

Conference trip report

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EVENT DETAILS

Conference title	Second International Conference on Climate change: Impacts and Responses.
Sponsored institution	Common Ground publishing, University of Queensland
Date and time	8-10 July 2010
Venue and location	Able Smith Lecture Theatre - Building 23, University of Queensland
Discipline/research focus of conference	Multidisciplinary research, focused on discussing evidence of climate change impacts, its causes and impacts on ecosystem and human. The conference also explored technological, policy and social responses to climate change

DESCRIPTION OF THE EVENT

The Conference is an annual event to showcase climate impacts and responses to researches and parties involved in climate change research. The first conference was held in Bharati Vidyapeeth Institute of Environment Education and Research, Pune, India January 2009. The second conference was held 8-10 July 2010 in Brisbane, Australia. The conference was run and supported by Common ground publishing and hosted and co-sponsored by the University of Queensland. Purpose of this conference was to create interdisciplinary forum for discussing the evidence and impacts of climate change and also exploring technological, policy, strategic and social responses to climate change.

EVENT DELEGATES

About a hundred delegates participated in the conference from 25 different countries around the world representing various institutions.

CONFERENCE STRUCTURE AND MY ATTENDANCE

The conference was mainly structured with a plenary session and grouped parallel sessions with different themes. The parallel sessions were divided in 4 different streams; 1) ecosystem impacts, 2) scientific evidence, 3) human impacts and 4) technical, political and social responses to climate change. I focussed on the Scientific Evidence and Ecosystem impact sessions as they were more relevant to my field than the others.

In addition to the conference content, there were opportunities to discuss my study with other researchers and I obtained some feedback.

WHAT DID I LEARN?

Attending this conference gave me a opportunity to present some outcomes of my research to the public and to learn from others how they deal with the climate change impacts on across a wide variety of sectors. For example, discussion with Mr Eman Caley, University of Warwick, UK, (studying the Potential impact of climate change on diseases affecting the strawberry industry in UK), was helpful for me to compare my study and get some feed back from him. Particularly his use of GIS tools to map the potential areas prone to strawberry disease in the future has potential cross over with my own research. In his study he identified regions prone to strawberry diseases under climate change based on projected weather conditions that are favourable for outbreak of the diseases. The methods of this study and my study were comparable in terms of finding the particular relationships between climate parameters and plant response (grape fruit quality or strawberry diseases), and using that relationship to project future plant responses under changed climate condition and also using spatial analysis tools. The message I took home was that a similar project focusing on climate change impacts on grape vine diseases in Australian wine industry could be beneficial.

Presentation on Potential Effects of Climate Change on Fruit Quality by Sukhvinder Pal Singh from was also highly relevant to my study. In his presentation he pointed out potential negative impacts of climate warming on quality of horticultural fruits such as apples and mangos. The main focus of this presentation was on an extensive literature review and it showed that fruit colour (anthocyanins level) was a one of the important parameters of fruit quality for consumer acceptance. As the colouring of fruit is influenced by climate temperature and radiation the future warming could potentially affect the colouring of the fruits and consumer acceptance

OTHER

It was an important conference for me in terms gaining experience in delivering a presentation before a large audience. The conference was multidisciplinary, encompassing many different types of researches and as such it increased my exposure to different research approaches and findings related to climate change.

I greatly appreciated the opportunity to attend.

ATTACHMENTS

Attached is the copy of my presentation for the conference. It was delivered on 10 of July 2010.

CONTACT DETAILS

My contact details are shown below for follow ups.

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2nd International conference on
Climate Change: Impacts and
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Use of natural temperature gradients for evaluating potential impacts of climate warming on fruit quality of wine grapes

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Introduction



- Grape vine growth and fruit quality are sensitive to temperature variations
- Climate is warming and projected to warm in coming decades
- Impacts of climate change on grape fruit quality of wine grape varieties are unknown



Potential impacts of climate change on viticulture: 1. Overseas studies.

- **Earlier ripening** by the end of this century in California and it might lead to **reduced grape quality** in the region (Hayhoe *et al.* 2004)
- Impacts of climate change on **wine quality will be uneven** across world's wine regions **depending on current climate** (Jones *et al.* 2005)
- Potential **yield loss** of perennial crops **due to climate change** in California (Lobel *et al.* 2006)



Potential impacts of climate change on viticulture: 2. Australian studies.

- **Shortened growing season** with **earlier budburst** and **earlier harvest** in major wine growing regions in Australia (Webb *et al.* 2007)
- Without adaptive measures **wine grape quality** in Australia will **decrease** by up to 7 % to 39% by 2030 due to the climate change (Webb *et al.* 2008).
- **Wine quality is likely to decrease** in Australia due to increased temperature that exceeds the optimum range for premium wine production (Hall and Jones 2009)

Climate change impact study approaches for grape and wine quality

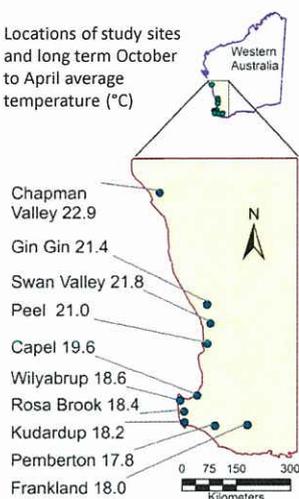


- To date, studies that attempted to evaluate effects of climate change on grape and/or wine quality relied on **proxy measures such as grape price or vintage scores**.
- In this study we used **direct measures of fruit quality** to assess the effect of warming

Current study



Locations of study sites and long term October to April average temperature (°C)



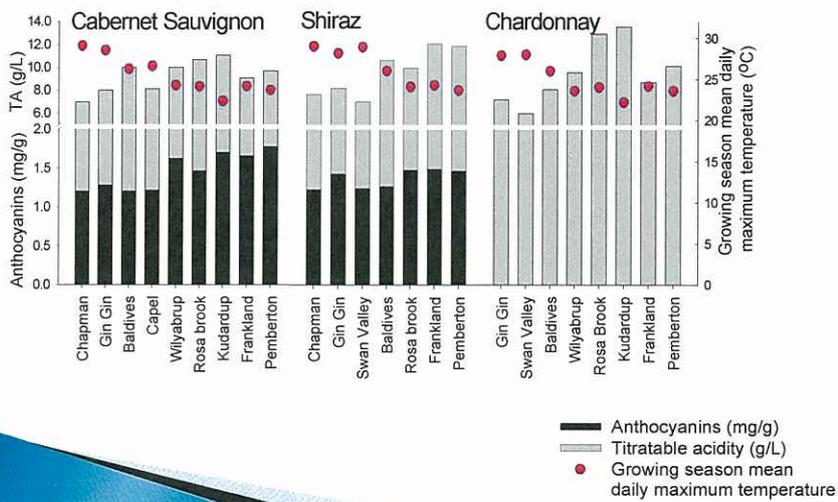
Monitoring sites and temperature differences

- Sites along the natural temperature gradient in Western Australia.
- About **5 °C difference** in growing season average temperature
- Above difference is within the projected warming in next 50 years

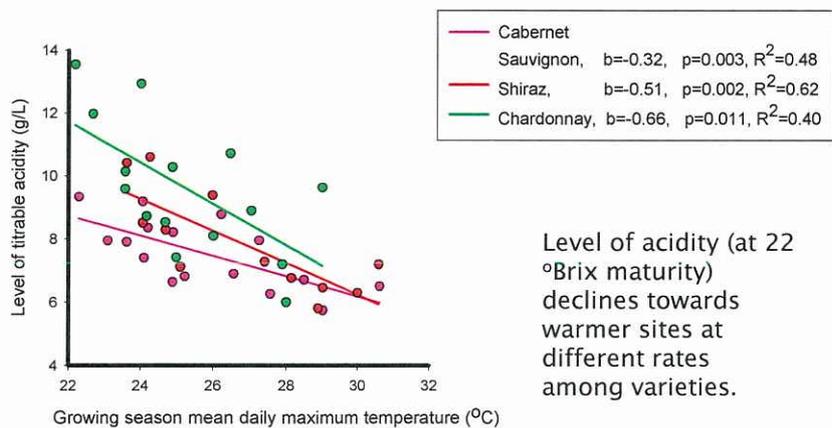
Fruit sampling and analysis

- Weekly sampling of fruit and subsequent chemical analysis during 2008-2009 and 2009-2010 seasons
- Analysis of titratable acidity, pH and colour at 22 °Brix maturity

Results: Temperature and fruit quality parameters at 22 °Brix maturity (2008-2009 season)

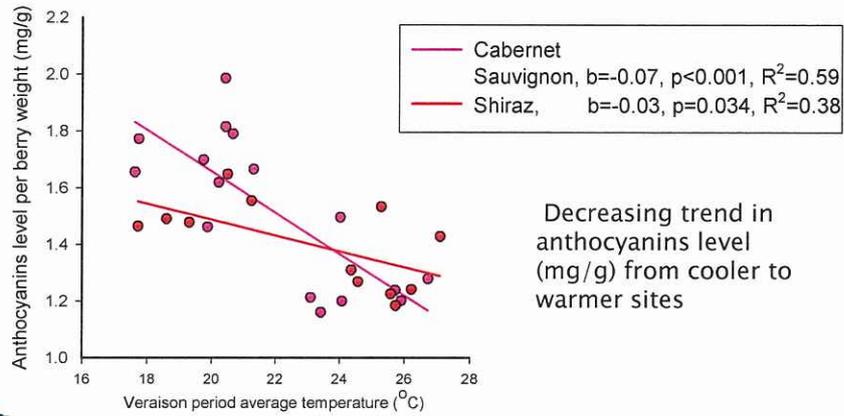


Results: Increased Growing Season temperature leads to loss of acidity

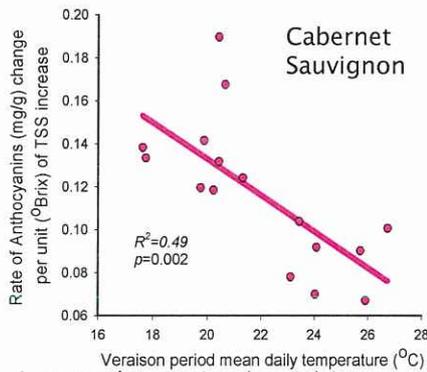


Level of acidity (at 22 °Brix maturity) declines towards warmer sites at different rates among varieties.

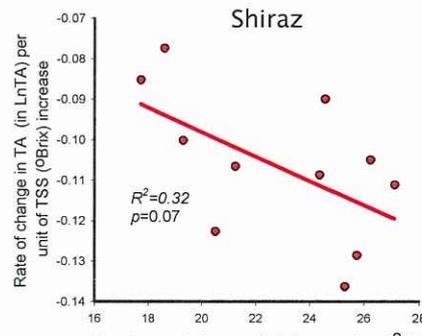
Results: Decrease in berry colour under warmer ripening temperature



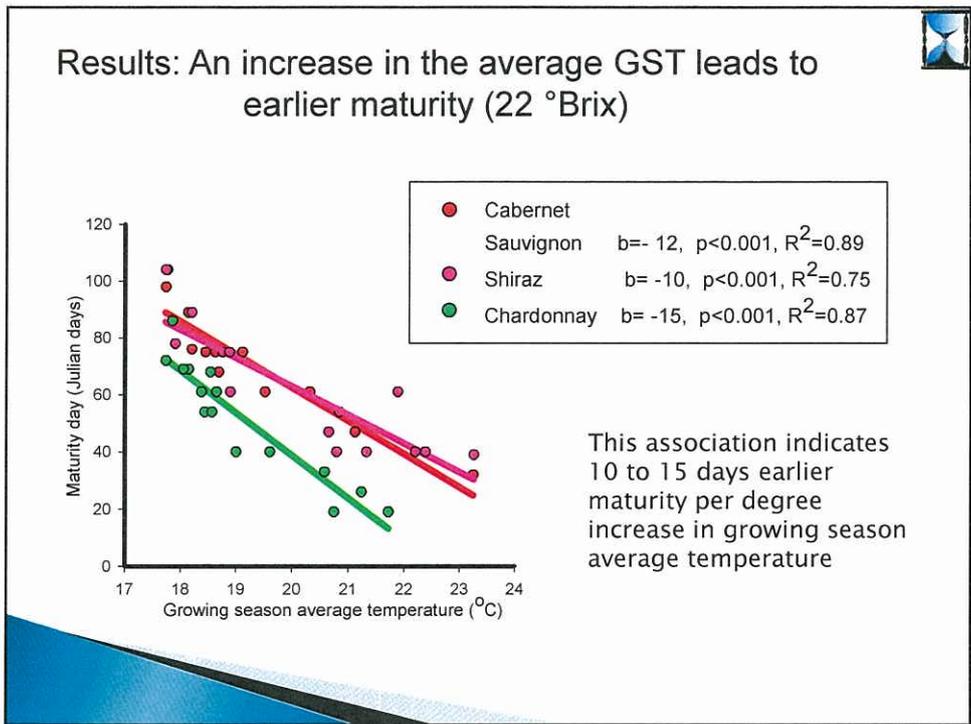
Results: Slower accumulation of colour and rapid loss of acidity per unit of sugar increase under warmer temperature



- Less anthocyanins (mg/g) increase per increase in sugar when ripening period temperature increase



- More intense acidity loss per sugar increase when ripening period temperature increase



Summing up: Potential climate change impacts on wine grape fruit quality

What did we find?

- Inverse relation between growing season temperatures and grape quality attributes

What do we know about the future temperature ?

0.4 to 2.1 °C increase in south west of Western Australia by 2030 (CSIRO 2007)

What can we conclude?

Therefore, under existing vineyard management practices, fruit quality of the three varieties that currently dominate the Australian wine grape production is likely to be negatively impacted by the projected warming during the growing season.

Thank you



Acknowledgement

- This study is supported by the CSIRO Climate Adaptation Flagship and GWRDC postgraduate scholarship.
- We also would like to thank to vineyard owners and managers for their support for this study.