From the President

Auckland started the new millennium in a fitting way acting as host to a review of papers held by Working Group 1 of the IPCC (Intergovernmental Panel for Climate change). Sir John Houghton's public lecture on the Science of climate change was very well attended with standing room only. It is sad for me to report that out of all those people there were only about a dozen Met Society members. Anyway, I've written a report of this meeting under "Northern News" found in this newsletter. One point worth underlining is that we already KNOW what we should do to mitigate our damage but there is not yet the will power for much to be done.

Well, just to show that your committee do not lack the will power to act, we have been looking at ways to resolve the problem that our journal ("Weather and Climate") has fallen into: it is three issues behind. The basic problem is that not enough papers are being submitted. Last year its editor, Kim Dirks, organised a special email campaign to rustle up some contributions (thanks Kim), and indeed this has brought some fruit. After ten years of deregulation it appears that there has been a drop in time available to our meteorologists and climatologists for articles for our journal. So in our first meeting this year we examined a few options and decided to, albeit regrettably, reduce our journal to just one annual issue. Taking this course of action involves having to compensate current and past subscribers for any issues which are to be written off and also involves a review of subscriptions rates. A subcommittee has been formed to cover these issues and their recommendations are being considered in our March meeting. We are hoping that changing "Weather and Climate" into an Annual will result in a publication of reasonable size that may include special feature and guest contributions not currently in the Journal.

Our web page has some new entries including a list of our Honorary members, and a reprint of some articles from our last newsletter: Our policy on registration/accreditation of practising meteorologists (in an attempt to maintain quality standards) and our reaction to the Government's decision in its 1999/2000 budget to scope MetService for possible sale.

This newsletter contains some interesting insights into the live and times of our latest honorary member, Dr. John Gabites, forecasting weather in South Pacific during WW2. And there is a thought provoking article from Jolyon Manning who lives in Alexandra. Central Otago has had strange weather for the last 2 years, and is particularly sensitive to climate changes. Weather is a mix of pattern and chaos, and if we can find some explanation of the pattern from the behaviour of the sun then this is worthy of study, provided the search for understanding is done in terms of honest science.

Bob McDavitt, 5 March 2000, mcdavitt@met.co.nz

REPORTS FROM THE BRANCHES : Auckland

On Monday 14 February Sir John Houghton held a public lecture at the ARC chambers in Vodaphone house on **The Science of Climate Change.** Auckland Met Soc. members were specially invited and about a dozen were able to attend. Sir John Houghton was in Auckland as co-chair of the IPCC working Group 1 author review workshop. This is an important step towards the next report from IPCC which is expected to be finalised in 2001.

Sir John commented that the IPCC's aim is to try and mitigate the damage of climate change, and to explain the uncertainties as far as we can grasp them. It only concentrates on possible trends within a human lifetime, say 50 -100 years. Like any science it involves measurements and theories. Trends now indicate that air temperature bear the ground is now warming at a rate which is far faster than normal in the history of this planet. The equivalent of minus half an ice age in less than 100 years! A "substantial" part is due to pollutants from human activity (Co2 and CH4) CO2 is now 365 ppm.

Climate variability brings vulnerability, and sea level rise is currently at the rate of 1/2m per century. 150 million people (= to half the US pop) currently live below the 1 metre contour (20m in Bangladesh alone but also a few thousand spread around atolls in the Pacific). So a major problem in the 21st century will be these refugees of coastal flooding. Also water will become such a scarce resource (like oil is now) that it will be a likely trigger to future wars. It isn't all bad news, a warmer climate will mean that Canada and Russia will become the bread growers of the new world, mid latitude nations will still grow their own food. Its just that the tropical rain seasons will get wetter and subtropical dry areas will get drier.

The estimated cost of unlimited global warming is about 5% of GNP, and the cost to act now is less than 1% of GNP. The most effective things the planet needs is for us to limit deforestation, save energy, and change from fossil fuel to renewable energy. The recommendations from IPCC are merely that we all do a bit better to reduce the pollutants. As for methane CH4, the estimates are that 30 to 50% of the Siberian pipeline is currently leaking into the air. So for Russia, some maintenance will do the world of good. As for NZ, some work on energy efficacy can rapidly reduce the amount of pollutants we disperse AND act as an economic spurt to our development. The idea (Rio 1992) is to stabilise CO2 to a level consistent with sustainable development (this still means an atmosphere at 400 or 450 ppm Co2) The spread of disease is not touched by this working group, but could well be our main motivating factor in 10 years time (a death threat is a great motivator).

Sir John commented that there are always going to be some backlash for some folk who feel most comfortable if nothing needs to be done. These people usually get their ideas published in the popular press and can always find some selective evidence to support their arguments. IPCC takes an overall viewpoint looking at all the evidence, which is why the working group have flown all round the world to Auckland this week.

We know what to do but lack the will to do it - this is a spiritual problem. Sir John takes the optimistic view that global warming offers us all an opportunity to 'Make a Difference", to show others what is possible. Nothing will happen useless we all do our bit. Several questions for the public highlighted other problems such as traffic (a problem close to an Aucklander's heart) and Sir John admitted the work of the IPCC overlaps with many other areas. There need not be any forcing: we don't yet have to be so radical as to stop people from travelling , we just need to promote efficiency.
It is a welcoming response to this public lecture that The New Zealand Government announced the next day that it will be reviewing its energy efficiency programs.

Bob McDavitt, February 2000, mcdavitt@met.co.nz

Wairarapa Weather Watchers

Meeting held on 14 February dealing with the history of satellite observations. Membership is still at 37, 1 member has passed away and a new member has joined.

Alex Neale, aanea@winz.co.nz

Wellington Branch

Speakers that are being lined up include:

John Crouch on America's Cup forecasting
Augie Auer
Jamie Schlumeister
Hamish McGowan
Brett Mullan
And Erick Brenstrum

Vice President, Erick Brenstrum, Erick.Brenstrum@met.co.nz

Canterbury Branch

1) Fresh Perspectives Conference organization continues to trundle along.

2) Little progress has been made on arranging this years Met Society Meetings at the University; mostly because the VP is away until the end of March. Some help is being organised from the secretary of the recently established Centre for Atmospheric Research so that we should have our first meeting for the year in early April.

Vice president, Don Grainger r.grainger@phys.canterbury.ac.nz

Snippet from last Committee meeting

At the committee meeting held on 27 Jan 2000 it was agreed to send a letter of congratulations to The Royal Meteorological Society in the UK who will be celebrating their 150th anniversary in April 2000.

Feedback still wanted

The committee are still seeking feedback from all members as to our position statement and policy on the topic of the role of the

state in meteorology. This position statement is being widened to include issues such as the quality of those practising meteorology and climatology in New Zealand. There is no set minimum standard at this stage ty control and several ethical issues are slowly arising. So please check out the proposed document at **http://metsoc.rsnz.govt.nz/policy.html** or call us for a postal copy from (09) 377 4831.

Recent dramatic weather events in Central Otago:

Some personal observations on critical climatic thresholds and solar cycles - Jolyon Manning (Jolendale Park, Alexandra, Jan 2000)

What an extraordinary difference between last summer and this. Last summer (1998/9) we had two very dry and HOT months November 6mm and February 4mm. This summer (1999/2000) we had two very wet months: November 92mm and January 117mm - by far the wettest in 78 years of records. February 1999 was our hottest month with 14 days 30C or more (up to 37C) - more like Adelaide, Sydney or Brisbane. But for much of the recent summer we recorded average daily 'highs' more than 7C BELOW the comparable daily highs registered last year. Consequently there have been spectacular changes in the local landscapes with prolific growth and flowering of field flowers and no doubt the sweet briar and wilding pines will have had a great season in the absence of big rabbit populations that used to make such a difference here.

In a lifetime of close observation as an amateur climate enthusiast I cannot recall a period of such dramatic contrasts as we have experienced since about 1988.

1988: In mid-May 1988 (6 weeks after cyclone BOLA) Central Otago experienced a heavy snowfall following a late 'Indian summer'. With unimpeded outbound radiation the mean temperature in May fell abruptly from 10C to -2C with daytime temperatures in the second half of that month falling close to zero. There were spectacular losses of adult conifer trees in the district following such a seasonal shock to transpiration processes.

1991-2: There were spectacular cold winter months in July 1991 with 7 'ice days' in Clyde, and June 1992 with 6 'ice days - the coldest month in Central Otago for at least 64 years.

Mid and late 90s floods: Then there were the now famous Clutha floods - January 1994 with a monthly rainfall total of 133mm at Clyde, December 1995 with 129mm at Clyde, and November 1999 with 137mm at Clyde. The resultant damage in Queenstown, Wanaka, and Alexandra is now well known. Damage in the latest event is now costed by insurance companies as in excess of $50 million (worse than 'BOLA'). The widespread mountainside scars from a 4-day 400mm+ rain event are of a magnitude not seen in a lifetime.

1997-9 the 20-month drought that culminated in February 1999 with spectacular and extensive countryside fires around of Alexandra over an area equal to all other rural fires throughout New Zealand last year, was notable for a couple of mild and dry late winters, a virtual absence in the heart of Central of rainfall events in excess of 12.5mm (half an inch) and a particularly windy period in November/December 1997.

Alexandra still holds the 12-month drought record for New Zealand which occurred back in 1963/64 with a miserable 137mm recorded at that time. And nearby Ophir is still the coldest place in New Zealand, its earlier record back in forties being exceeded once again in the mid-nineties.

There have been other spectacular 'events' such as the very intense flash flood at Coal Creek (Roxburgh) a few years ago, isolated hail storms and December rains that in two successive years rendered uneconomic the big cherry orchards devastated by split fruit close to harvest. My interest in these 'critical climate threshold values' dates back to my reading of the 1961 UNESCO (Rome) 'symposium on climate change' and in particular to a paper delivered by L P Smith. It is salutary to note that the interest in now much discussed ENSO events goes back to the times of Dr Kidson and featured prominently in the 1961 UNESCO conference.

Semi-arid places are more sensitive to minor climate changes, especially so when the events occur in close succession. Our park is located in the driest ecological district in New Zealand and thus is well placed to measure 'critical climate thresholds'.

Summing up recent events in Central Otago:
The critical role of anti-cyclonic 'blocking highs' has been highlighted in the past decade. In our part of the world we are more normally accustomed to the progression of big lows to the south and a regular cycle of troughs and fronts - depending on the orientation some of those fronts can be 'dry' drought sustaining events that bring dismal wind and no rain to Central.

The big flood events seem to invariably have a trailing edge of a big slow-moving 'high' in the picture. During the November flood event (with its 4-day rainfall of 'heavy drops') we could often see on the northeastern horizon a slither of blue sky and the resultant rainfall figures disclosed a remarkable sharp edge to the big rains.

Extreme events appear to be rather short-lived and highlight greater volatility. The occurrence of severe late season frosts in Central Otago which have been characteristic of the district seem to have waned somewhat. We have had several notably mild winters despite the occurrence of cold months described above. Weather-wise it has been a good time to introduce Pinot Noir cool-climate grapes to these southern districts. 'Degree Days' are now a familiar aspect of real estate business with Bannockburn emerging as the wine capital of Central Otago.

Big improvements in horticultural weather insulation technologies and domestic living arrangements have disguised some of the more adverse affects of extreme climatic events in our time. Landscape modification however with earlier over-grazing (sheep and rabbits

etc.) and removal of tree cover on erosion prone mountain slopes has increased flooding risk. The Clutha - the largest river in New Zealand - peaked at 3600 cumecs through the Roxburgh Dam structure recently - that can be equated in total weight of water flow to six large freight trains passing through the dam EVERY SECOND. And the probable maximum flood event is now put at something over 9000 cumecs. Can anyone really comprehend the potential disaster that could overtake the Clutha Valley in an extreme weather event and mountain snowmelt?

Solar Cycles and Climate Trends:

My lifetime interest in this matter is well known. Those of you who were fortunate enough to see the recent BBC television documentary series titled 'The Planets' will no doubt like myself have been especially interested in the segment that examined the unfolding mysteries of the Sun - including the presence of the well known sunspots. I have long assumed that the sunspots themselves were an 'indicator' of more impressive forces at work - variations in coronal outbursts and the operation of the solar winds.

We are currently within the peak of the latest 11 year sunspot cycle (No. 23). Indications to date suggest that the vigour of activity, although quite spiky, will be lower than the average for the past 5 cycles which have been well above the mean for the 23 cycles observed since Galileo. The interesting thing is that the Maunder Minimum (early 1700s when there was an unusually 'quiet sun') coincided with the last 'mini' ice age on Planet Earth. The consistent vigour of recent cycles would appear to be consistent with global warming.

I publicly predicted the enhanced risk of a big Clutha flood event in the Otago Daily Times late in July 1999. I did this because of my earlier studies in the mid-Seventies of annual lake inflows and sunspot numbers from the Thirties employing data supplied to me by the NZ Electricity Department from their lake inflow records, and sunspot numbers from Zurich (Switzerland) and Boulder (USA). It seemed in particular that the known features of 1956-58, 1978-80 and the early experience of the 1999-2001 (double sunspot cycles) had much in common. And I think that the next 18 months could well see a further significant flooding event in the key Canterbury, Otago, and Southland watersheds. In 1957 there were sustained floods in the Clutha, and in the late Seventies the township of Kelson (West Otago Pomahaka catchment) was virtually flooded out of existence.

A discussion on these matters would not be complete without a word about the Clutha siltation/flooding problems. I believe that the upper catchments often formerly clothed in beech forests were burned in the past 1000 years, over-grazed by sheep, goats and rabbits, abused by the goldmining operations, and much of the so-called 'geological erosion' has in fact been man-induced. It is

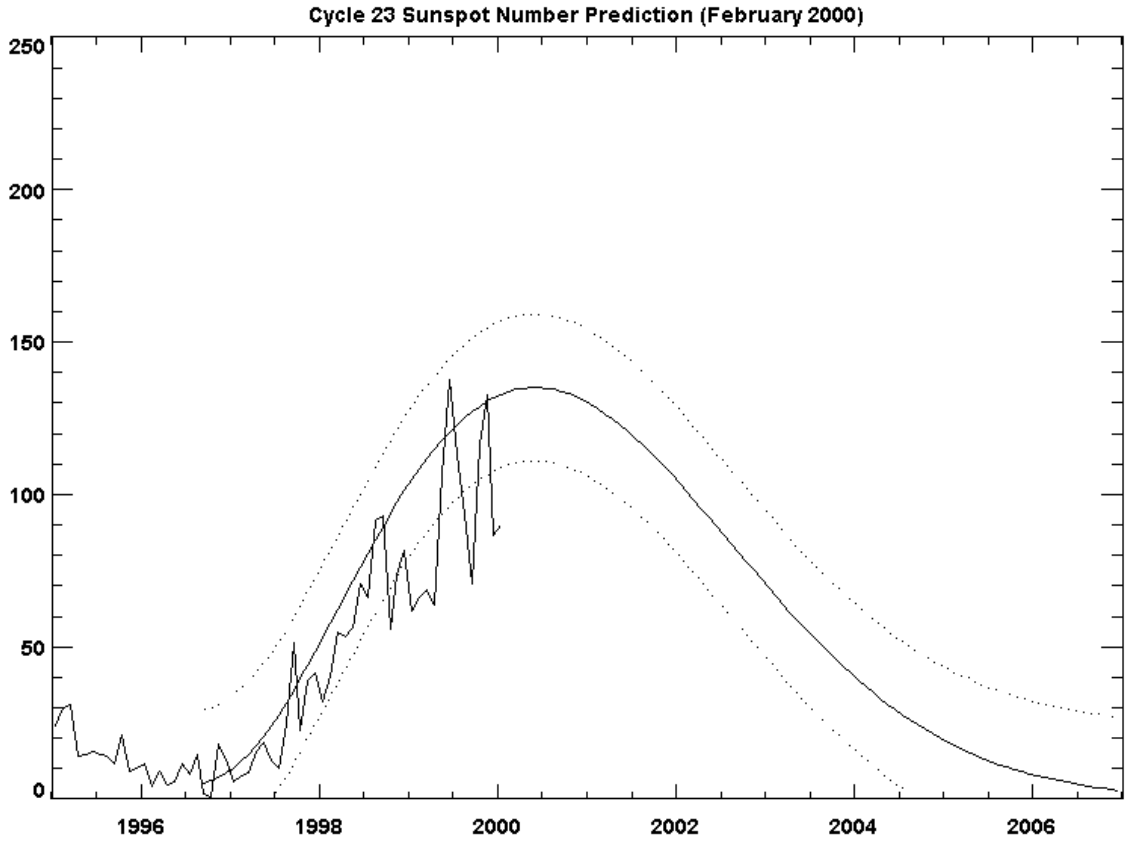
now time to be brave and set about tree-planting - I suggest with poplars and beech on the lower slopes in the Shotover etc. (Certainly not the troublesome *Pinus contorta* which can spread very rapidly and get out of control). I feel certain that the former Soil and Water Conservation Council would have taken important initiatives without undue delay. We have to be practical and sensible - a much bigger flood in the Clutha (and indeed for other large South Island rivers) cannot be ruled out.

I am most grateful for the encouragement over the years of John Maunder, Alaric Tomlinson and Brett Mullan for their personal support of my time-consuming enquires. Also, can I warmly commend a most excellent study by Dr Patrick Grant ("Hawke's Bay forests during the past 1000 years") and his evidence for 200-year exceptionally windy events. I think we tend to under-estimate the importance of wind in dealing with critical climate threshold values - the summer-time on-shore 'barbecue breaker' is a serious factor at Jolendale Park.

Finally, I would like to commend a couple of interesting and provocative web sites:

- **http://www.SunspotCycle.com**

Note the significant upward spiking of sunspot numbers ….and observed flares… early in November - some days prior to the record 4-day flood event in the Upper Clutha/Wakatipu Basin catchments.



- **http://www.vision.net.au/~daly/guests.htm**

In particular the paper by Dr Theodor Landscheidt (Nova Scotia Institute on Solar Cycles - formerly from NASA, Colorado) 'Top Climate Events' Linked to Solar Motion Cycle' (3 January 2000) and the discussion and response papers at end of this very interesting paper by Richard Courtney and Charles F Keller, (Inst. Geophysics and Planetary Physics, University of California National Laboratory, Los Alamos, New Mexico (USA).

An open Internet website provides an opportunity for informed scientists to respond immediately without having to get 'peer review' sanction prior to publication. Both my wife (Dr Enny Manning, who has a lifetime experience in getting hypertension research findings published in The Lancet, etc. arising from her eminent and pioneer work with worldwide clinical trials with drug therapy to manage high blood pressure) and I were very impressed with the arguments presented this way.

Dr Landscheidt has established a link between the 11-year cycles (and critical 'placements' within those cycles) and the onset of El Nino and La Nina events. He has noted that (a) the current sunspot cycle is proving much less vigorous than the expert international panel of solar observers predicted about 4 years ago, and (b) it does look as if the succession of above average sunspot number cycles since the Thirties might be on the wane now. His response to Chuck Keller is worth quoting:***"…the eruptional activity on the Sun … is the main factor. It has NEVER been as weak since the beginning of flare observations in the thirties. If the Sun's eruptional activity and its effect on the solar wind are as important for climate change as I have been emphasising for decades, you have to expect cooler climate. If the weakness continues, it will accelerate the decrease in temperature I have predicted for the coming decades on the basis of cycles of eruptional activity on the Sun***".

It is important to understand that variations in solar cycles are much more significant in terms of their impact on global temperatures than the CO2 and associated 'green gases' variations. I understand that a doubling of the CO2 in the atmosphere in the current century would equate with only a variation on the sun's emissions of 0.2 of one percent. Intuitively I have a feeling that 1998 may prove to be a short term peak in global surface temperatures. And a big volcanic eruption could hasten the reversal. If this were the case the marked volatility we have experienced in weather 'events' in the past decade or so may soon taper off. This would make a huge difference to horticultural strategies now being promoted in many places …especially those where crops are running close to critical climatic threshold values - particularly semi-arid places such as Jolendale Park.

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