

# *Kārearea*

## *Protecting a southern land*



Image: Craig McKenzie

Feb–March 2018



Forest life at Papatowai



Catlins Estuary birds



Penguin conservation at the Nuggets

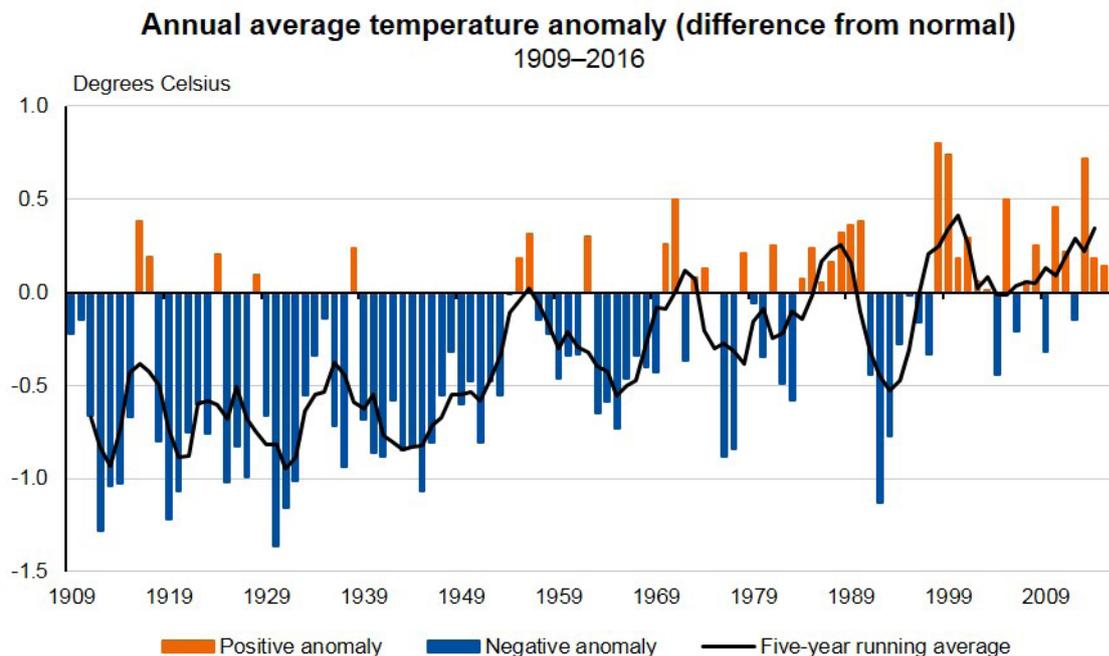


Fossils at Papatowai

# Catlins Summer Programme 2018

# "But it's just a natural cycle ..."

Jane Young



Source: NIWA

**A**fter living for decades in the Catlins it came as a bit of a shock this summer to find myself moaning about high temperatures and lack of rainfall. Even the locals – and you’ve got to live here for much longer than 30 years to be considered a local – acknowledged that this was one of the warmest summers they could remember. Then on 02 Feb, amidst storms, floods and fires, NIWA announced that January had been the hottest New Zealand month during the 108 years for which we have reliable records. Of course one record-breaking summer doesn’t ‘prove’ climate change; it’s the trend that matters. And when we look at the trend, it’s just getting hotter and hotter.

Even when people concede that the climate is in fact changing, they are often still reluctant to accept that human activities are the cause. Conversations tend to be along the lines of: ‘I remember summers that were this hot when I was a boy. It’s just a natural cycle.’

It’s hard not to respond by throwing facts at people in the hopes that this will make them instantly see the light and decide to bike to work, eat less meat, plant lots of trees, etc. And, most importantly, push for change at corporate and government levels.

Social scientists debate whether climate change facts can change people’s minds or just make them hang on more tenaciously to their existing viewpoint. I’ve been reading a fascinating book by George Marshall: *Don’t even think about it: why our brains are wired to ignore climate change*, which delves into all the reasons why it’s so hard for us to accept the reality of what’s happening. Nevertheless, because some of the arguments used to justify lack of action appear at first glance to sound quite reasonable, we need to be clear about the facts.

## **Claim 1: It’s all caused by the sun.**

It’s certainly true that changes in solar activity can affect earth’s climate. The cooler period in the Northern Hemisphere known as the ‘Little Ice Age’, which lasted from the 16th to the mid 19th centuries, was caused by a number of factors, but the main one was the occurrence of two periods in which solar activity was lower than any other period in at least the previous thousand years. In the mid 1800s a period of increased solar activity brought the Little Ice Age to an end. Human industrial and agricultural activities were already increasing the amount of greenhouse gases in the atmosphere, but it wasn’t until about the 1970s that anthropogenic (human-caused) activity outweighed the natural ‘forcings’. For the last three decades the sun’s output has been slowly decreasing (*not* increasing) but again, any cooling effect is being more than counteracted by human activities as we continue to destroy forests and burn fossil fuels.

## **Claim 2: Volcanoes are responsible – they put out far more CO<sub>2</sub> than humans do.**

Volcanoes tend to have a short-term *cooling* affect on the climate. During the Little Ice Age there was a stretch of increased volcanic activity which brought about an increase of dust and sulfate aerosols in the atmosphere. Just like the aerosols caused by industrial pollution, they have a cooling effect because they scatter sunlight. Similarly, after the 1991 Pinatubo eruption there was an overall cooling in the lower atmosphere. (One especially hair-brained idea for ‘fixing’ global warming is to deliberately pump aerosols into the atmosphere to try and cool things down. Acid rain, anyone?)

According to the US Geological Survey, the world’s

volcanoes generate about 200 million tonnes of CO<sub>2</sub> a year. That sounds a lot, but is less than one per cent of the 24 billion tonnes put out by cars and industry. In 2016, the manufacture of cement alone added 1,450 million tonnes of CO<sub>2</sub> to the atmosphere.

**Claim 3: It's getting hotter because of changes in the earth's orbit.**

For the last 2.6 million years the earth has been in a long-term ice age. During this time there's been a pattern of glacial periods lasting for 100,000 years or so, punctuated by inter-glacials, lasting on average for about 11,500 years. Human agriculture and civilisation developed in the 'Goldilocks' period of the current interglacial, which began about 11,000 years ago.

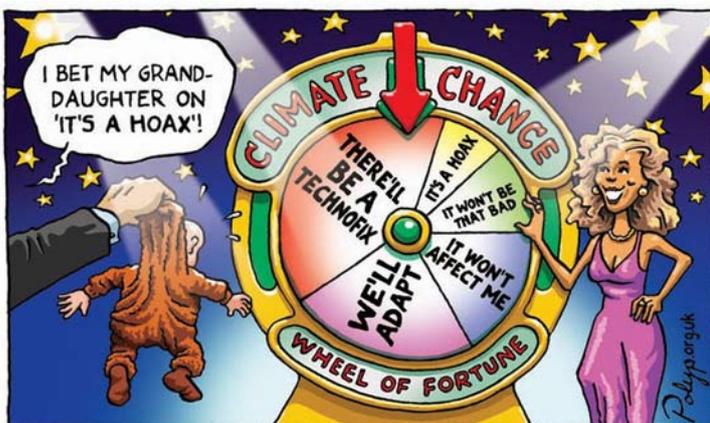
This glacial-interglacial pattern is driven largely by the effect of the Milankovitch cycles on the amount of sunlight hitting the northern hemisphere (it has more land mass than the southern hemisphere so its temperature changes more quickly). These cycles result from the earth's orbit becoming more or less elliptical, the earth's tilt changing, and the earth wobbling on its axis of rotation. They aren't as regular as a pendulum swinging back and forth – for example, some geologists believe it's likely that the current interglacial will last longer than average.

At present we're at the stage when we'd expect the earth to be in a weak cooling phase, but this natural trend is being far outweighed by the warming effect of the greenhouse gases we're pumping out into the atmosphere. Consequently, most of the world's ice cover is actually retreating, and at an ever-increasing rate.

**Claim 4: There's no link between CO<sub>2</sub> and changes in global temperature.**

When we look at ice-core data there is often a pattern in which CO<sub>2</sub> changes lag hundreds of years behind the temperature starting to warm. Surely it should be the other way round?

At the point in the natural ice age cycle when polar ice warms up and melts, the influx of freshwater into the oceans disrupts water circulation patterns. Because gases are less soluble in warm water than in cold, as the massive Southern Ocean warms up it expels some of its dissolved carbon dioxide into the atmosphere where the gas traps more heat energy and sets up a positive feedback loop. So in this case carbon dioxide doesn't cause the initial warming – that's due to changes in the earth's orbit – but it reinforces the trend and is eventually responsible for most of the total warming.



www.polyp.org.uk

**Climate forcings** are the different factors that affect the Earth's climate. They drive or 'force' the climate system to change. Forcings can be positive (causing the earth to warm up) or negative. Forcings are natural and/or anthropogenic (caused by human activity). They include changes in:

- Energy output of the sun
  - Earth's orbital state
  - Volcanic activity and plate tectonics (movement of the earth's crust)
  - Land use, eg amount of forest
  - Greenhouse gases in the atmosphere
  - Aerosols and dust
  - Surface reflectivity (albedo)
- At any one time the overall forcing (aka radiative forcing) will be the sum of all the individual forcings.

**NB** A forcing effect isn't the same as feed-back. For example if the earth cools because it's getting less energy from the sun, that's a negative forcing. As more ice is formed and reflects more heat back into space, the earth will cool further. That's a positive feedback loop. Sort of, the more you get (in this case, cooling) the more you get.

**Claim 5: There's no point in trying to reduce CO<sub>2</sub> emissions – water vapour is a much stronger greenhouse gas than CO<sub>2</sub>.**

When I drove into town this morning, the main greenhouse gases my car was adding to the atmosphere were carbon dioxide and water vapour. The CO<sub>2</sub> is likely to stay there, trapping heat, for years or even centuries until it becomes part of a biological cycle; or dissolves in water, causing the water to become more acid; or is removed by slow geological processes.

For the water vapour it's a different story. At any given temperature the atmosphere can only hold a certain amount of water vapour. As soon as the temperature falls, any excess vapour will condense and turn back into a liquid. When the temperature rises, more water will evaporate until the air becomes saturated again. This means that long term, the global warming caused by humans flooding the atmosphere with CO<sub>2</sub>, will result in a steady increase in the amount of water vapour that the the air can hold. The more heat trapped in the atmosphere, the more water vapour; the more water vapour, the more heat.

In other words, water vapour acts as a feedback not as a forcing – it amplifies the heating effect of other greenhouse gases, but is a follower, not a trend-setter. ■

**For more responses** to sceptical statements about climate change, see *How to change minds about our changing climate* by Seth B Darling and Douglas L Sisterson or <https://skepticalscience.com/>.

There's a good video on Bernie Sanders facebook page in which actual climate scientists answer questions posed by the woefully ignorant Kathleen Hartnett, Trump's choice to lead the White House on environmental policy: <https://www.facebook.com/senatorsanders/videos/10156723085332908/>

# Penguin and predator news from Te Rere Reserve

## Jenny Campbell talks to Brian Rance about the results of the latest bird counts

**T**he endangered yellow-eyed penguin numbers at Southland Forest and Bird's (F&B's) Te Rere Private Scientific Reserve in the Catlins continue to concern F&B members who have been providing predator control and native plantings for nesting shelter for these secretive birds for over 25 years.

The annual count was undertaken on 09 December by two groups of five committed F&B members, who continue this work to keep a check on what is happening to the population there. The first team of five set off from Invercargill at 8.30am, arriving at the isolated site on the rocky east coast about 10.30am. Another team came in to take over at 4pm and stayed until after 10pm.

"Two regular sites are used to count the penguins making a return to their nest in the undergrowth, bringing back food they have gathered at sea for the chicks," Southland F&B yellow-eyed penguin advisory group member, Brian Rance said. "The adult bird pairs share duties taking turns to go out to sea for food. The number of adult birds coming in or leaving after a changeover of duties during the day, is taken as the best estimate of the adult numbers at the site. From the results of this count day we could estimate 31 adults compared with 37 present last year, and down from 49 the previous year. This figure has varied from 46 to 66 over the last 8 years, down from the highs of over 70



Jenny Campbell

adults which had shown recovery after the disastrous 1995 fire."

This supports the belief that there is a moderate decline in adult numbers at Te Rere. Only 10 nests have been found so far this year, down from 14 last year.

"The adult birds and chicks observed on the count day generally appeared in good condition," Rance said. "I checked the trap lines and found one dead stoat and three rats so we need to keep up this regular pest control, with another group going in next weekend to put in more trap lines.

"The big unknown is at sea with predation and warmer temperatures affecting the penguin numbers but we hope this special breeding colony can support more of these unique birds. Based on the nest search

information, this year's penguin numbers are not expected to rise because of all the challenges the birds have to cope with.

"After a poor season last year it is hoped the chicks found there this season will be able to fledge, and then come back to this site to nest themselves after about three years, so helping to increase numbers," Rance said. "One group of counters could not access the bird hide as a pair of penguins had taken up residence and were raising two healthy chicks in it, which is very enterprising." ■



Fergus Sutherland

## And Fergus Sutherland introduces the Squawk Squad



**P**est control at the Forest and Bird Society's penguin reserve at Te Rere in Southland just took a giant leap forward. Four rat and stoat traps were installed at the reserve soon after the first two hectares were fenced in 1982. The reserve is now 70 hectares in size and by 2017 trap numbers had increased to fifty, including eight automatic traps. These traps were catching an average of thirty rats and stoats per year and helping to protect the 40 yellow-eyed penguins living and breeding at Te Rere.

With the help of an innovative organisation called Squawk Squad, the trap numbers were increased by a further seventy automatic traps this summer. Traps now completely surround the reserve at 50 metre spacings – the optimum spacing for rat control. What's more, these new traps are linked by radio to provide instantaneous information on catches. Squawk Squad decided to help at Te Rere after successfully installing its first network at Ark in the Park in Auckland. Under their scheme, Squawk Squad seeks donations for traps for a project and people who donate get feedback on the success of the traps. Many people have contributed, ranging from individuals to school groups. The day after the installation of the traps at Te Rere they were recording kills.

Contacts: Squawk Squad, Te Rere Reserve  
You tube video of trap installation

## The Catlins Summer Programme

### *Mohua at the Wisp*



#### Where and how to find Mohua (Yellow-head)

Mohua are a little larger than house sparrows, with rounded bodies, relatively large heads, strong bills and longish black legs with stout claws – well adapted to their insect and spider foraging. The head and front of the male Mohua is golden yellow – brilliant in sunlight. The female and juveniles are also yellow but browner on top of their heads and backs.

The Catlins is one of the last strongholds of this rare South Island native bird. They are confined to the beech forest in the north-western part of the Rainforest Park. The best place to look is along the Catlins river track, between Frank's Stream and The Wisp. During the breeding season (Nov–Jan), the birds take up nesting territories and the male territorial call at this time is a loud descending whistle. Tzu, tzu, tzuuuuuuuuu.... The female has a buzzzz call, while all birds produce a busy silvery chatter at all times of the year.



Cat at a tītī nest



Pest Summit report

## Southern Events

**Thurs 08 Feb 1pm South Otago Forest & Bird  
Wild at the Wisp**

Share **Pen Gillette's** passion for lichens, fungi & birds on a walk into the top end of the Tawanui River Walk. Meet at Owaka Museum.



**Fri 09 Feb South Otago Forest & Bird  
7.30pm New Zealand bat talk  
9.30pm Bat spotting at Tawanui**

**Catriona Gower**  
Owaka Community Centre



**Wed 14 Feb 7.30pm South Otago Forest & Bird  
Fossils of the South**

**Daphne Lee from Otago University**  
Owaka Community Centre



**Sun 25 Feb/ Sun 25 March 1pm  
South Otago Forest & Bird  
Weeding & revegetation at Otanomomo**



**Mon 26 Feb 7.30pm South Otago Forest & Bird  
Yellow-eyed penguins – going solo**

**Penguin researcher Mel Young**  
Owaka Community Centre



**Sat 03 March 10.30am South Otago Forest & Bird  
Stall at the Owaka Cavalcade Market**

Owaka Sports Ground



*Feathers and Wings*

A PHOTOGRAPHIC EXHIBITION by local photographer  
GLENDA REES

MID JANUARY TO MID APRIL 2018  
AT CROYDON AVIATION HERITAGE CENTRE  
MANDEVILLE (near Gore)



## Contact Details

### South Otago Forest & Bird

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### Coal Action Murihiku (CAM)

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### Conservation Volunteers Coastal Otago

[volunteerscoastalota@doc.govt.nz](mailto:volunteerscoastalota@doc.govt.nz)

### Yellow-eyed Penguin Trust

[www.yellow-eyedpenguin.org.nz](http://www.yellow-eyedpenguin.org.nz)

**New Zealand Sea Lion Trust** [www.sealiontrust.org.nz](http://www.sealiontrust.org.nz)

### *Kārearea: protecting a southern land*

Contributions welcome. Copy for April is due on 31 March.

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