

“Climate change & wine. The influence on viticulture in Belgium and The Netherlands.”

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**WHAT SORT OF FUTURE ARE
WE GIVING OUR
GRANDCHILDREN?**



- IN THE OVERALL SCHEME OF THINGS, BY SAY 2080, IMPACTS OF GLOBAL WARMING ON THE WINE SECTOR WILL LIKELY BE AMONG THE LEAST OF HUMANITIES CONCERNS.
- Starvation, social and political unrest may be overwhelming..

CLIMATE CHANGE IN A GLOBAL CONTEXT

- Is likely to create considerable human misery
- Economic, social and political disruptions on an unprecedented scale
- Effects on the world wine industry among these other effects is almost trivial, but important to us

GLOBAL WARMING IS NOT IN THE FUTURE.... IT IS NOW

Temperature increases are recorded here and elsewhere in the world, and plants, animals and insects have been made extinct already

My experience with global warming

- I gave a paper on the subject at OIV Congress, Luxembourg, 1989
- I have a long standing interest in climatology and viticulture
 - The wine sector will be the “canary in the coal mine” for effects on world agriculture

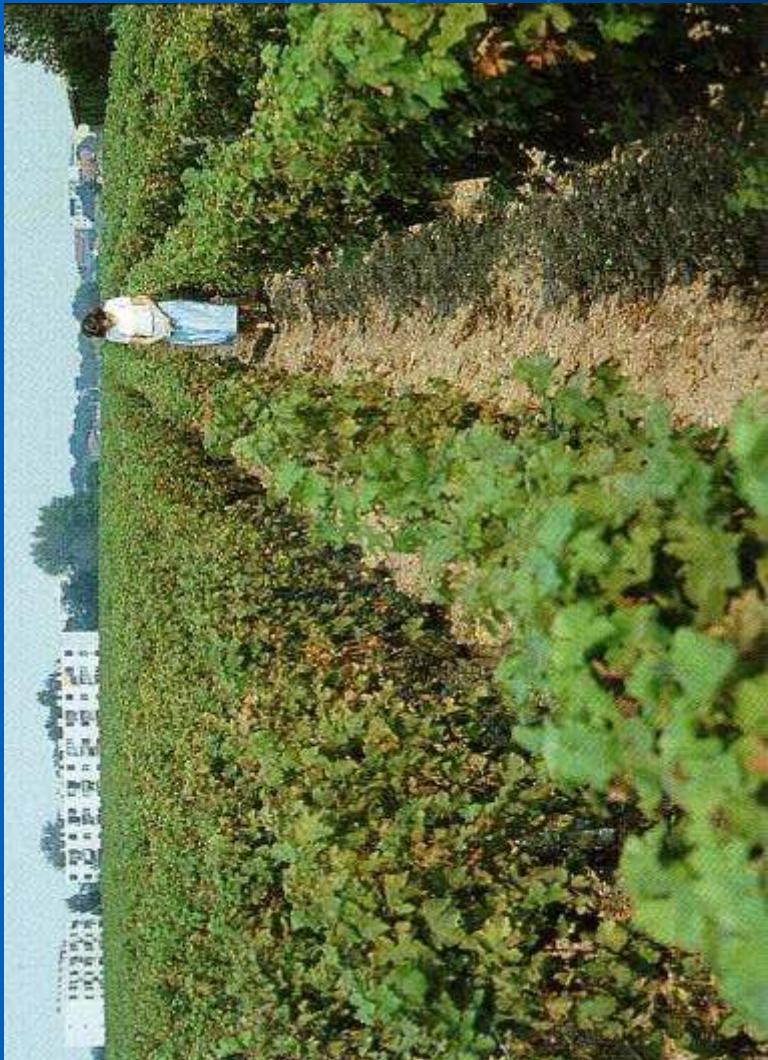
CLIMATE CHANGE WILL SERIOUSLY IMPACT THE WORLD WINE SECTOR

- Grapevines have a strict climate dependency, perhaps more than many other crops
- Climate determines wine style and quality
- Climate determines “regional” terroir



OLD WORLD EXPERIENCES OF TERRIOR

- Many generations of experience with vineyards, **have chosen appropriate varieties for the region**



Sun and heat effects



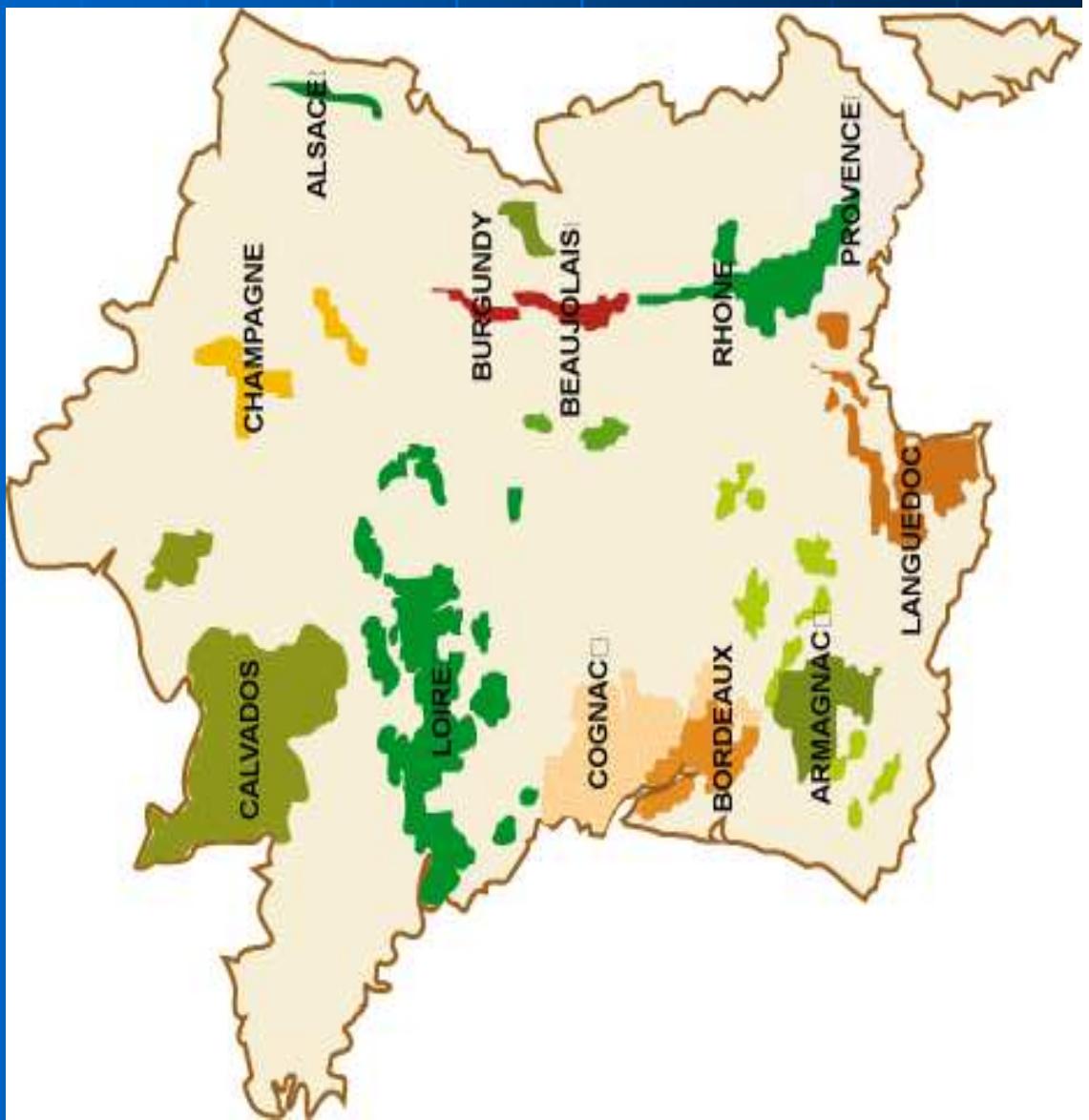


Implications of global warming for vines and wines

- Existing hot regions will become hotter, and maybe unsuitable for wine grapes. This may apply to parts of Iberia for example
- Existing cooler regions may loose their ability to make fine wines
 - Some regions ie Catalonia may become too warm in winter for dormancy
- Eventually the world wine map may need to be redrawn (continually)
 - Regulations may need to be altered

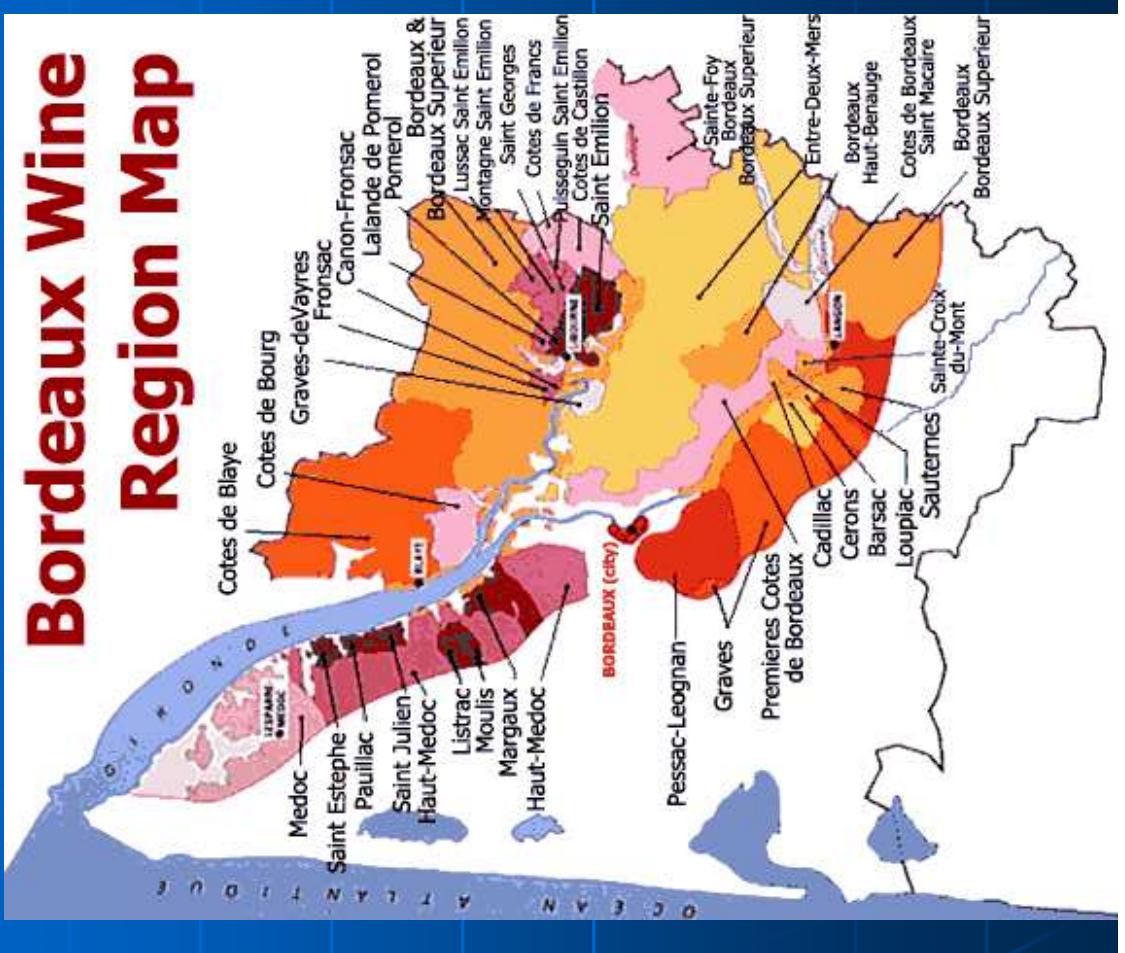
THE PRESENT, AN EXAMPLE...FRANCE

Discrete regions due to temperature by variety interaction



A FURTHER EXAMPLE... BORDEAUX WINE REGIONS

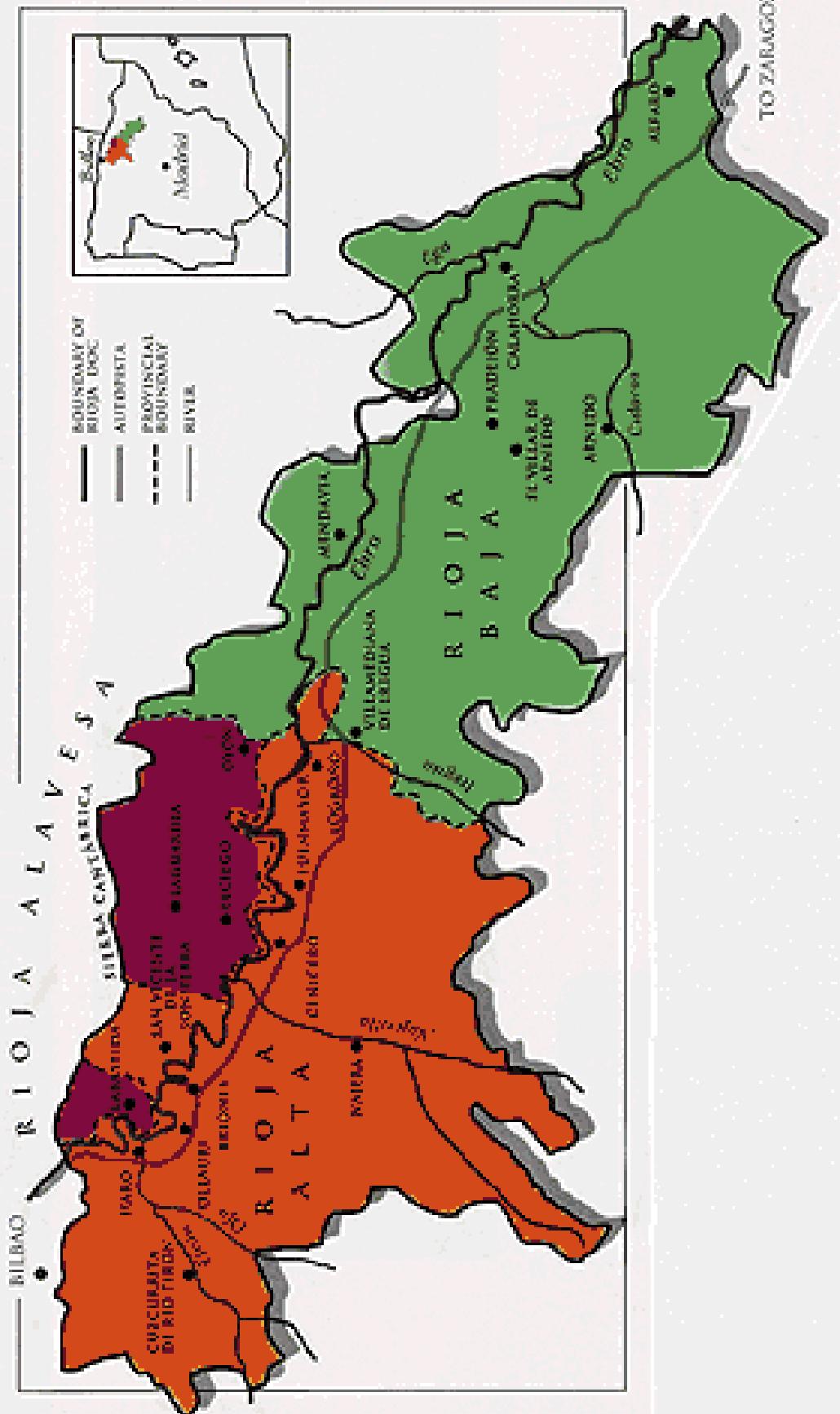
Bordeaux Wine Region Map



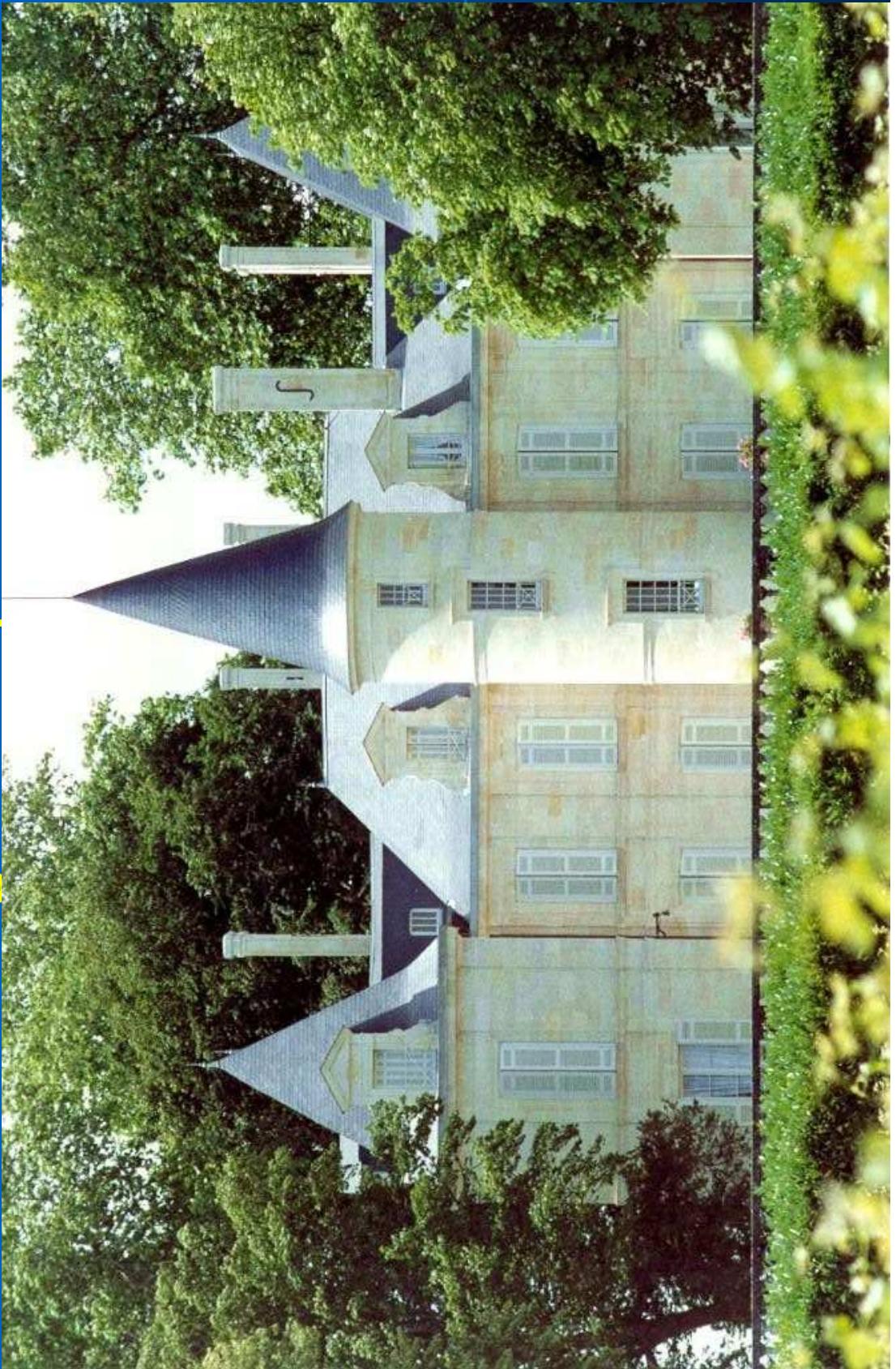
- Zones of speciality for Cabernet Sauvignon, Cabernet Franc, Merlot, Sauvignon, Semillon etc

RIOJA TOO

DENOMINACIÓN DE ORIGEN CALIFICADA RIOJA.

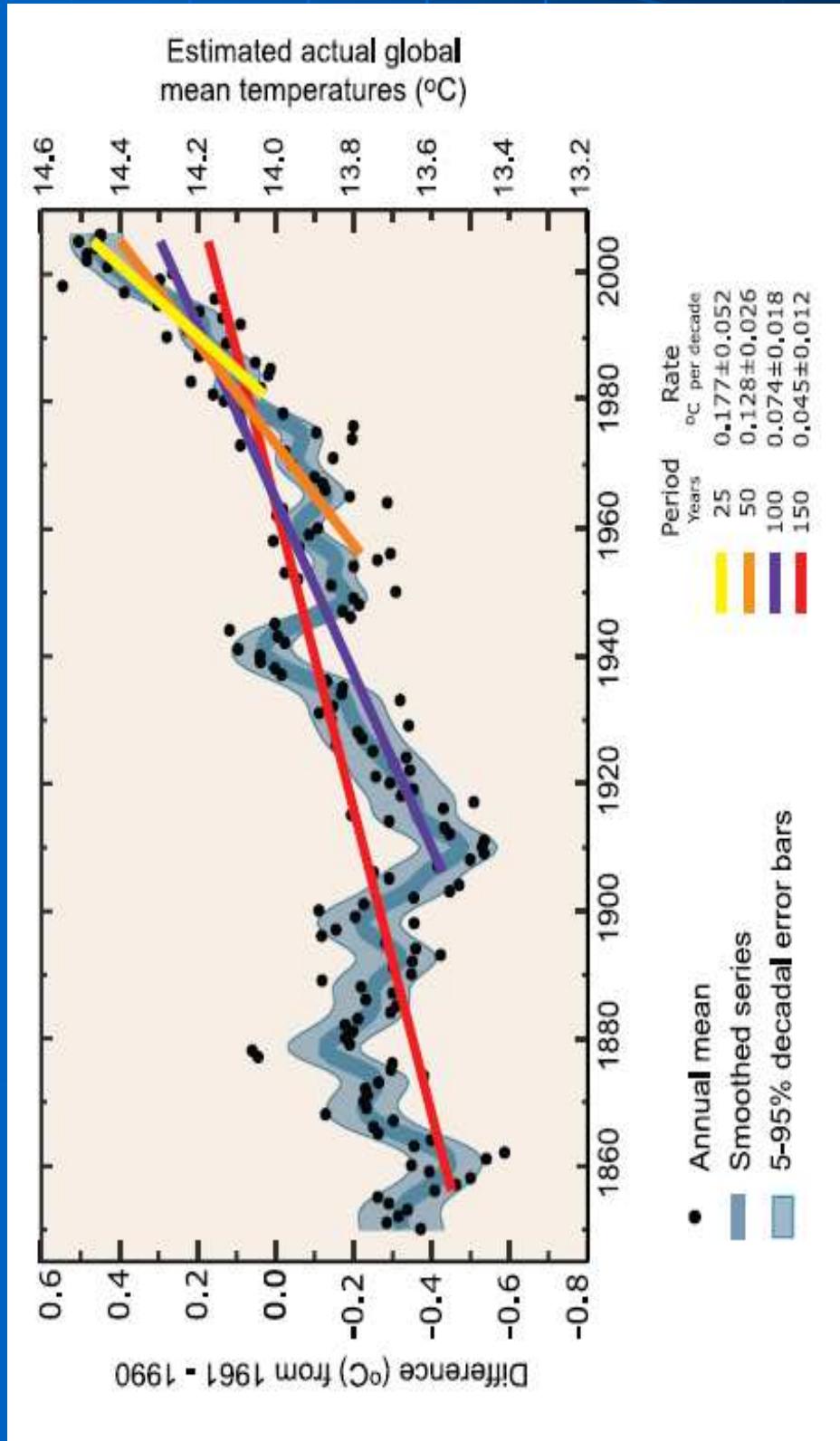


Reputation gives tradition,
infrastructure, services, investment,
high land prices etc

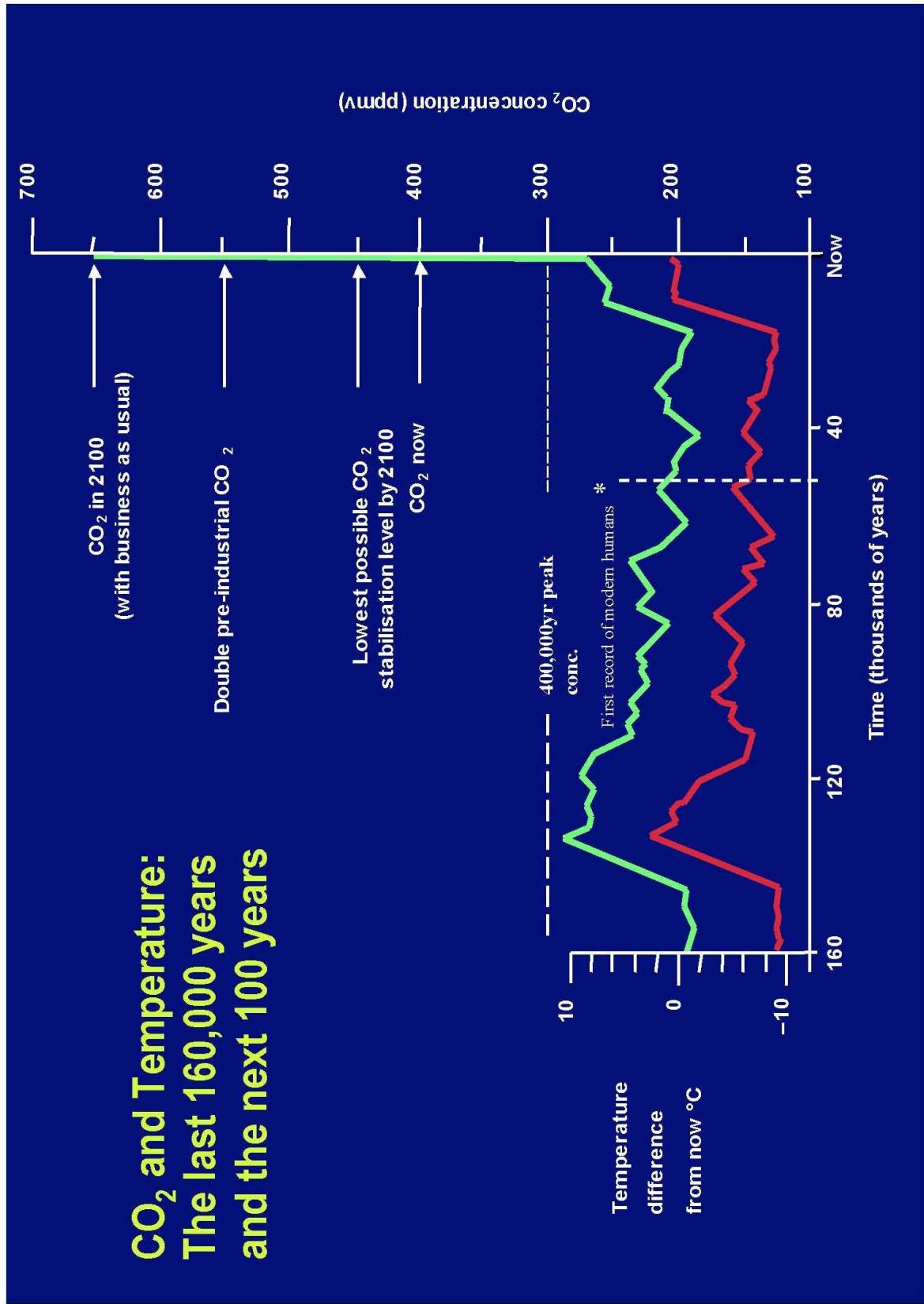


**NOW TO THINK
ABOUT THE FUTURE:**

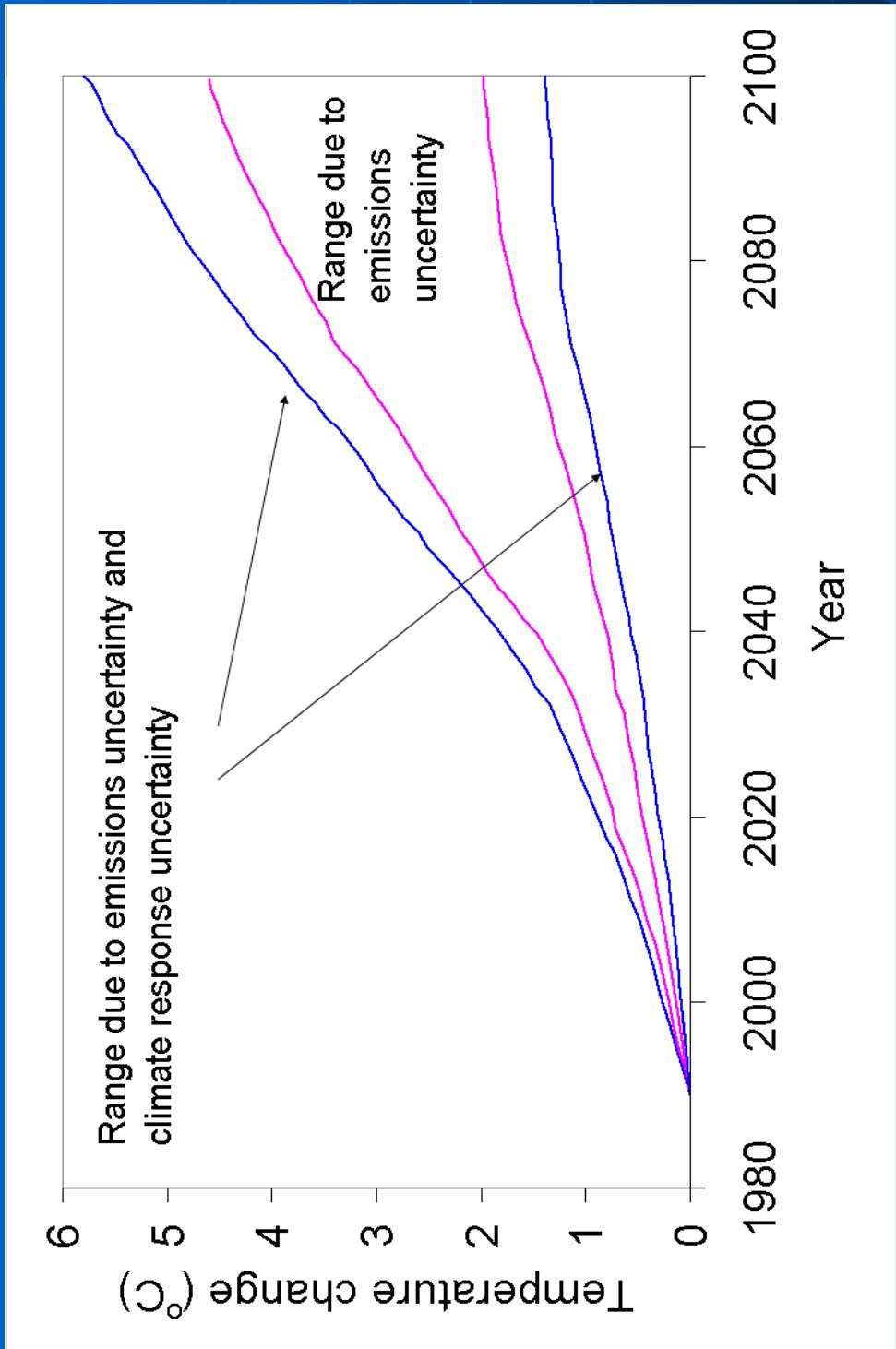
The globe is warming at an increasing rate



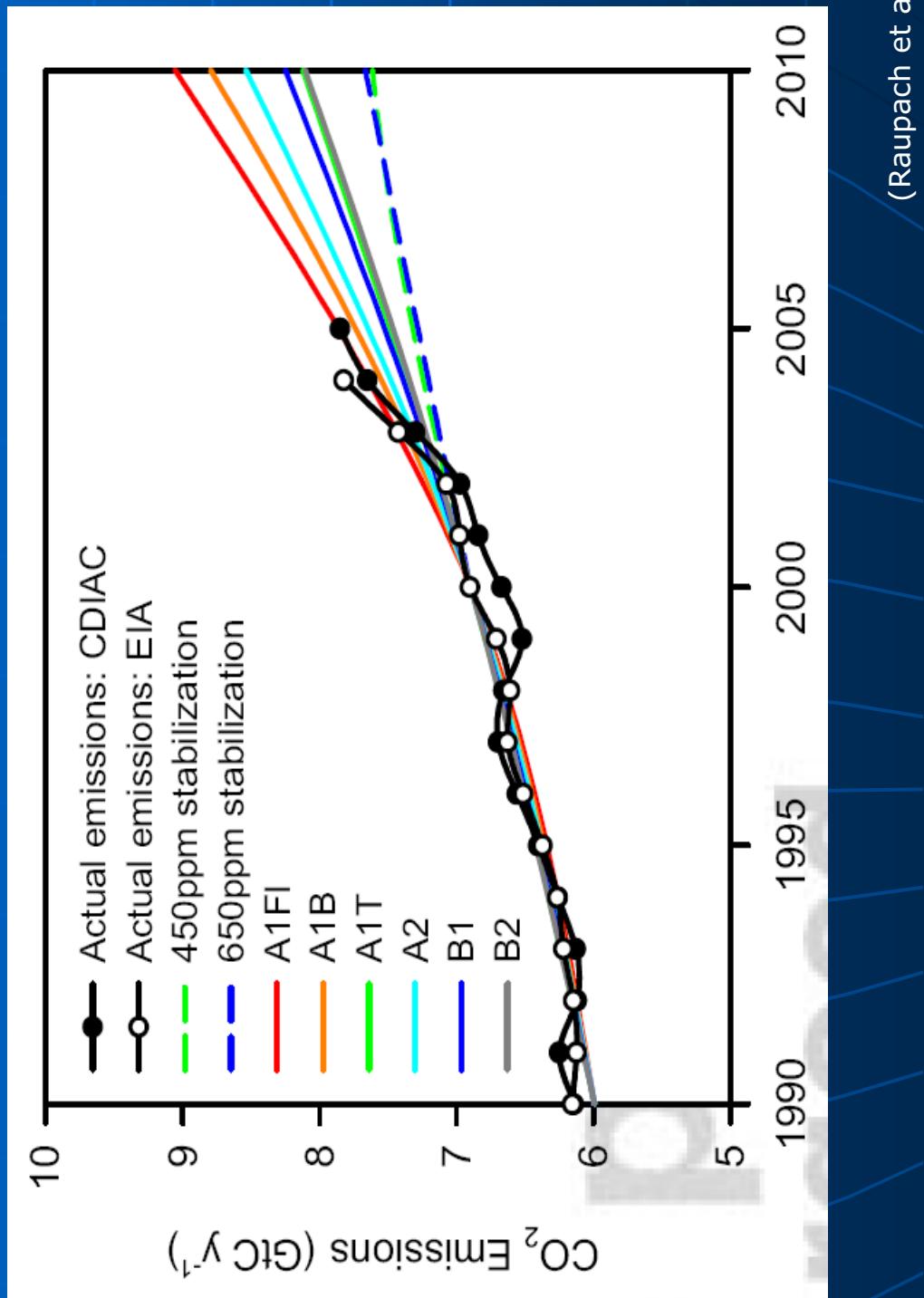
CO₂ and Temperature: The last 160,000 years and the next 100 years



Future temperature increases modeling future climates

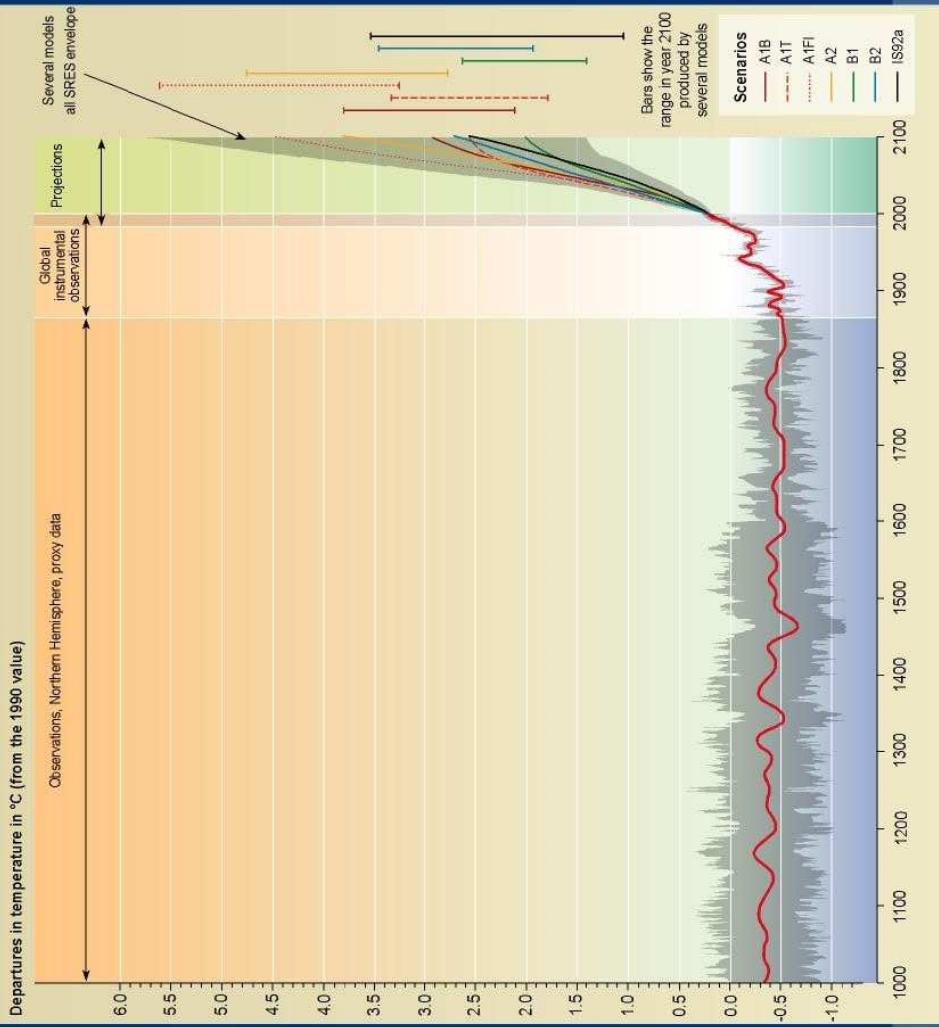


Actual global CO₂ Emissions are currently higher than the most extreme scenario



(Raupach et al 2007)

Variations of the Earth's surface temperature: year 1000 to year 2100



IPCC

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



WMO UNEP

Babies born around now will see the greatest changes in their lifetime . . .

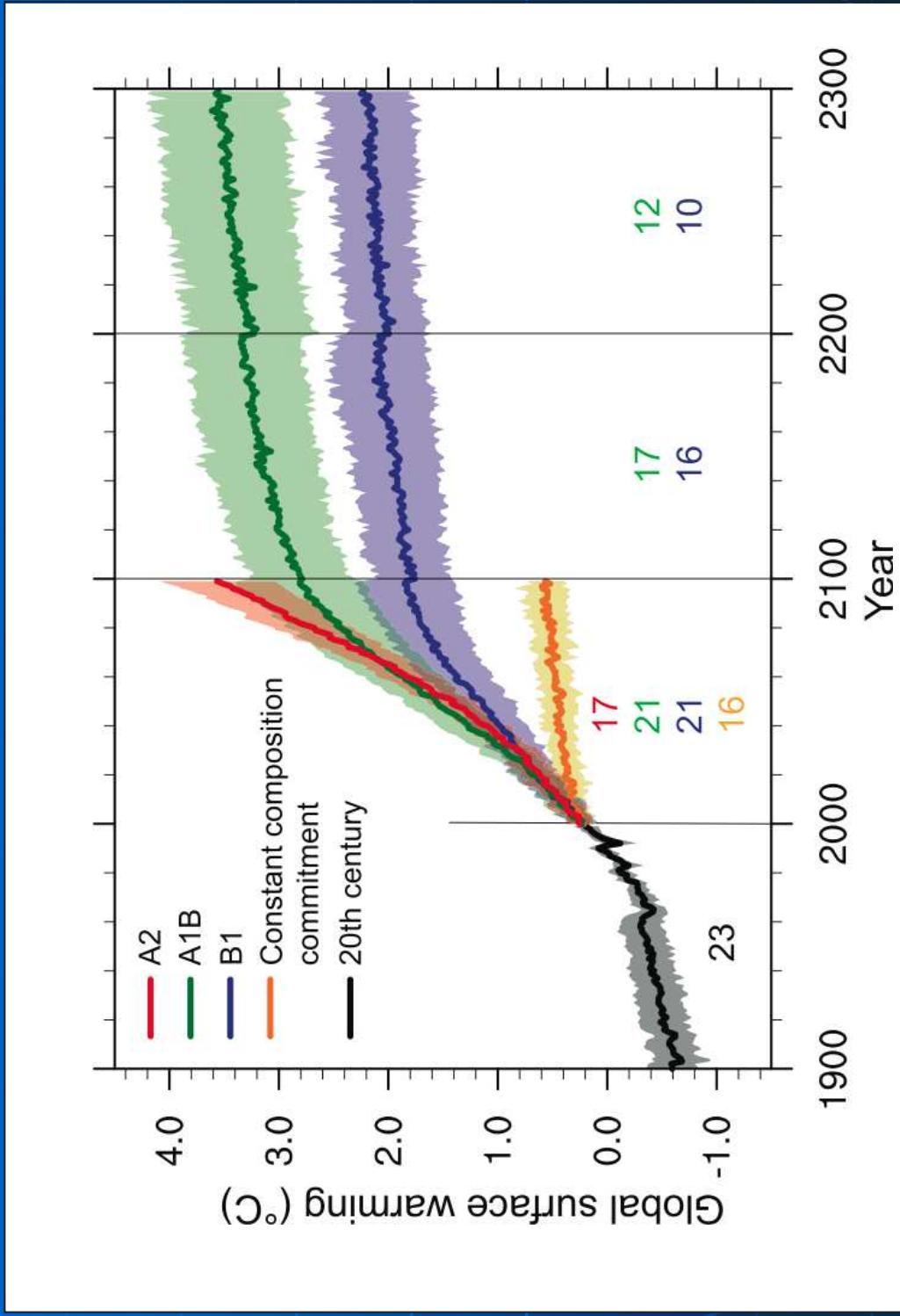
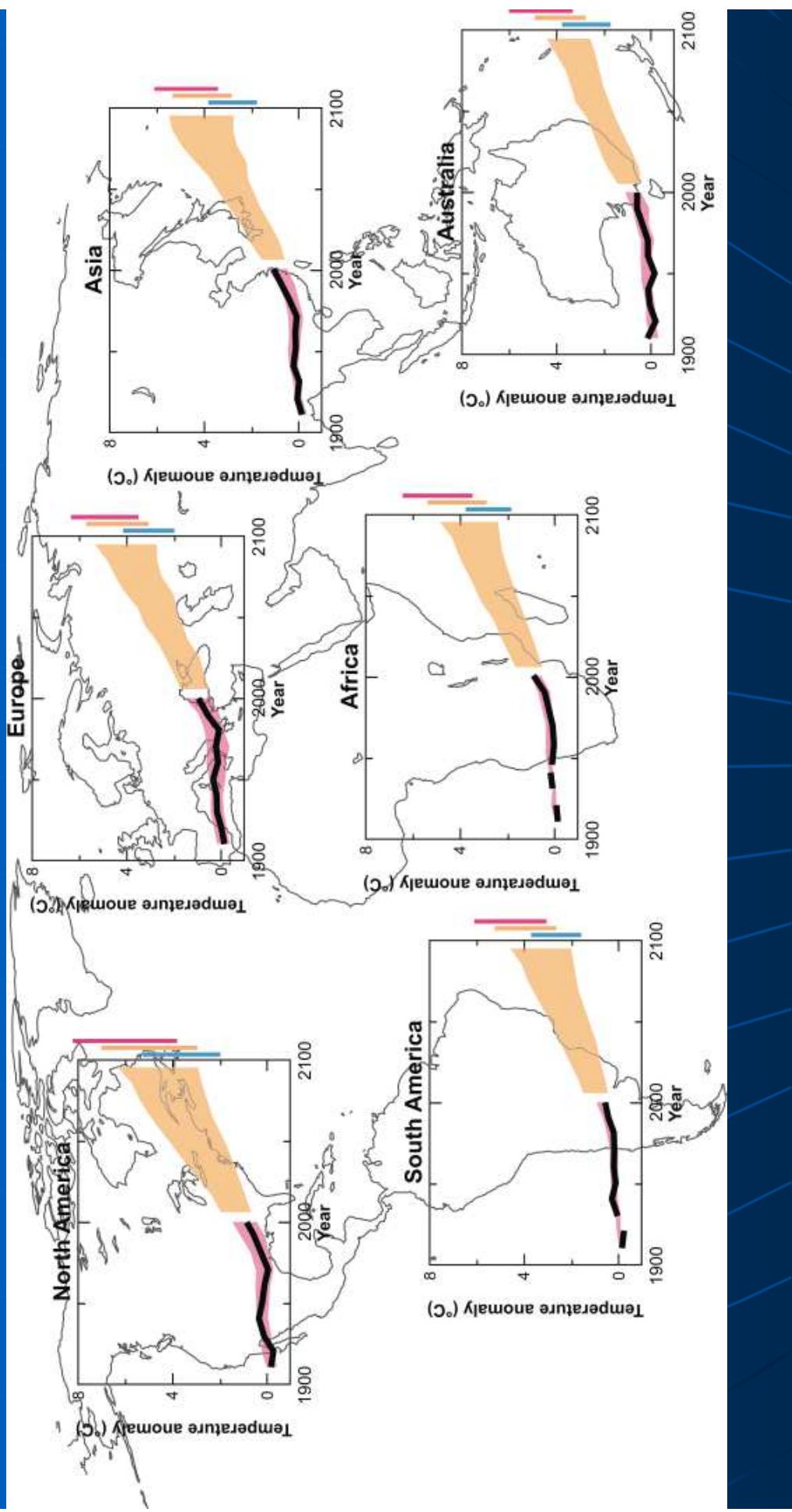
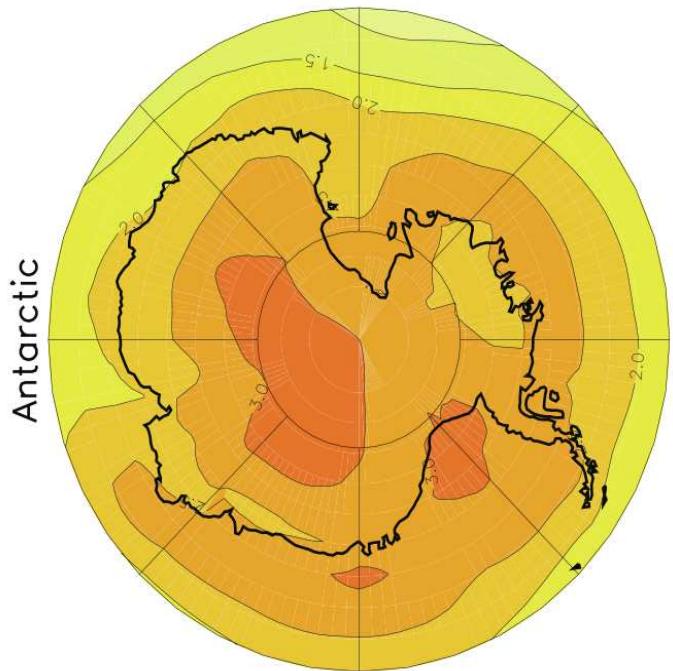
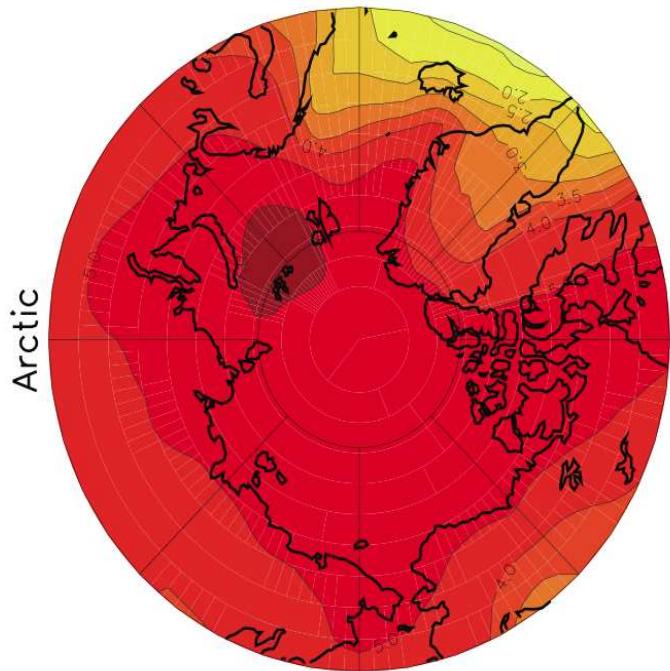
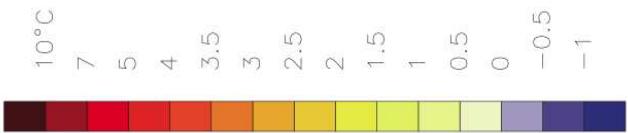


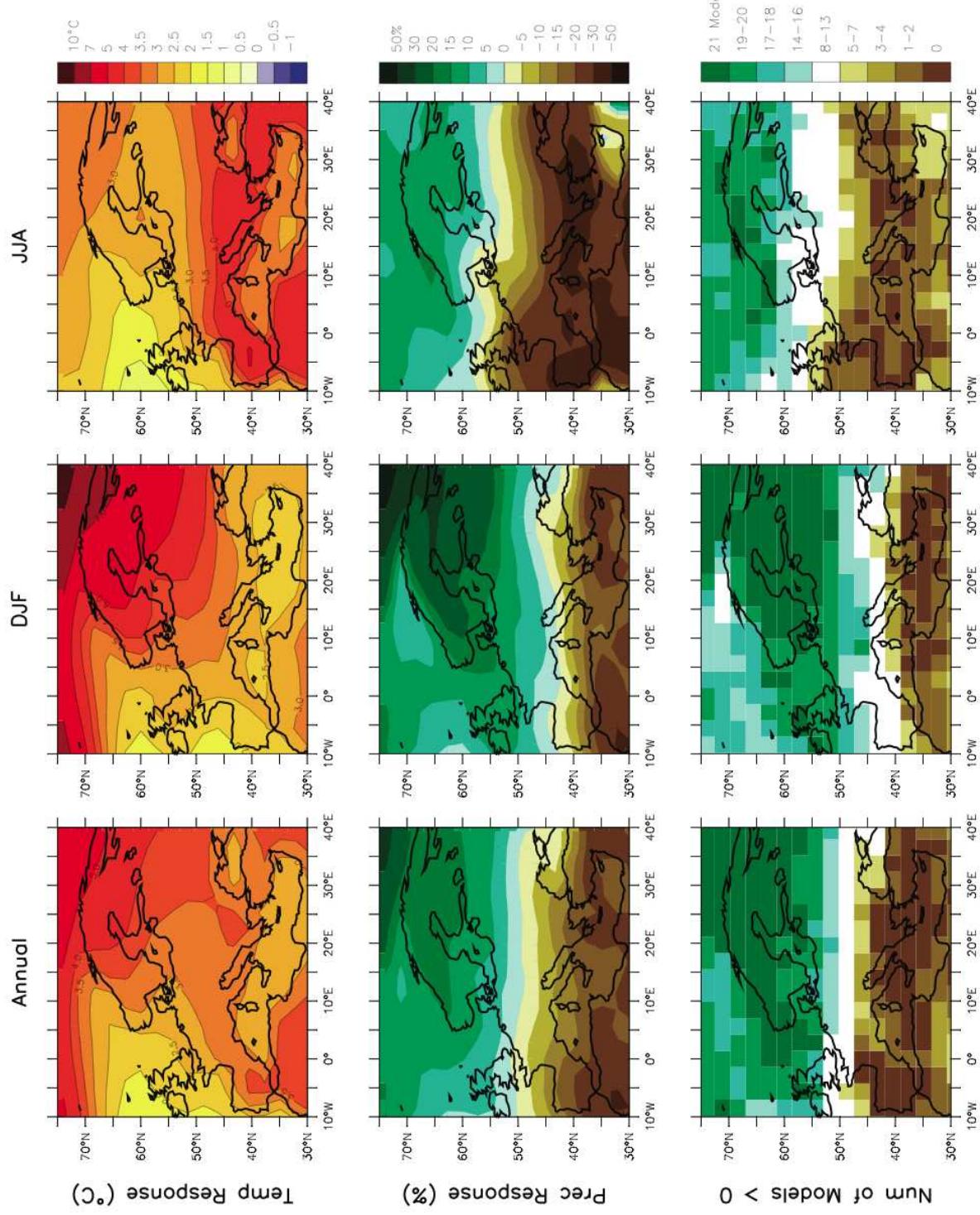
Figure 10.4

NOT ALL PARTS OF THE WORLD
WILL BE AFFECTED EQUALLY..



The Arctic
will be much
more
influenced
than the
Antarctic





— Figure 11.5

THE FUTURE....WHAT CAN WE EXPECT, IN GENERAL?

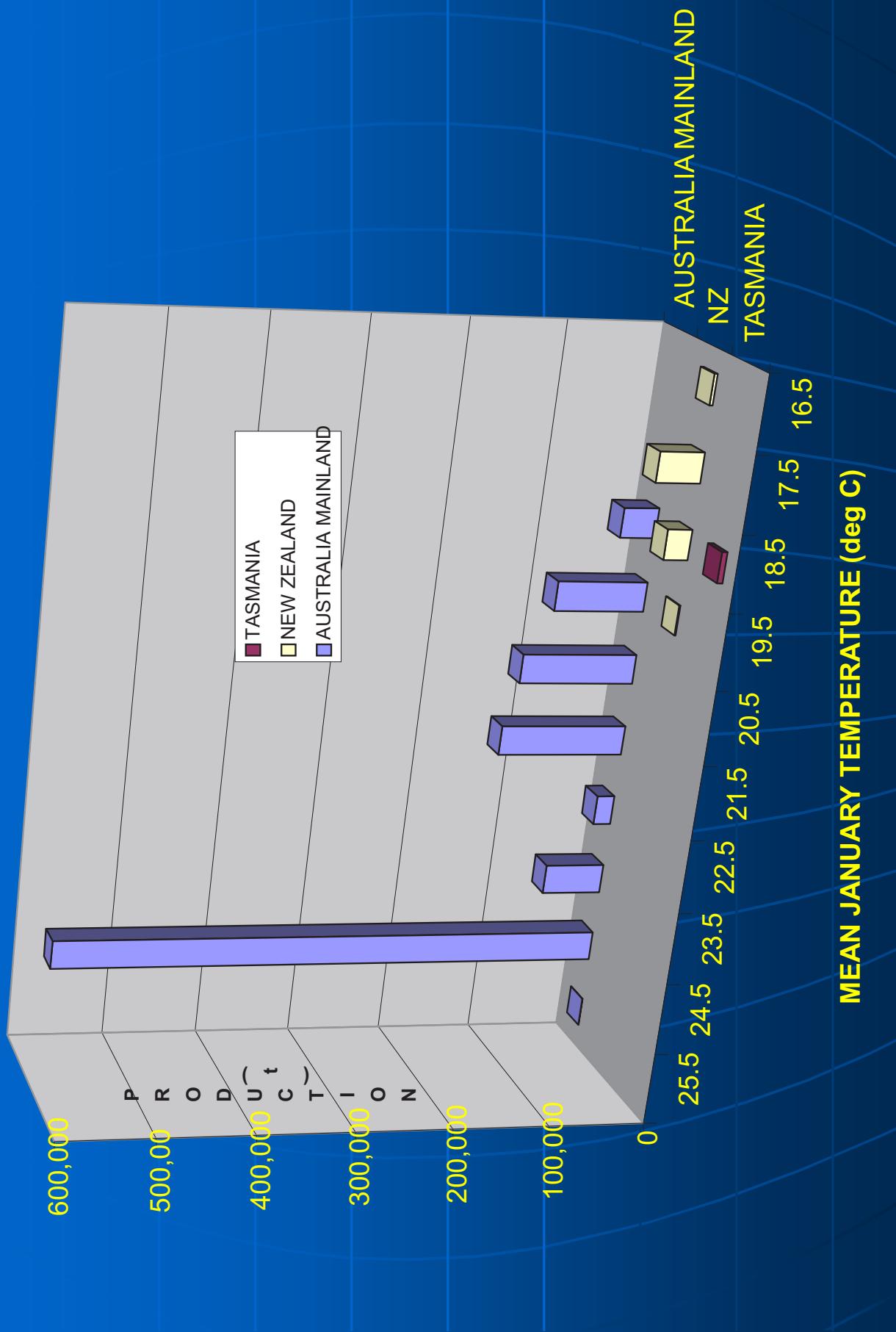
- Winters will not be so cold
- Fewer spring frosts
- Summers will be hotter
- Peaks of extreme heat
- Earlier bud break, flowering, veraison and harvest
- Harvest will happen during hotter temperatures
- Increased water use?
 - Vine pest and disease threats will change
 - PRESENT VARIETIES WILL BE LESS WELL SUITED
 - FROM A WINESTYLE/QUALITY POINT OF VIEW

AN EXAMPLE OF A PEST WHICH MAY MOVE... MOVE...

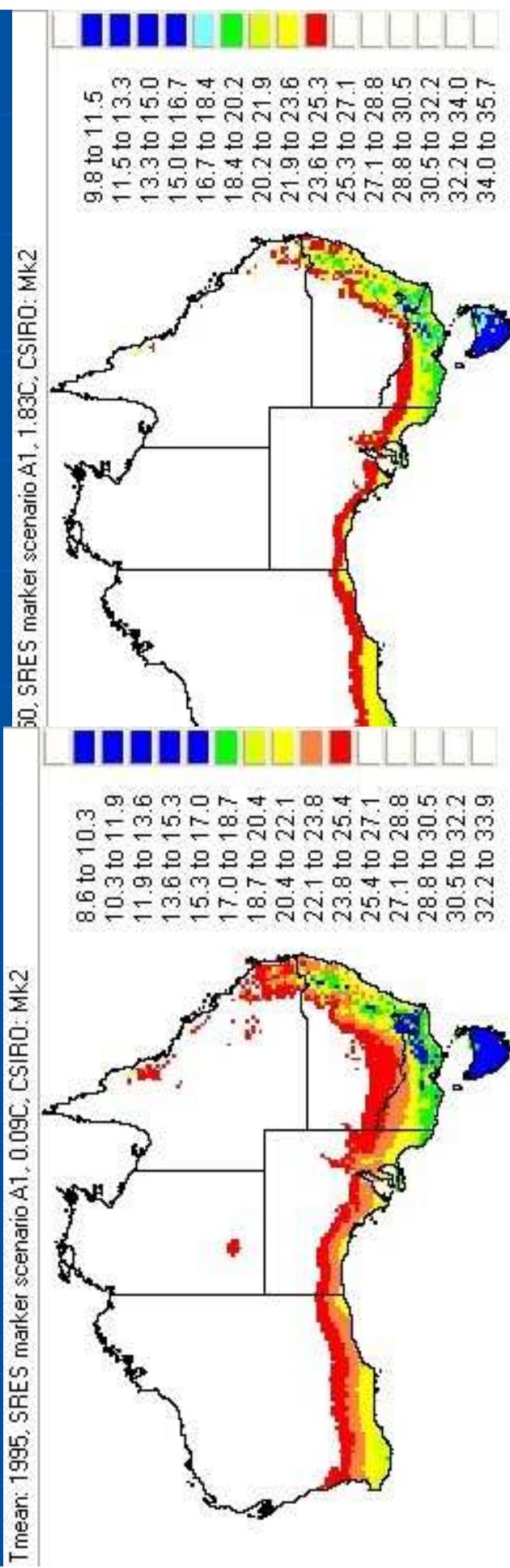
Multicoloured Asian Lady Beetle



- Now a problem in Ontario and US mid-west
- Taints wine with methoxypyrazines
- Has been introduced in Italy, and is now in UK and Belgium.



THE SHRINKAGE OF THE AUSTRALIAN WINE INDUSTRY



SO WHAT CAN WE DO?....

Simply, change regions or change varieties....

- Obviously easier to change varieties.
- Will need new varieties for existing hot regions
- Existing warm and cool regions will be best off
- There will be new "cool" regions ie England, Denmark, Belgium, Holland

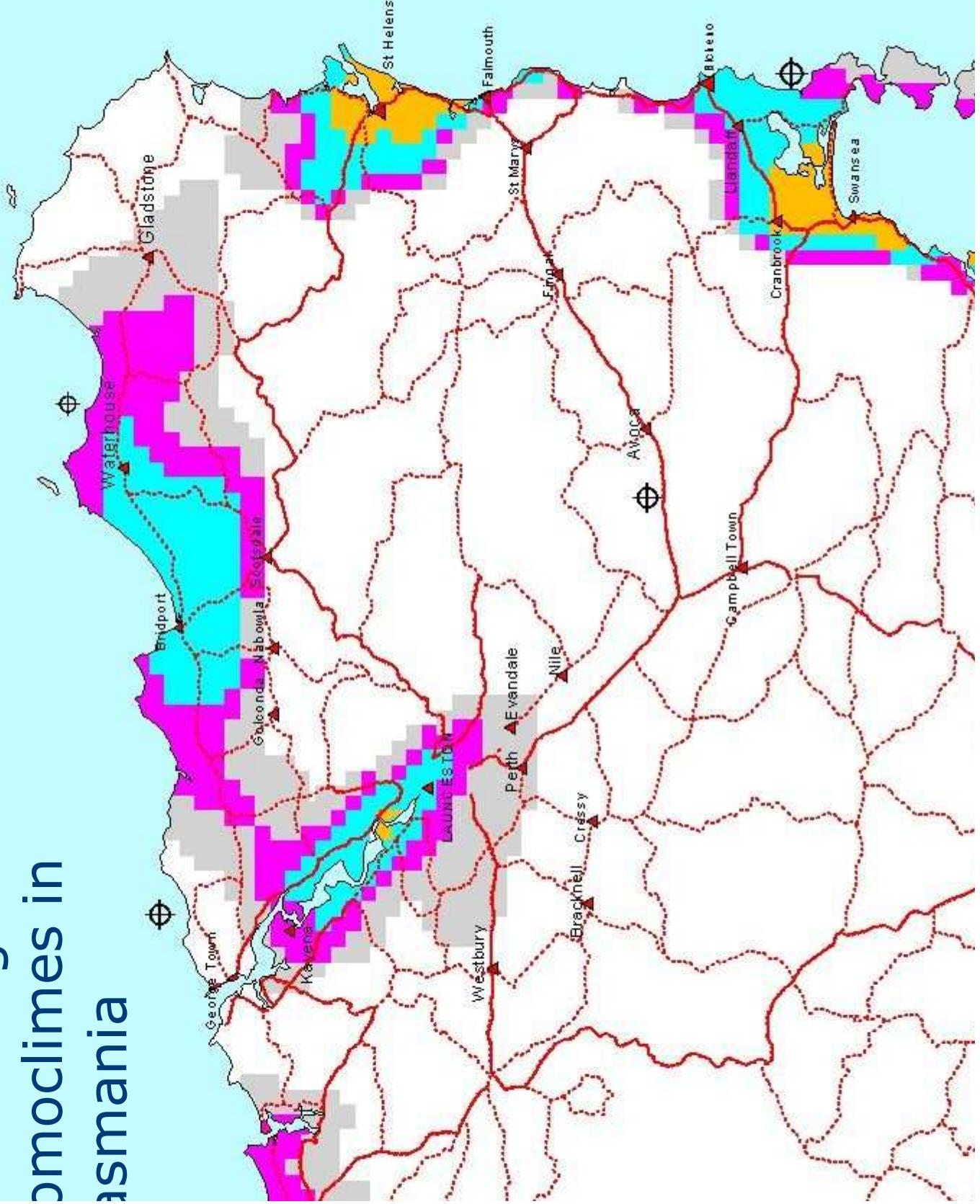
GENERAL PRINCIPLES FOR FINDING NEW, COOLER REGIONS

IN NORTHERN HEMISPHERE

- Move north
- Move to higher elevations
- Maybe, move to coast



arborough bioclimes in Tasmania



CONCLUSION

- The solution to halting climate change is political...
- Wine producers and consumers should add their voice to the political process
- Climate change is becoming a major voter issue

A final word from Charles Darwin

“It is not the strongest of the species that survives, nor the most intelligent that survives.”



“It is the one that is the most adaptable to change.”

Acknowledgements : Leanne Webb, Penny Whetton, ViTUM (Melbourne University Viticulture)