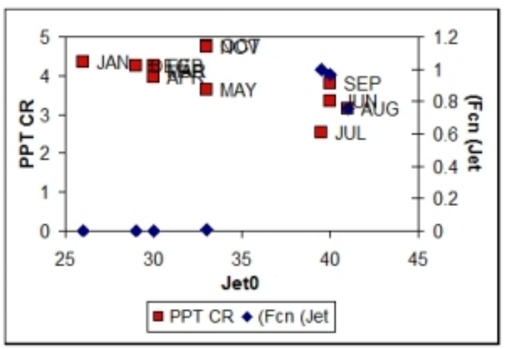
0.48146014	0.57012681	-1.5669631	-0.168225	-0.009265	0.12996734	5.68697521
0.05443301	0.06678989	0.12279195	0.01063282	0.00629346	0.01689565	0.30304877
0.99554706	0.06526581					
186.308818	5					
4.76163568	0.02129813					

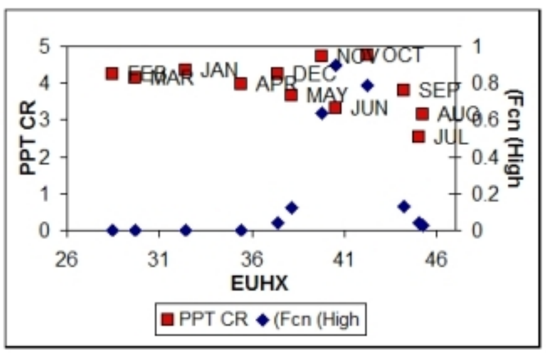
These values will update automatically if the input data is

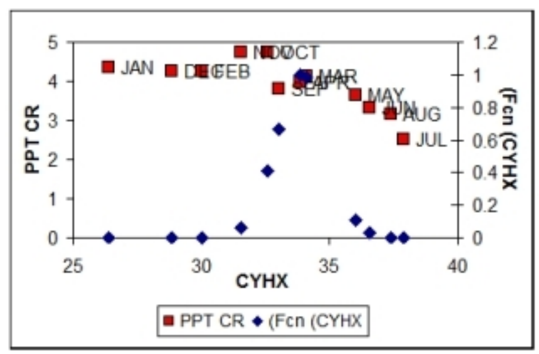


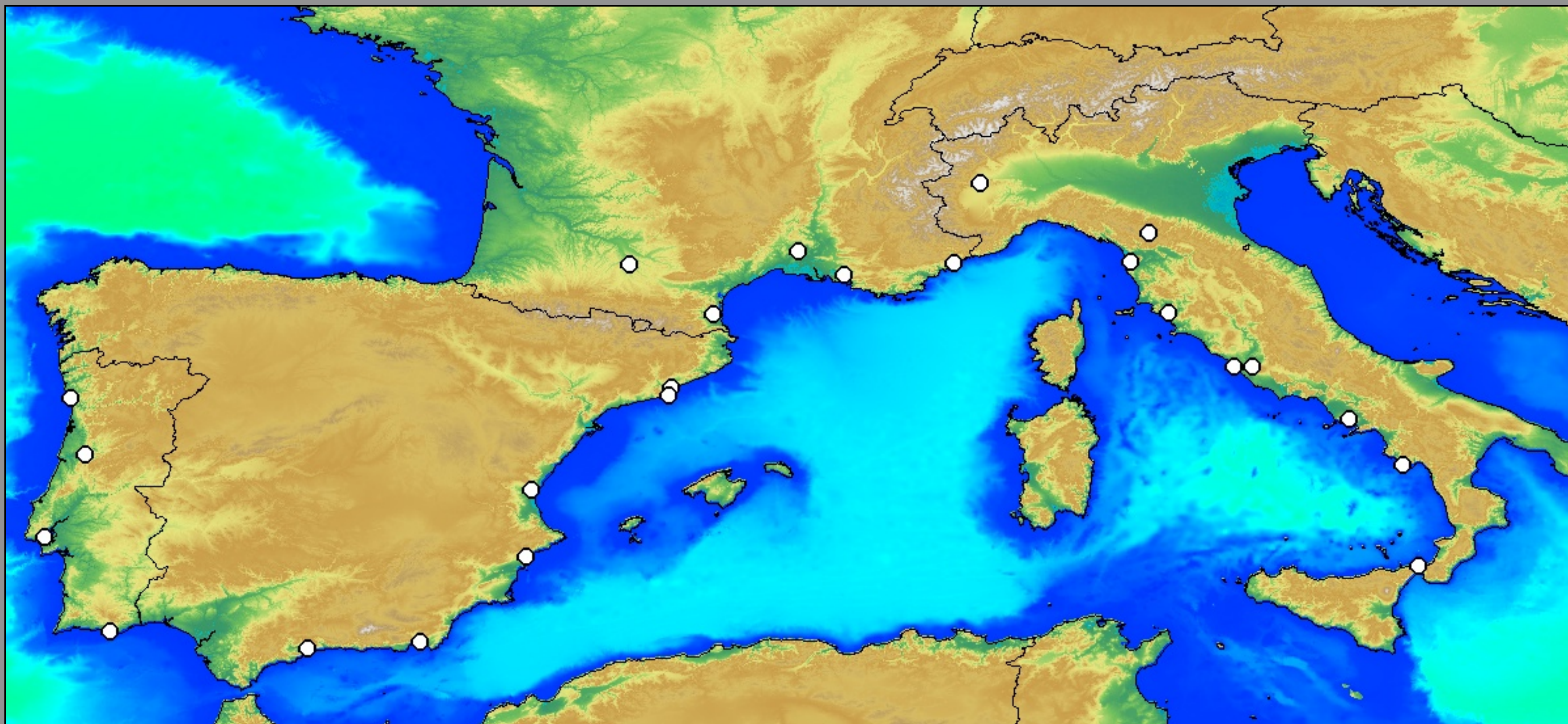
Precipitation Regression Output

Constant		5.6869752				
Std Err of Y Est.		0.0652658				
R Squared		0.9955471				
No. of Observations		12				
Degrees of Freedom		5				
	Jet0	EUHX	CYHX	Fcn (Jet)	Fcn (High)	Fcn (CYHX)
X Coefficient(s)	0.1299673	-0.009265	-0.168225	-1.566963	0.57012681	0.4814601
Std Err of Coef.	0.0168956	0.0062935	0.0106328	0.122792	0.06678989	0.054433
			Control	2	1.5	1
			Variables	39.5	41.2	33.9

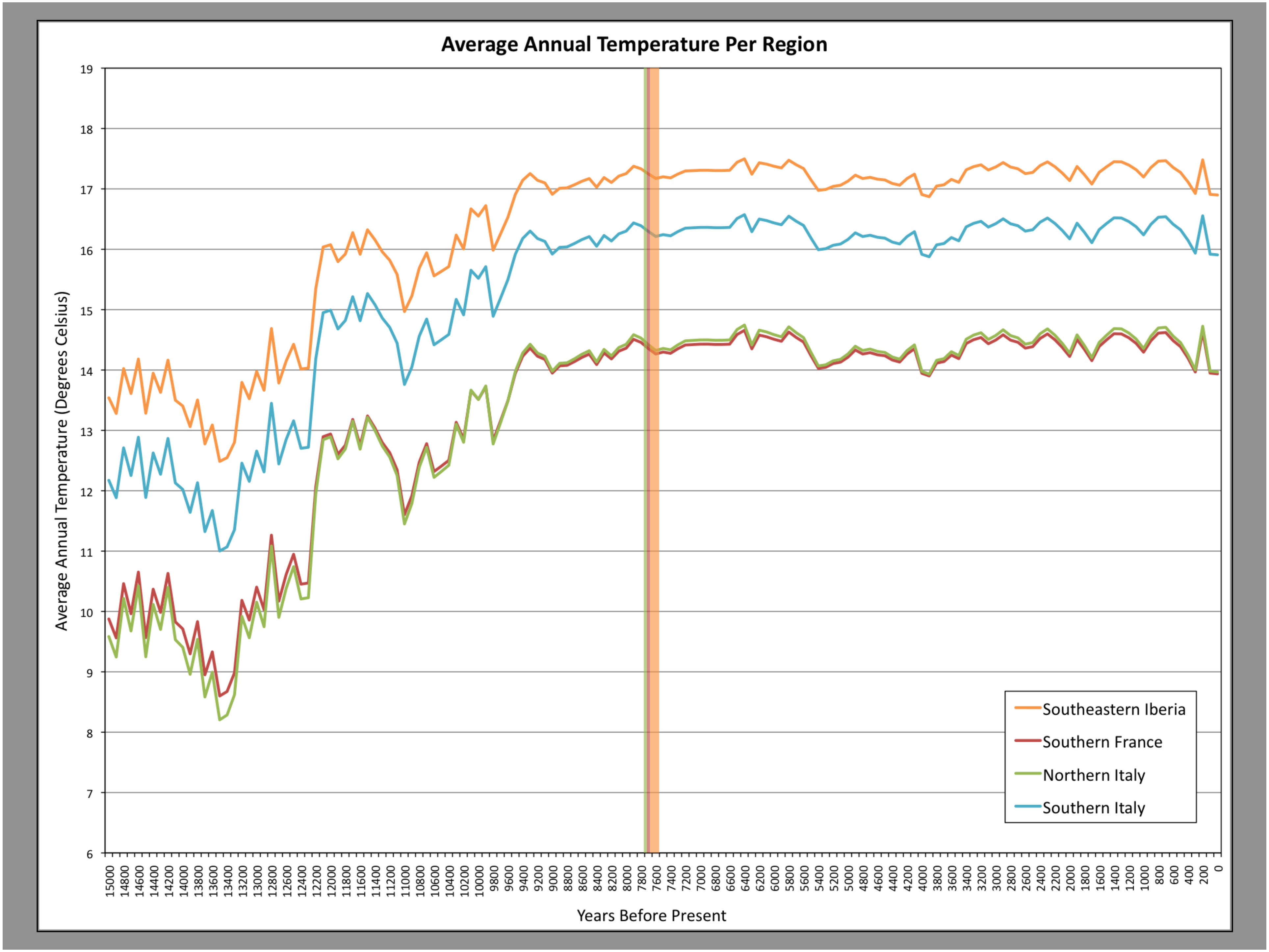


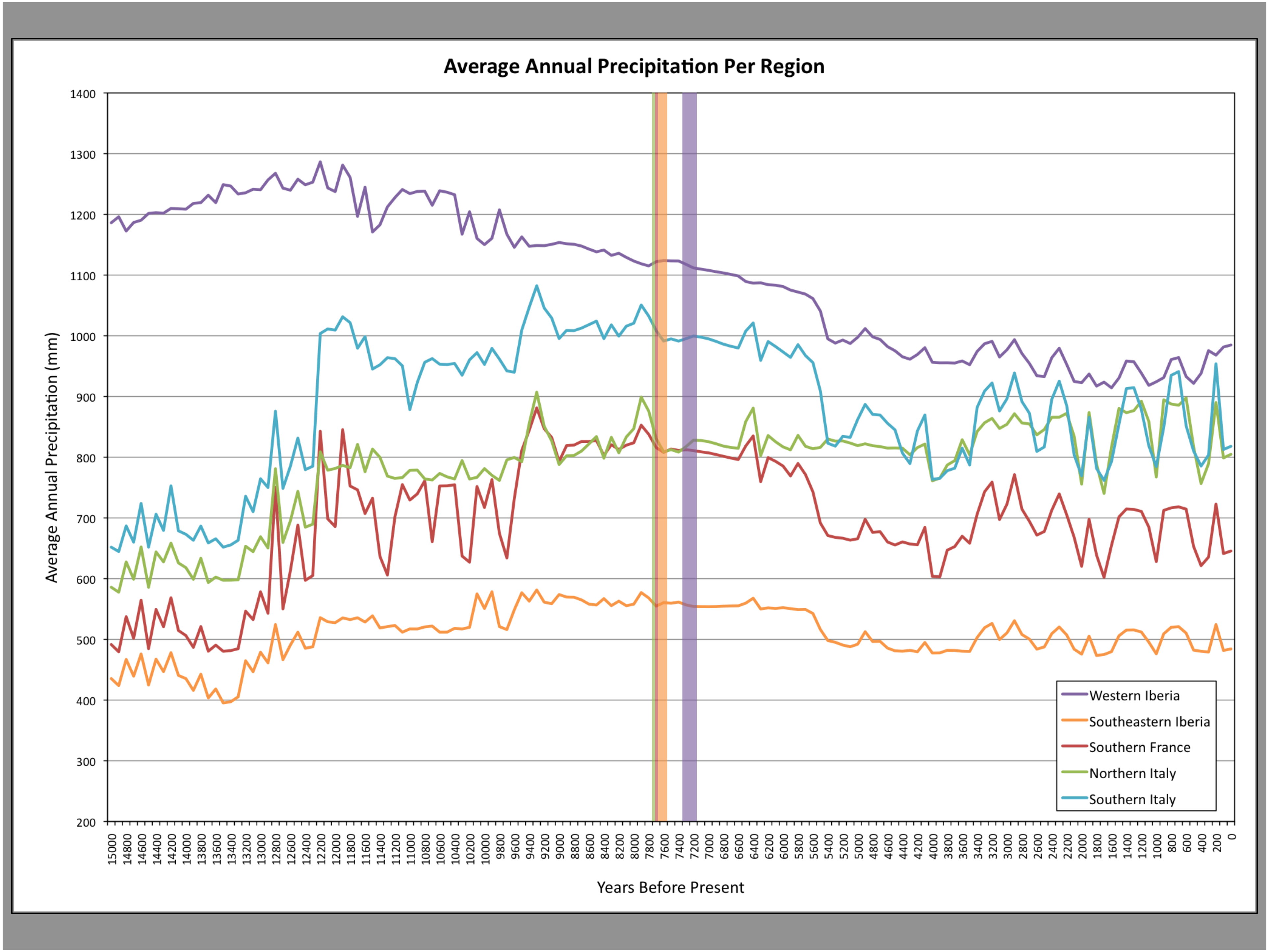




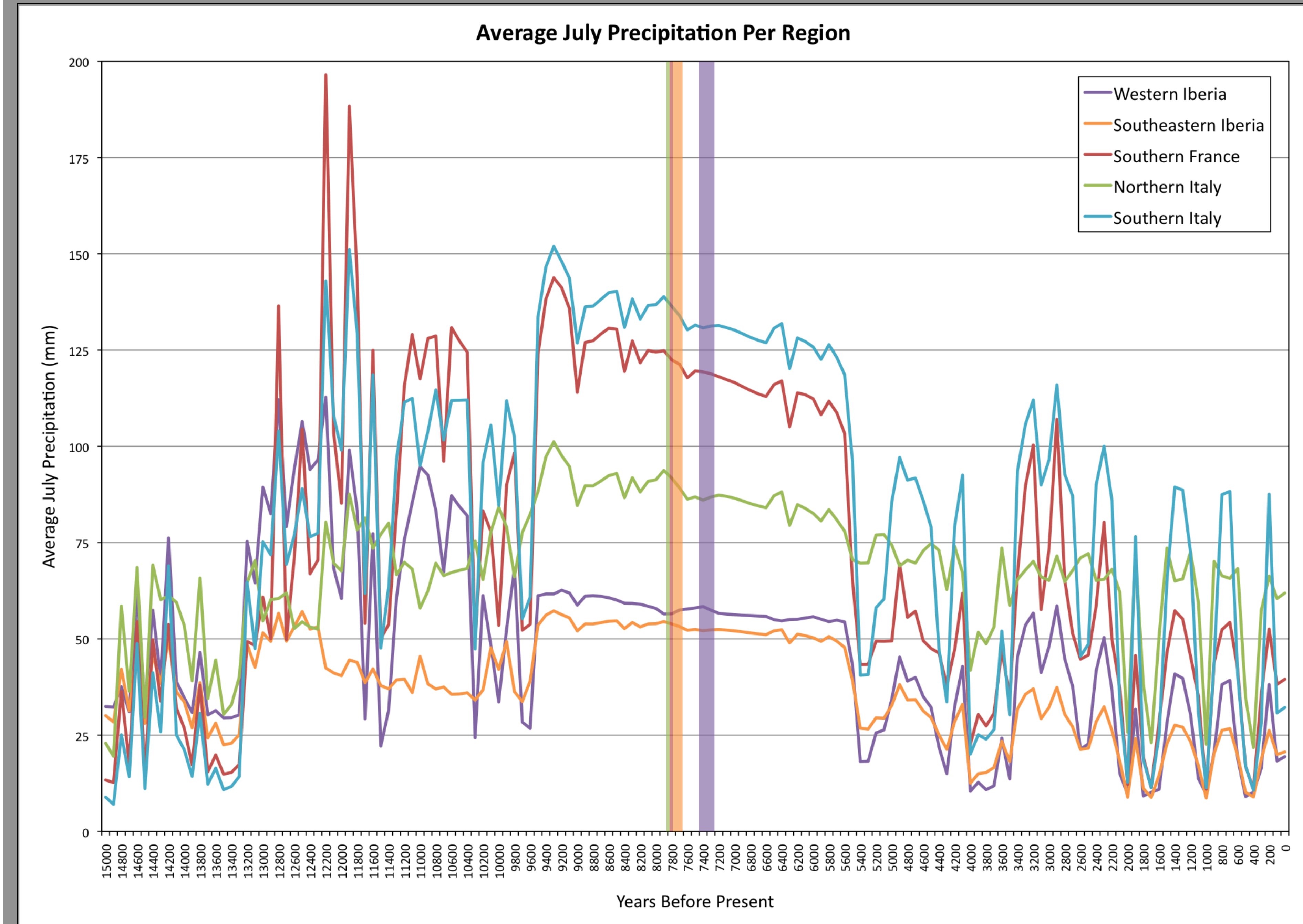


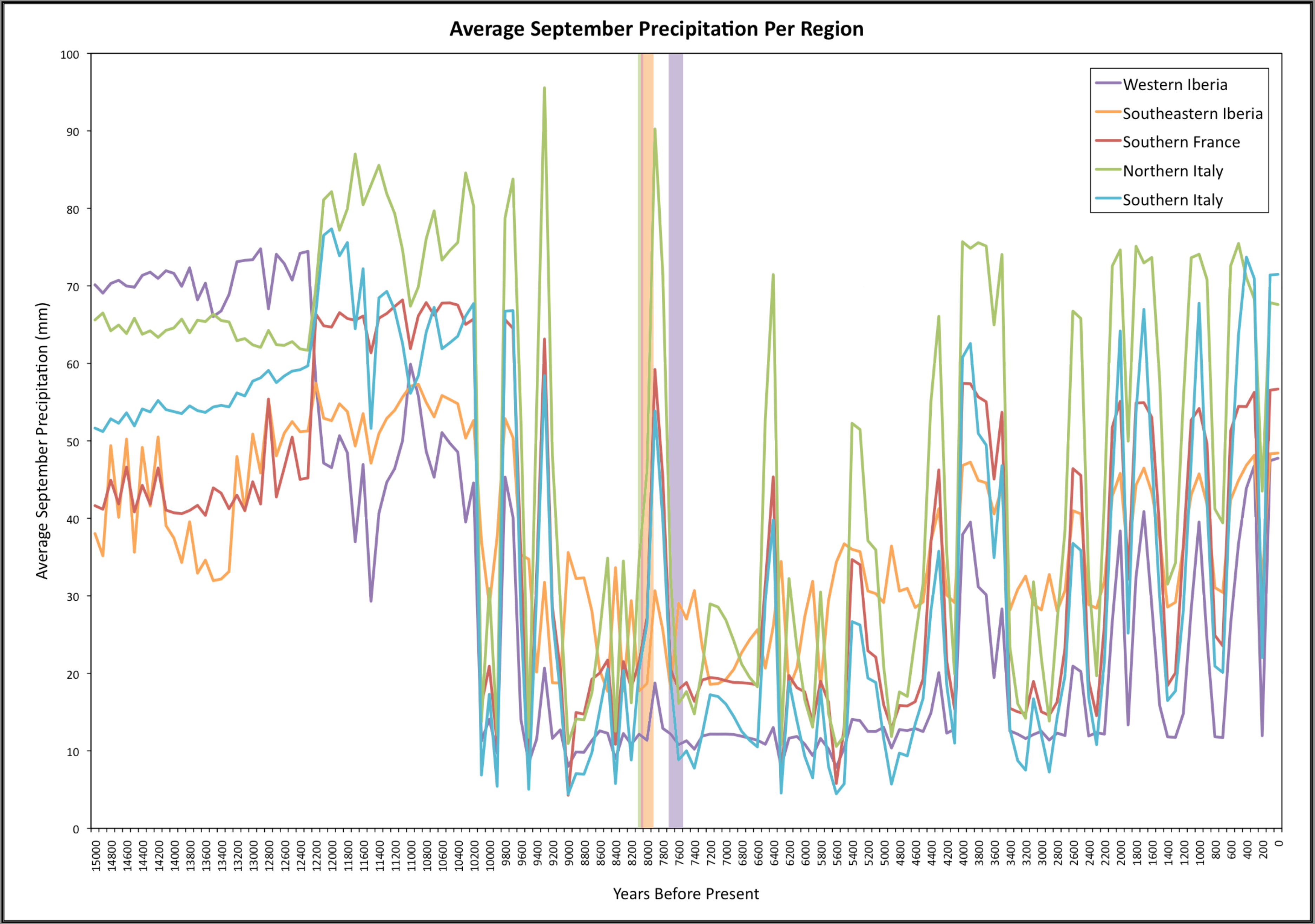
In the west Mediterranean, nineteen individual climate stations were modeled for precipitation, and twelve stations were modeled for temperature.


Average Annual Temperature Per Region
Average Annual Temperature (Degrees Celsius)
Years Before Present
Southeastern Iberia
Southern France
Northern Italy
Southern Italy

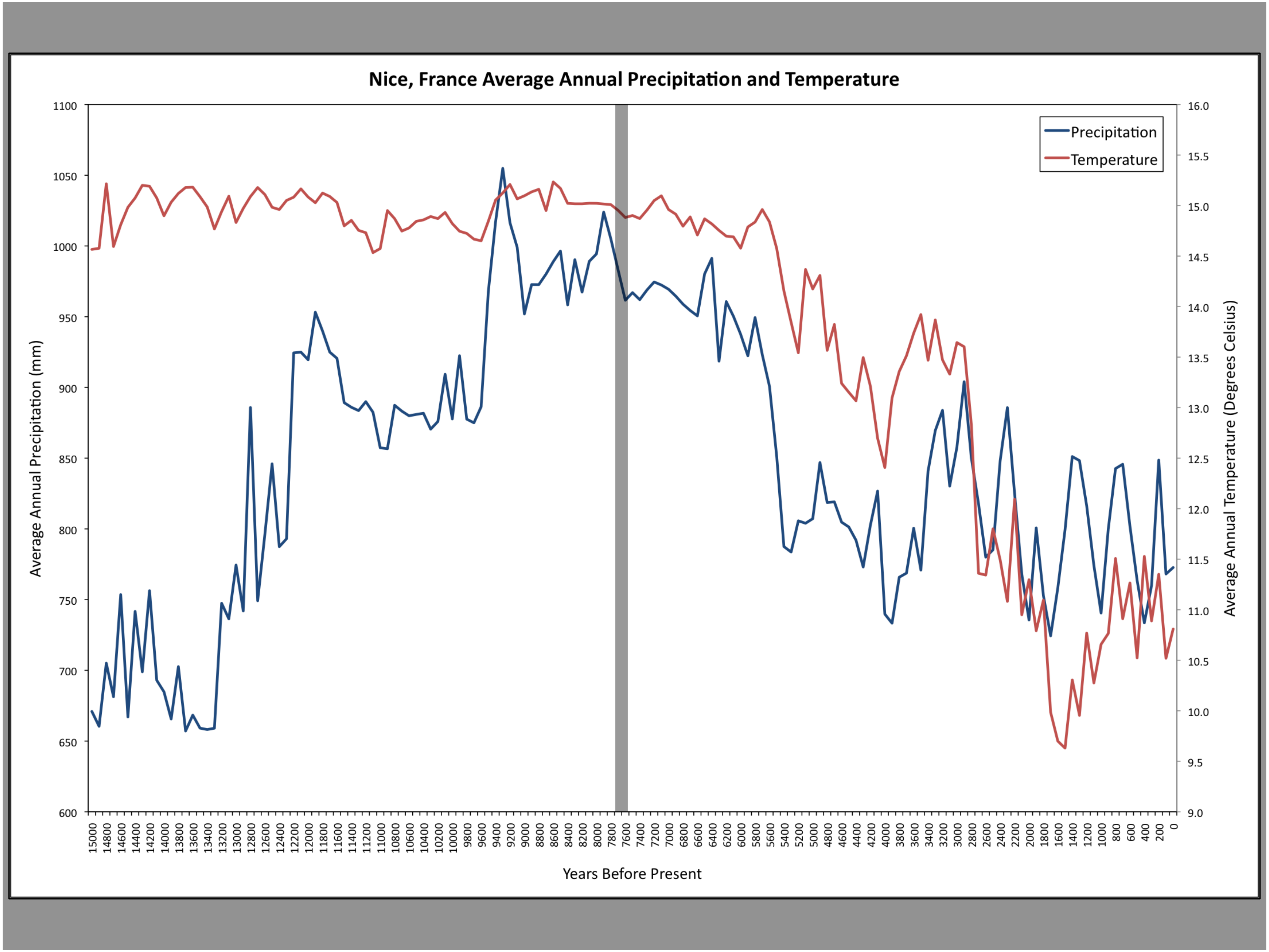


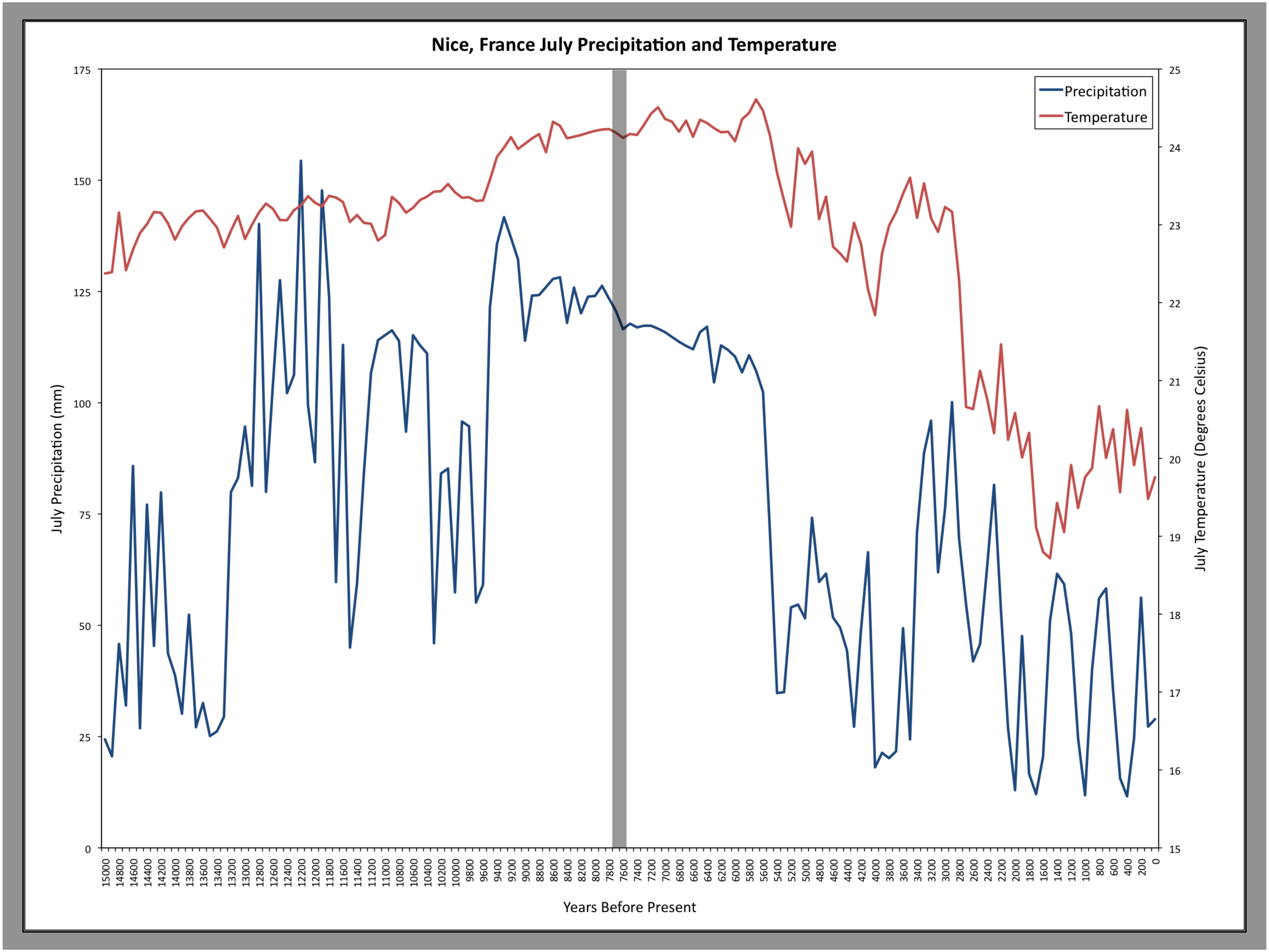
Average Annual Precipitation Per Region
Average Annual Precipitation (mm)
Years Before Present
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
15000
14800
14600
14400
14200
14000
13800
13600
13400
13200
13000
12800
12600
12400
12200
12000
11800
11600
11400
11200
11000
10800
10600
10400
10200
10000
9800
9600
9400
9200
9000
8800
8600
8400
8200
8000
7800
7600
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
4600
4400
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Western Iberia
Southeastern Iberia
Southern France
Northern Italy
Southern Italy

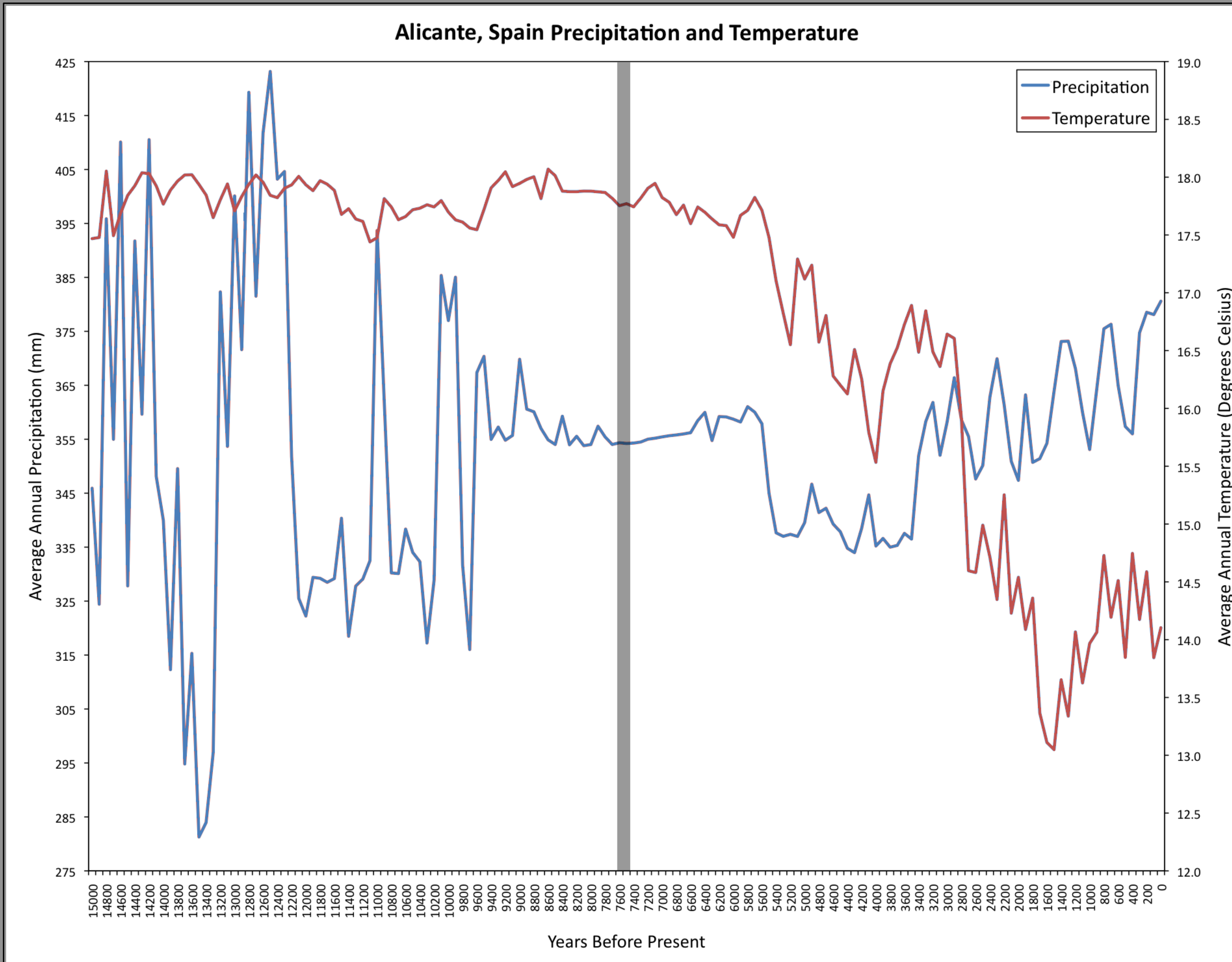

Average July Precipitation Per Region
Western Iberia
Southeastern Iberia
Southern France
Northern Italy
Southern Italy
Average July Precipitation (mm)
Years Before Present
0
25
50
75
100
125
150
175
200



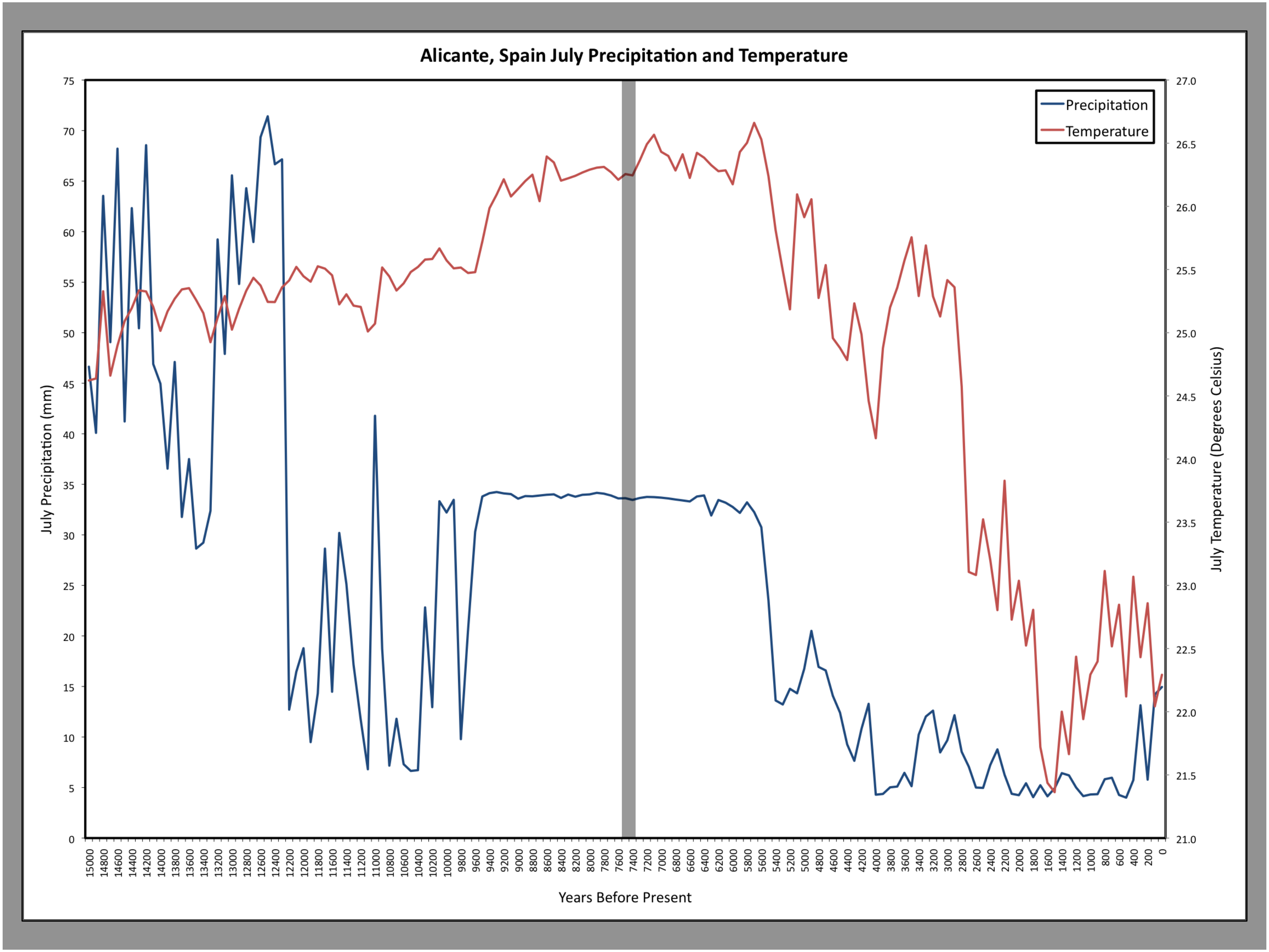
Average September Precipitation Per Region
Western Iberia
Southeastern Iberia
Southern France
Northern Italy
Southern Italy
Average September Precipitation (mm)
Years Before Present


Nice, France Average Annual Precipitation and Temperature
Precipitation
Temperature
Average Annual Precipitation (mm)
Average Annual Temperature (Degrees Celsius)
Years Before Present


Nice, France July Precipitation and Temperature
Precipitation
Temperature
July Precipitation (mm)
July Temperature (Degrees Celsius)
Years Before Present



Alicante, Spain Precipitation and Temperature
Precipitation
Temperature
Average Annual Precipitation (mm)
Average Annual Temperature (Degrees Celsius)
Years Before Present



Alicante, Spain July Precipitation and Temperature
Precipitation
Temperature
July Precipitation (mm)
July Temperature (Degrees Celsius)
Years Before Present

Some Initial Conclusions

- Temperature and precipitation are relatively static during the introduction of agropastoral systems.
- This climatic stability would have benefited colonizers in unfamiliar regions, and may have encouraged indigenous adoption of resources.
- Initial analysis of local climatic conditions does indicate changes in September precipitation which is likely a result of changing storm frequency

Acknowledgements

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