

Climate change: problem or opportunity? ***Understanding climate change in the context of the Gospel***

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This is the text of part of an address given to the Synod of the Anglican Church in Tasmania on 2nd June, 2007 by **Mick Pope** of the Bureau of Meteorology, Melbourne and Fellow of ISCAST, and **Brian Edgar**, Professor of Theological Studies, Asbury Theological Seminary, Fellow of ISCAST. Parts A and C were written by Brian, Part B was written by Mick and Part D was a combined work.

Abstract:

Climate change is a social, ethical and theological issue as well as a scientific one. It needs to be understood in the context of God's purposes for the world. Scientifically, it is important that the world take steps to reduce human induced greenhouse gases, globally, 30 to 60% reductions on 2000 levels by 2050 to stabilise at under 3°. An ecologically sound spirituality of creation will address the issue of human consumption and the use of resources. It will also deal with the nature of our spiritual relationship to Christ and creation. Climate change has the potential to help us enhance our understanding of 'stewardship as self-control' and to enhance our ethical thinking by moving beyond tribal understandings of moral responsibility. This has implications for, amongst other things, our understanding of nationalism, politics and the relationship of developed and developing countries. Climate change inevitably locates us within the broad context of the history of the world and civilization and challenges us to take on a moral responsibility for future generations. It raises questions of the purpose and meaning of life, into which a Christian eschatology has the opportunity to speak.

Key words

Climate change, global warming, greenhouse gases, gospel, creation, ecology, stewardship, spirituality, ethics, eschatology, Christ.

Part A: Climate Change in Theological Context

1. Climate change and the church: this is a gospel issue

Climate change is just one of the many issues which ought to be of interest to Christians. But climate change is also different to most of the others because of the way in which it draws together so many different dimensions of life.

- This is not merely a *scientific* issue, it is also a *social* one.
- It is not only an *ethical* issue, but also a deeply *theological* one.

In fact, it is a global, political, ethical, philosophical, theological, social, environmental, spiritual and eschatological issue! Moreover, it requires us to understand the *past*, it has relevance for *today* and profound implications for the *future*!

And God is concerned about all of these things!

- God is interested in the way that climate change affects poor and developing countries even more than developed countries;
- God is concerned about the way we use electricity and consume natural resources;
- God is concerned about our economic systems;
- God is concerned about the environment;
- God is concerned about the future of the planet and future generations.

Altogether, *climate change is a gospel issue*. The gospel of Jesus Christ has something to say about all these areas separately and climate change as a whole. Climate change and our response to it need to be seen as gospel issues.

If we are to ask more precisely what it is that the gospel says about climate change we must begin by understanding both the *world* in which climate change takes place, and *humanity* (part of the cause as well as being affected by it) in relationship to Jesus Christ. Otherwise Christians will have nothing distinctive to say about climate change. And if we have nothing distinctive to say then we should keep silent and leave it to those who *do* have something distinctive to say.

Indeed, some people (both inside and outside the church) suggest that the church has no special knowledge and should not get involved - and should stick to things relating to the gospel! But that is a narrow view of what the gospel is about. It is precisely because of our understanding of the gospel that we do have something distinctive to say.

So what is this distinctive thing that we have to say?

2. Finding meaning (cosmic coherence) in Christ

We must not forget that God's creation (the world that is being affected by climate change) is important not only because it is made by God, but because through his existence as the incarnate Jesus Christ, God is actually *a part of* the world. He honoured the creation by his presence and sanctified it. This should remind of the importance God gives to the created order (the so-called 'natural world'). In fact, the cosmos, and humanity, find coherence (meaning and purpose) in Jesus Christ and *to the extent that we have not understood creation in relation to Christ we have not understood creation.*

Often, we are tempted to look at the world in a fragmented and utilitarian way. That is, the world is there simply for us to *use*. We might be aware that we are called to use it carefully, as God's stewards in the world. But even then we still view it in a utilitarian way — simply as a resource.

Of course, in one sense, this is very appropriate because humanity *is* the high point of creation (made in the image of God) and we have indeed been given the right to use the world and the responsibility to care for it. But this is only because of Christ in us. Humanity is the high point of creation only because Jesus is the New Adam, the perfect human, the one who lives in us. The incarnation is the only real reason for understanding humanity as uniquely important. *It is not for our own sake that we value the world or humanity but because of Jesus Christ who became part of creation by becoming human.*

This involvement with creation means that God is concerned with more than individuals. *The gospel is not only concerned with the salvation of individuals but with the redemption of the cosmos.*

As Paul says in Col. 1:17–20:

He is before all things, and in him all things hold together. And he is the head of the body, the church; he is the beginning and the firstborn from among the dead, so that in everything he might have the supremacy. For God was pleased to have all his fullness dwell in him, and through him to reconcile to himself all things, whether things on earth or things in heaven, by making peace through his blood, shed on the cross.

A verse such as Eph. 2:8–9, 'For it is by grace you have been saved, through faith...' which is vitally important in speaking about *individual* salvation needs to be understood in the light of Eph. 1:10 which speaks about the reconciliation of *all things*:

And he made known to us the mystery of his will according to his good pleasure, which he purposed in Christ, to be put into effect when the times will have reached their fulfillment—to bring all things in heaven and on earth together under one head, even Christ.

In 2 Cor. 5:17–21 we find '...in Christ there is a new creation'.

We are part of a renewed creation:

Therefore, if anyone is in Christ, he is a new creation; the old has gone, the new has come!

And in Rom. 8:20–21:

The creation waits in eager expectation for the sons of God to be revealed. For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it, in hope that the creation itself will be liberated from its bondage to decay and brought into the glorious freedom of the children of God....We know that the whole creation has been groaning as in the pains of childbirth right up to the present time.

In other words it is the same God who cares about:

- renewal of *individuals*,
- renewal of the *church*,
- renewal of *society*, and the
- renewal of *creation*.

In God's plan, all these things are connected.

3. It is an opportunity as well as a problem

Climate change is undoubtedly a global *problem*. In many ways it is a threat:

- to the environment, ecosystems and biodiversity;
- as well as to human life, health and prosperity;
- and to social relationships, national integrity and political stability.

But can we shift from seeing climate change only as a problem, to seeing it also as a global *opportunity*?

Why is it an opportunity? Because it challenges many of our existing modes of thought and gives us an opportunity to us to re-visit and re-think many matters related to our Christian responsibilities.

- Climate change challenges our understanding of the nature of our responsibility to the global environment and the way that the world relates together as a community of nations and peoples - in politics and international relations.
- Climate change asks us whether the way we view ourselves a nation (or even perhaps, the way we see ourselves as a state) is helpful. Climate change questions modern nationalism.
- Climate change also gives us the opportunity to re-think the way we exercise our ethical responsibility in the world — which is very 'tribal'.
- With climate change we can re-evaluate the meaning of being stewards of God's creation and we can look again at the spiritual nature of our relationship with the world.
- Climate change asks serious questions not only about the extent of our consumption of the earth's resources, but it also about the spiritual meaning of our need to consume and live and travel as we do.

- It challenges our understanding of economics in relationship to the environment.
- Climate change also raises questions about the environmental, social and spiritual future of the world. In short, it raises questions about the nature of our hope and suggests that we should re-visit our understanding of the implications of believing in the gospel of Jesus Christ.

4. Understanding change in God's constantly changing creation

We understand creation:

- *Trinitarianly*: God's creative, dynamic relationship of love overflowed in the creation of the universe.
- *Doxologically*: we praise God for creation.
- *Dynamically*: the natural world is dynamic and it is not only the climate that is continually changing. The natural world is dynamic and the climate, like just about everything else, changes. It changes from day to day, from season to season, and from one era to another.
- *Cosmologically*, there are changes from the Big Bang through to today:
 - changes in galaxies and stars;
 - changes in species — emergence, change and loss;
 - at individual level everything from flowers to people grows, matures, decays and dies;
 - even cells in bodies;
 - birth gives way to death; without death there is no growth or development.

Can all change be reckoned to be bad, even when it means a serious dislocation with what went before?

Christians have, I think, a theology of creation, but not so much a theology of change, of loss, of death — of 'uncreation'.

In the same way that, for an individual, awareness of impending death, or some close escape from death, perhaps, can lead people to think deeply and differently about their own mortality, their life, and their ultimate purposes, so too climate change can help us think through, corporately, our understanding of the world.

How do we view change? Change is part of the life of the world and is not always negative: an ice age is no more or less morally right than a period of extreme heat; species come and go; birth gives way to death. These things happen in the providence of God. So, does this imply that we are not to be concerned about climate change?

Were it not for the role of humanity (as both cause and affected), if we stood on another planet, watching earth, much as we watch the sun and the stars, we might view the changes with an appreciation for the majesty of creation and the glory of God: Just as we look with awe at photos of

exploding stars. This is all part of a cosmic development.

But we cannot do that, we cannot be passive, not only because of our human involvement in *causing* them but also because:

- the human-induced dimension of climate change is now both undeniable and profoundly significant;
- the speed of human induced climate change is of great concern;
- we hold the present richness and biodiversity of the natural world to be a positive good and not lightly to be altered; and
- because the life, health and prosperity of the people of the world are intimately connected with the present, rich, and diverse form of the natural world.

We cannot be passive in the face of human-induced climate change.

Part B: The reality and the effect of anthropogenic climate change

The official body that makes judgements about climate change is the Intergovernmental Panel on Climate Change (IPCC). The IPCC was established in 1988 by two UN bodies, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), to evaluate the risk of climate change brought on by humans, based mainly on peer reviewed and published scientific/technical literature. The IPCC has now produced four assessment reports, which evaluate the recent and well established peer review science. The IPCC reports consist of many chapters, each with two lead authors, several contributing authors, and summarising hundreds of papers. There is also an accompanying technical summary and summary for policy makers. These reports are policy neutral, but do address areas that intersect with policy. There are three working groups, each with their corresponding reports. The three working groups are: the scientific basis, impacts, and mitigation.

Working Group I deals with three essential questions concerning:

- *Detection*: Is the climate warming? And the answer is 'yes'.
- *Attribution*: What is causing the warming? And the answer is that human activity is the largest contributor.
- *Projection*: What will the impacts be? And the answer is that it depends on what we do.

Detection

Evidence of global warming is now unequivocal. Figure 1 shows a reconstruction of global mean temperatures since 1850, known as the instrumental period — the time during which temperature has been measured directly using thermometers. The left hand axis of the figure shows whether a year is warmer or colder than the 1961–1990 period.

The right hand axis shows the estimated global mean temperature. The black dots indicate the annual mean, the blue line a smoothed series (time average) and the broader blue are the error bars. The coloured lines indicate a linear fit to the temperature changes. The lines indicate that not only is the temperature rising, but also it is rising at an accelerating rate. The total temperature increase from 1850–1899 to 2001–2005 is $0.76^{\circ}\text{C} \pm 0.19^{\circ}\text{C}$. The rate of warming averaged over the last 50 years ($0.13^{\circ}\text{C} \pm 0.03^{\circ}\text{C}$ per decade) is nearly twice that for the last 100 years. Eleven of the last 12 years (1995 to 2006) rank among the 12 warmest years on record since 1850. The planet is also warming at an accelerating rate. This is not due to the Urban Heat Island effect (the effect of the human built environment), which accounts for a mere $0.006^{\circ}\text{C} / \text{decade}$, and is only evident over land. The warming shown in the graph also occurs over the oceans. Paleoclimate data from ice cores, pollen records, tree ring data and corals show some uncertainties, but it is likely that the second half of 20th C was the warmest for past 1300 years, which includes the so-called Medieval Warm Period when Vikings colonized Greenland. The map (taken from the Bureau of Meteorology website) shows that most of Australia has warmed since 1910.

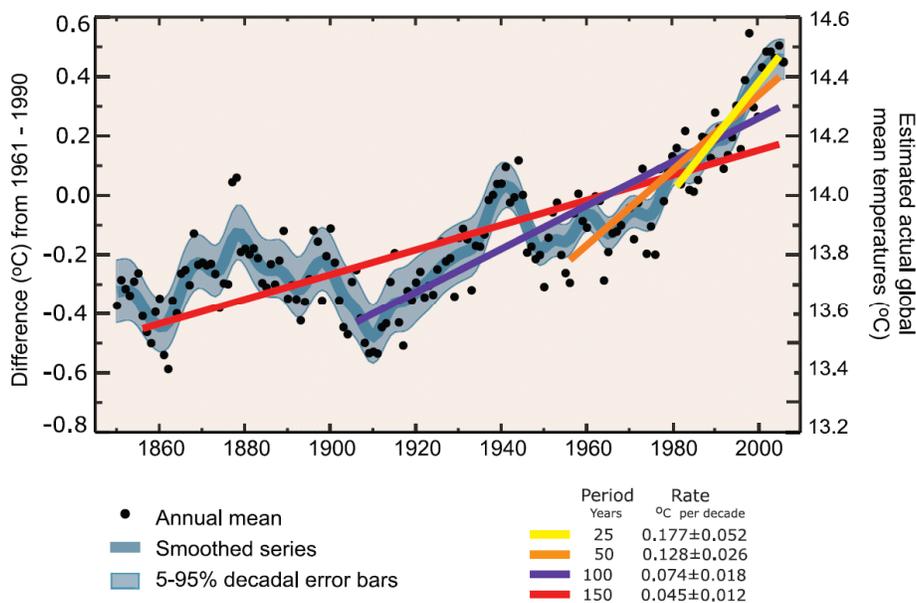


Figure 1. Troposphere from satellite records (right). Grey indicates areas with incomplete data. (Bottom) Annual global mean temperatures (black dots) with linear fits to the data. The left hand axis shows temperature anomalies relative to the 1961 to 1990 average and the right hand axis shows estimated actual temperatures, both in $^{\circ}\text{C}$. Linear trends are shown for the last 25 (yellow), 50 (orange), 100 (magenta) and 150 years (red). The smooth blue curve shows decadal variations (see Appendix 3.A), with the decadal 90% error range shown as a pale blue band about that line. The total temperature increase from the period 1850 to 1899 to the period 2001 to 2005 is $0.76^{\circ}\text{C} \pm 0.19^{\circ}\text{C}$. From the Working Group I Fourth IPCC Assessment Technical Summary. Figure TS.6.

The occurrence of heat waves is not directly attributable to global warming, but is consistent with it. Schar, C, et al., 2004: The Role of Increasing Temperature Variability in European Summer Heatwaves, *Nature*, **427**, 332-336, presented results from the 2003 European heat wave. An estimated 35,000–50,000 people died due to this event, complicated by political and sociological factors. Temperatures across Europe were up to 4°C warmer than the long-term average. When the temperature distributions were plotted for 1864–1923 and 1941–2000 were plotted, they show that the second period was warmer than the first. In a warming climate, heat waves will occur more frequently.

There are many other ways of detecting global warming, such as sea level rise due to expanding ocean waters, contracting ice sheets and glaciers, and changes in the behaviour of ecosystems (e.g. coral bleaching).

Attribution

Climate change has been occurring since the Earth was formed. Many 'natural' mechanisms affect climate under the providence of God. Changes in the parameters of the Earth's orbit and rotation, produce the so-called Milankovitch cycles, producing ice ages over large timescales (>11,000 yrs) via feedback with green house gases. The Earth's climate should be slowly cooling due to these orbital changes. Solar output varies weakly over time. Changes in solar output, combined with atmospheric feedbacks (changes in the location of pressure systems due to the so-called North Atlantic Oscillation) produced the so-called Little Ice Age in Europe. Volcanoes produce sulphur, which acts as an aerosol high in the stratosphere, reflecting solar radiation and cooling lower atmosphere. Changes in solar output and volcanic eruptions (Mt Pinatubo) produced the cooling observed during the 40s–70s.

The global oceanic circulation, known as the Global Conveyor Belt undergoes internal variations, giving rise to rapid climate change, with changes in a few decades. This circulation produces the Gulf Stream, making northern Europe and North America warmer than the equivalent latitudes in the Southern Hemisphere. Fresh water from melting ice sheets could lead to a weakening in the Conveyor Belt, although not as rapidly as the movie *The day after tomorrow* presents. Evidence that the Conveyor Belt is slowing down is not currently clear.

A Greenhouse Gas (GHG) is one that absorbs and re-emits the infrared radiation travelling upwards from the Earth. Naturally occurring carbon dioxide (CO₂) and water vapour keep the global average surface temperature above freezing. The plot shown in Figure 2 shows the concentration in CO₂ in parts per million for the last 20,000 years, with the right hand axis showing the equivalent radiative forcing that produces the observed temperature rise. The gray bar indicates the range of natural variability. What is clear is that over the past 150 years since the Industrial Revolution, CO₂ concentrations have increased sharply. This is in line with other GHGs like methane and nitrous oxide, although methane emissions have levelled out in recent years. Paleoclimate data shows that changes in orbital parameters have resulted in GHG feedbacks, increasing

temperature. Occasionally, catastrophic geological events like volcanic eruptions at the end of the Permian have resulted in increased GHGs and global warming. There is no other explanation for the present rise in GHGs than human activity, which matches the observed warming.

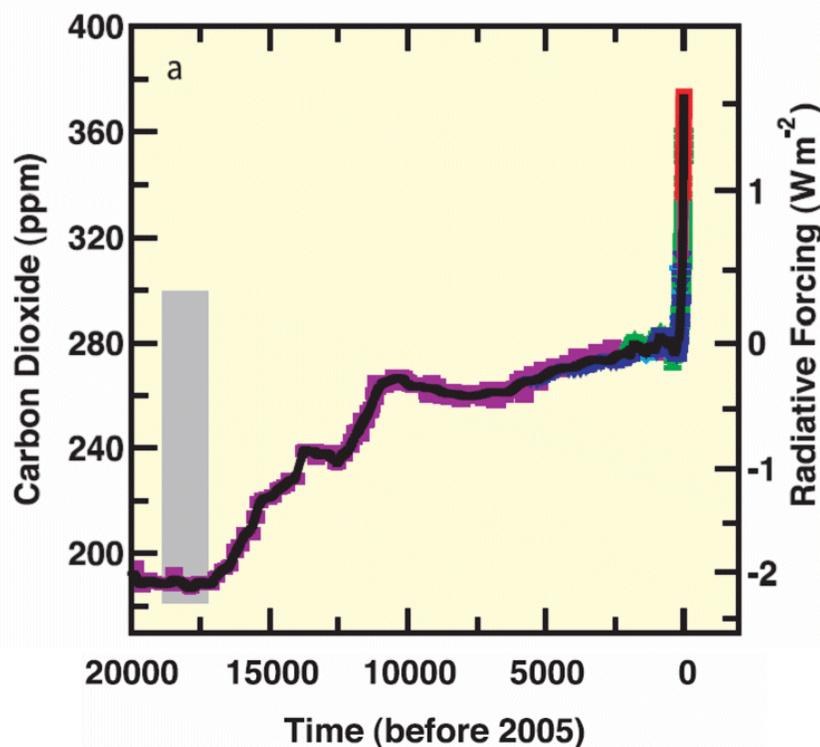


Figure 2. The concentrations and radiative forcing by carbon dioxide (CO_2) over the last 20,000 years reconstructed from Antarctic and Greenland ice and firn data (symbols) and direct atmospheric measurements (panels a,b,c, red lines). The grey bars show the reconstructed ranges of natural variability for the past 650,000 years. From the Working Group I Fourth IPCC Assessment Technical Summary. Figure TS.2.

The effect of greenhouse gases, changes to surface type (e.g. forest cleared for agriculture) etc., are expressed in terms of radiative forcing. For example, incoming solar radiation that is reflected by aerosols represents a negative radiative forcing, i.e. a cooling effect, whereas greenhouse gases absorbing and re-emitting heat energy (infrared radiation) represents a net positive radiative forcing, i.e. a warming effect. The understanding of anthropogenic warming and cooling influences on climate has improved since the Third Assessment report, leading to very high confidence that the effect of human activities since 1750 has been a net positive forcing of $+1.6$ ($+0.6$ to $+2.4$) W m^{-2} .

Figure 3 shows computer simulations of the 20th century climate, as represented by the global mean temperature. The black line indicates the observed global mean temperature. The lower shaded area represents all of the computer simulations that contain only natural forcing, including changes in solar output and the affect of aerosols due to volcanic eruptions. The upper shaded area shows the results for models that

include the effects of anthropogenic GHGs. What is clear is that the simulations that contain the best understanding to date of the physics of the atmosphere, but do not contain anthropogenic GHGs, cannot accurately reproduce 20th century temperatures.

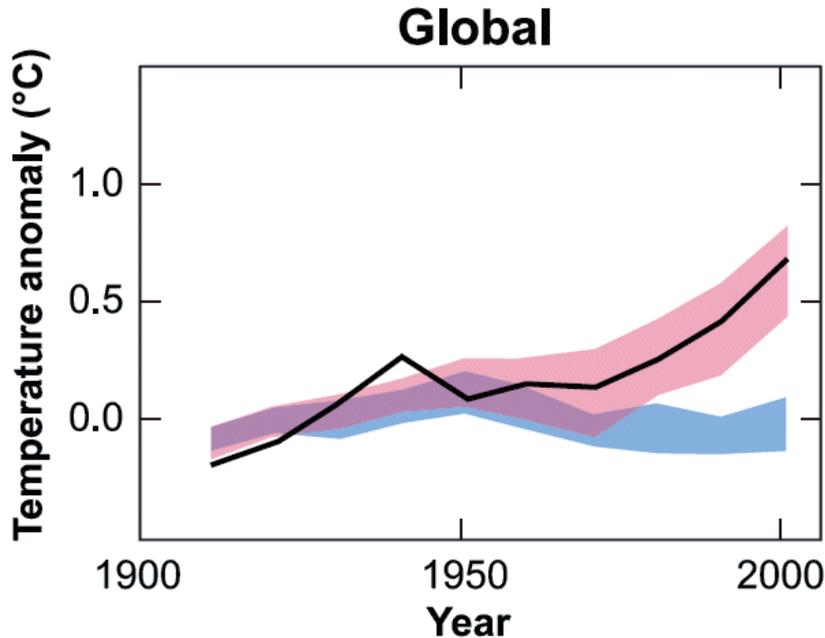


Figure 3. Comparison of observed global-scale changes in surface temperature with results simulated by climate models using natural and anthropogenic forcings. Decadal averages of observations are shown for the period 1906 to 2005 (black line) plotted against the centre of the decade and relative to the corresponding average for 1901 to 1950. Lines are dashed where spatial coverage is less than 50%. Blue shaded bands show the 5% to 95% range for 19 simulations from 5 climate models using only the natural forcings due to solar activity and volcanoes. Red shaded bands show the 5% to 95% range for 58 simulations from 14 climate models using both natural and anthropogenic forcings. From the Working Group I Fourth IPCC Assessment Technical Summary. Figure TS.22.

Projection

The business of foretelling the future is a complicated one. There are not only some uncertainties in the science (though these decrease with time). Future GHG emissions are the product of very complex dynamic systems, determined by driving forces such as demographic development, socioeconomic development, and technological change. Their future evolution is highly uncertain. Scenarios are alternative images of how the future might unfold and are an appropriate tool with which to analyse how driving forces may influence future emission outcomes and to assess the associated uncertainties.

Figure 4 shows the results of three scenarios from IPCC. The middle

scenario, A1B, represents very rapid economic growth, a global population that peaks mid-century and then declines thereafter, and the rapid introduction of new and more efficient technologies. There is a balance between fossil and non-fossil fuels. The A2 scenario (bottom of Figure 4) represents self-reliance and the preservation of local identities. Fertility patterns across regions converge very slowly. Economic development is regionally oriented and technological change is slow. Scenario B1 describes a world with the same population changes as A1, but with rapid changes in economic structures toward service and information, with reductions in material intensity, and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions. The scenarios all have similar patterns for 20 years from now, but the differences are much larger at the end of this century. What we do can make a difference for future generations.

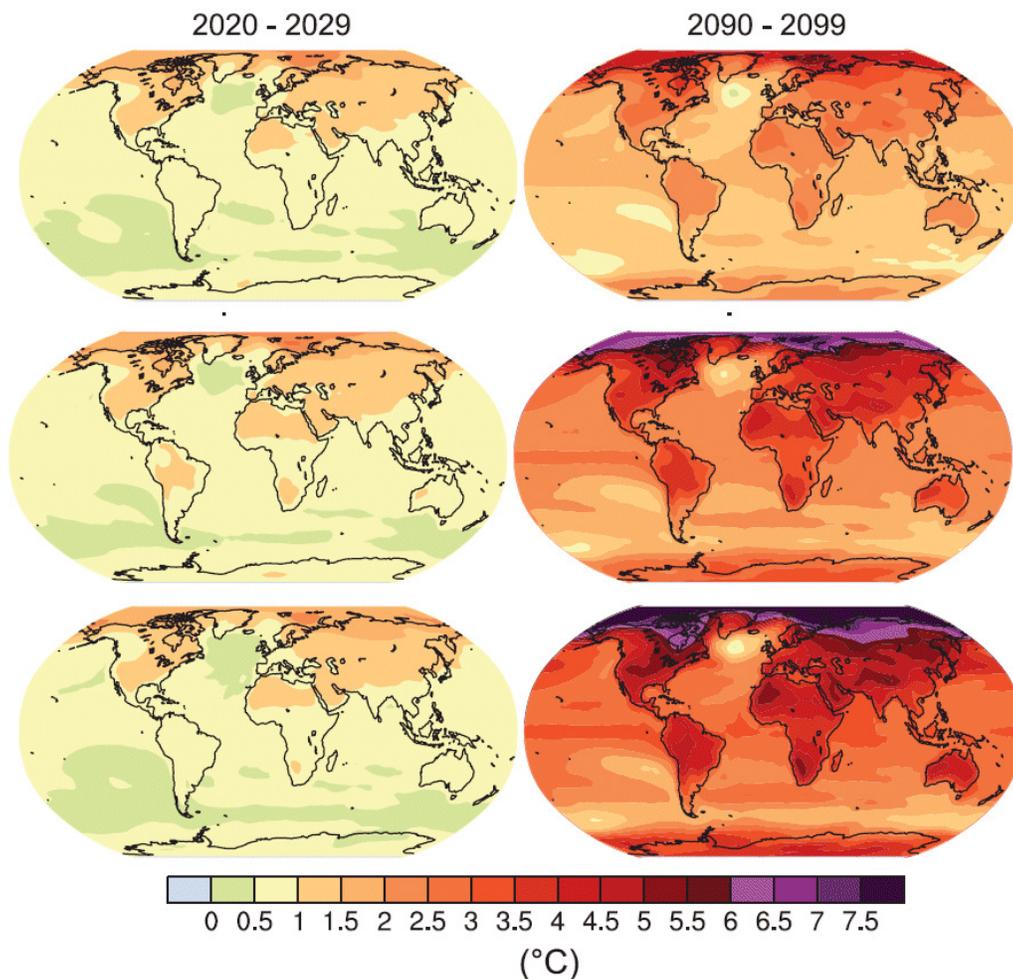


Figure 4. Projected surface temperature changes for the early and late 21st century relative to the period 1980 to 1999. The central and right panels show the AOGCM multi-model average projections ($^{\circ}\text{C}$) for the B1 (top), A1B (middle) and A2 (bottom) SRES scenarios averaged over the decades 2020 to 2029 (centre) and 2090 to 2099 (right). From the Working Group I Fourth IPCC Assessment Technical Summary. Figure

TS.28.

The rainfall results for scenario A1B (not shown) indicate that 90% of computer models agree that southern Australia will be 10% drier by the period 2090–2099.

Global warming will affect our Pacific neighbours via sea level rise. There is already evidence of this for the island nation of Tuvalu. Tuvalu consists of a series of coral atolls. Coral atolls develop when volcanoes form islands. Coral forms in the shallows surrounding the volcanic peaks. Eventually, erosion destroys the volcanic islands but leaves the coral behind. The atolls of Tuvalu lay only four metres above sea level. Rising sea levels have produced an increase in the incidence of large tides, known as king tides. Enhanced erosion due to these king tides has already made one of the islands uninhabitable. Furthermore, during high tides, seawater moves through the porous coral and wells up in the middle of the island. The salt water kills the local taro crops, with locals now having to grow it in tins.

A 10% reduction in average rainfall by 2050 will reduce the size of the fresh water lens that sits on top of the salt water table. For example, the Tarawa Atoll of Kiribati could see a reduction of 1/5. Sea level rise could reduce area of lens by $\sim 1/3$, also raising the water table level, leading to increased evaporation.

In the future, depending on scenario, end of century sea level rise is expected in the range 0.4–0.6 m. This rise excludes poorly constrained effects, such as enhanced outflow when ice shelves are removed from the end of glaciers due to calving, and melt water drainage lubricating ice sheet movement. An extra 0.1–0.2 m sea level rise is possible. Given what places like Tuvalu are already experiencing, the expected rises are significant. There is a lack of consensus on the impacts of global warming on tropical cyclone numbers and intensities. However, sea level rise will exacerbate the impacts of tropical cyclones on coastal locations.

Paul Epstein examined the impacts of present and future climate change on mosquito borne diseases (Epstein, P.R., et al. 1998: Biological and physical signs of climate change: Focus on mosquito-borne diseases, *Bulletin of the American Meteorological Society*, **79**, 409–417). Cold temperatures at high elevations in the tropics limit mosquito populations and the diseases they carry. Since the 1970s, the freezing level has raised by 150 metres and with it the height to which mosquitoes carrying malaria can reach. In 1997, malaria reached 2100 metres in West Papua and PNG, Dengue Fever to 1700 metres in Mexico and the responsible mosquito to 2200 metres in Columbia. Rising temperatures not only extend the range of mosquitoes, it also increases their activity (biting rates) and accelerates the life cycle of the Malarial parasite. By 2020, it is expected that the likelihood of contracting malaria will increase markedly in regions like the Northern Territory, Queensland, and the eastern coast of the USA. A third world disease will become a first world concern.

Part C: The meaning and the implications of climate change

This section considers the meaning of climate change, theologically, under four headings:

1. Developing a *spirituality* of creation
2. Seeing *stewardship* as self-control
3. Enhancing our understanding of *ethical* responsibility
4. Placing the *purpose* of life in eschatological context

1. Developing a spirituality of creation:

Our human relationship with dealings with creation can be understood according to various principles. Two important principles deal with

- **Rights** —that is, the God-given right for humanity to *use* creation, as when God says:

Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground...I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds of the air and all the creatures that move on the ground—everything that has the breath of life in it—I give every green plant for food.

Genesis 1:28-29

- **Responsibilities** —that is, the God-given responsibility to *care* for creation. It is now well understood that when God says, 'Fill the earth and subdue it' or 'Bring it under your control' (Gen. 1:28) this does not mean to use it up or destroy it. We are to live responsibly.

To some extent these two principles operate in tension. They exist in a continuum, with the right balance of use and care being whatever is considered '*sustainable*'. This means meeting the needs of the present without compromising the ability of future generations to meet their own needs. This has profound implications for our understanding of consumption.

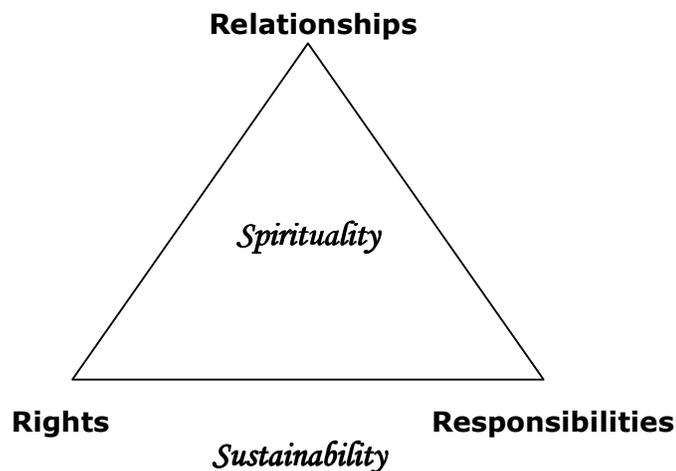
Our present consumption of the world's resources is intimately tied to climate change. Globally, it is our consumption that is leading to climate change. How do we understand 'consumption'?

- Economic understanding: consume, use what you can afford;
- Political understanding: consume/use what is just and fair;
- Environmental understanding: consume/use what is good for the environment;

- Sustainable understanding: use and consume what allows both present and future to enjoy all the benefits of the world that God has given to us.

But, we must note that questions about consumption and sustainability must be addressed in a broader context. It is important to operate sustainably, but our understanding of creation is not complete simply by a determination as to what is sustainable. That would be to take a very functional or utilitarian approach to the natural world. It operates solely on the 'rights' vs 'responsibilities' axis and I think that we should shift *off* that axis. Or at least off operating on that axis alone.

I suggest that there is *another dimension* to the 'rights - responsibility' axis. That is, there is a '*relational*' dimension. Here the primary question is not about what we '*do*' with creation, but about who *we are* in relation to the created order. And just as 'sustainability' represents the 'answer' for the right balance for the rights and responsibilities axis, so '*spirituality*' represents the answer or the right balance for all three dimensions of rights, responsibilities and relationships.



The most traditional creation theology identifies humanity as (a) created by God, and (b) given the role of stewardship. But there is probably more that needs to be said about (a) and probably about humanity in relation to creation before we get to (b). If we move too quickly to the task of dominion we treat the environment solely as object — something to be used, controlled, manipulated (for good purposes). Then world is thus seen purely as a resource.

We need to ask what *spiritual* significance the world has for us? What deeper meaning is there to the fact that we are made as part of this amazing world?

- We *learn* from it
- We *appreciate* it
- We *live with* it

- We live *in* it
- We see *God* in it
- We *relate* to it
- We find *meaning* in it
- We *are part* of it
- We *relate to others* within it

So,

- What do we learn about *ourselves* from the environment and our part in it?
- What do we learn about the *others* with whom we participate in this world?
- What do we learn about *God* from this world?
- What do we learn about *the world* from the way in which we live in the world.

Indeed, what is the spiritual significance of *the way we identify ourselves in a debate such as this*? When we say something like 'Australia (or Tasmania, if you like) only produces a minuscule part of the world's total greenhouse gases – what we do doesn't matter', then, leaving aside the practicalities of that, what is the *spiritual* significance of a statement such as that? What does it say about us? About our corporate identity? 'Us' versus 'them'?

What is the spiritual significance of *consumption*? Climate change is connected directly to questions of consumption and the use of resources, and this has to be seen in global perspective. What is the spiritual significance of the fact that we consume and travel and live in this way? This is to ask fundamental questions about what we do with our lives. But I think these are questions that need to be asked. Our ecological concern is not just a matter of pragmatics, it is an issue related to the gospel. What is the spiritual significance of all the various parts of the climate change issue?

2. Seeing stewardship as self-control:

The second dimension to be considered is our stewardship role. Climate change provides us with an opportunity to re-consider what this means. We usually remember that God entered into a covenant with his *people*, a covenant in which he would protect and care for them. But we often neglect the fact that God also entered into a protective covenant with *all* the creatures of the world. We read in Genesis 9:8-17 that God said to Noah and to his sons:

I now establish my covenant with you and with your descendants after you and with every living creature that was with you—the birds, the livestock and all the wild animals, all those that came out of the ark with you—every living creature on earth.

The sign of this covenant was, of course, the rainbow, and so God said to Noah:

This is the sign of the covenant I have established between me and all life on the earth.

It is true that God also gave a particular privilege and responsibility to humanity to tend and care for the world as humanity's participation in God's purposes but the covenant itself is with all life. Humanity is one species, one part of this world, part of the created order. Certainly unique, even the high point. With a distinct moral status. Though this does not diminish the intrinsic value of the rest of creation.

Humanity has been given a special role— not as *dominators* but as *stewards* of the world. How do we understand this responsibility as stewards in the light of climate change? Earlier I pointed out how the world is constantly changing. Change is a natural part of our world. Should we be trying to prevent climate change?

Our role is to protect the world, to care for it. What do we think we are protecting the world from? Natural forces? Natural changes? These are part of the natural world. What is our mental picture of human stewardship? Do we have a picture of humanity standing against external, destructive forces? Did God call humanity to protect the world from some other enemy or danger? Or perhaps we are not protecting the world from something or someone else but *from ourselves*? Perhaps our greatest responsibility as stewards and protectors of the world is to protect the environment from what we do.

With nuclear weapons and with anthropogenic climate change, humanity has now reached the point where humanity is able to destroy not merely part but the whole of the life of the world as we know it. And the interesting and different thing about climate change is that, unlike nuclear weapons, it is a power not held by a few nations but by all people. It requires us to consider stewardship as a corporate, global responsibility.

What does that mean for a small country like Australia and a small state like Tasmania? Although globally Australia is nowhere near being the leading overall emitter of greenhouse gases we are, arguably, the world's biggest per capita contributors to greenhouse gas pollution. Australians are directly involved in the causes of climate change which is damaging the world. The response to this has to be a whole-of-society response.

It would not be right for individuals to leave it to community groups, or for community groups to leave it to business, or for businesses to leave it to government. For one state to leave it to a bigger state, or for the states to leave it to the federal government. Or for Australia to leave it to larger nations. It must be a whole of society responsibility.

Throwing a lolly wrapper on the ground does not do much damage to the environment compared with the damage done by some businesses – but we teach our children not to throw their wrappers on the ground because we recognise both the importance of developing the right attitude (those who, as children, have no problem littering with lolly wrappers are likely to have no conscience about greater pollution later in life) and the moral

responsibility which exists even in small matters.

Australia's contribution to the overall amount of greenhouse gases may be small by international standards but our credibility in the world, our moral responsibility to our global neighbours and our influence on others will be diminished unless we act. And we must remember our special moral responsibility as a developed nation whose way of life has benefited most from the causes of global warming to continue to lead the way in finding solutions. Our stewardship requires this.

3. Enhancing our understanding of ethical responsibility

The idea of global stewardship leads into the next area of re-thinking our ethical responsibilities. The main point to be made here is that it is important to avoid short-sighted and narrowly focused views of life. I believe that climate change has the potential for helping us go beyond what I have called 'tribal understandings' of moral responsibility.

- We have a 'tribal' understanding of morality whenever we treat someone who is not in 'our group' morally differently.
- And we have a tribal understanding whenever we align ourselves with another group as an 'us' against 'them'.

For example, I have concerns whenever I hear, with respect to greenhouse gas emissions, that the problem is not us, it's China or America, or wherever. It is true that in China a new coal-fired power plant is coming into operation every five days and that they are developing new power equivalent to Australia's total production every month but should our attitude be 'it's not us, it's them'? Is that the way to think? We should at least ask ourselves whether Australians are more entitled to a particular standard of living than those in China; and to whom, if China is growing and producing so much, are they selling it all? (This is not to say we don't want to do something about cleaner technologies and so forth.)

We do, in fact, tend to have a tribal morality. We do treat people in other places morally differently. And we do this with regard to poverty and overseas aid. The wealthy world's treatment of starving people is appalling. I do not believe we would treat them as we do if they lived in Tasmania. About 3000 people died on 9/11, but every single day, 10 times that number of children die because of poverty. We treat them differently — to our shame.

One of the reasons that we do this is because we are able to treat them as different, they belong to another group, another place, another nation, with a separate economic system. Despite globalisation, it is still possible to have one economy in Africa and another in Australia. While there are economic links there are also significant barriers. Indeed, a lot of intergovernmental discussion and national legislation about trade and tariffs seems to be about protecting the larger and more secure economies from the effects of the weaker and poorer economies. Whether that is so or not, at present, it is possible to have a strong economy in Australia which is fundamentally isolated or protected from the weaker

economies in Africa or Asia.

And so we treat them differently. We see these people who are starving as separate from us. As part of another culture, national, economy. We are not quite so responsible to God for them as we are for others. Somehow.

But the interesting thing with climate change is that it is *not* like the economy – it is not possible to change the climate in one part of the world and not in another! The global climate does not pay any attention to either national or international climate change legislation! The global climate operates as a whole. With climate change we have a truly global issue, not merely an issue which affects a lot of countries in the same or similar ways.

So we cannot work on changing the climate for one part of the world and not another. It is no use trying to mitigate the effects of climate change in one part of the world while continuing to promote it in another. That makes no sense.

Whereas in the past we have often allowed geographic, national, ethnic, cultural, religious and political boundaries to determine our attitude or behaviour towards other people (in war, poverty and aid, health, trade etc) we can do so no longer. If we think it through then climate change and our response to it has profound implications for all sorts of ethnocentrism, xenophobias, nationalisms and cultural and moral boundaries. Many of which are false, unhelpful and morally questionable.

If climate change is allowed to continue, without a global response, it will not only bring about climatic changes that will be damaging, it will create more social, political and inter-cultural problems than we have at present. And Australia will not be isolated from the international disputes over basic items such as water and food but also over the allocation of blame for various types of damage and loss. If climate change becomes dangerously bad, we may well be seen (as a wealthy consuming, long-term high level greenhouse gas emitting nation) as more guilty than others.

On the other hand, our response to climate change can be the means by which we resolve some of our world's divisions and antagonisms are resolved. Would it not be great to be able to use global warming as one example of positive relationships? We have the opportunity for the creation of a stronger global community just as was the case in Europe in the post-war period when pollution which crossed national boundaries led first of all to international problems, and then to international cooperation and thus to a new view of the way that the environment should be treated.

So,

- it could be that our response to climate change could help us get beyond the politics of left and right;

- it could lead us to a new appreciation of the need for the Millennium Development Goals to be met;
- it will hopefully bring cooperation between industrialised/developed and developing/third world countries;
- it should also give us a deeper appreciation of the need to live now in such a way that the lives of future generations will not be compromised.

The task which Christ has given to the church means, in particular, a commitment to caring for people through care for the creation. When thinking of large-scale environmental issues God's call to love our neighbours means:

- taking a global, rather than purely national focus;
- recognising that there is unequal access to natural resources;
- that the effects of environmental disasters fall unevenly on the people of world;
- understanding the greater difficulty of poorer nations and the moral responsibility of wealthier ones.
- genuinely loving our global neighbours through just, loving and sacrificial action (Matt. 22: 34-40).

4. Placing the purpose of life in eschatological context

Finally, climate change connects past, present and future. We stand at the end of a long history of events. And we stand at the start of the future of the world. Even if there were no more greenhouse gases as of today, what has already happened will continue to have effects for hundreds of years. We need to understand ourselves within a line of human and planetary history.

Paleontologists locate us in the Holocene era –a warm period of the last 10–12 millennia. But are we at the beginning of what we might call the 'anthropocene era' – the human era? This would be an era beginning in the latter part of the 18th century when global concentrations of CO₂ and methane began to rise (coinciding with James Watts steam engine) because of human activity, and the global climate starts to change.

Our care for the environment has to take into account the legacy we leave to our children and grandchildren. Some actions to mitigate global warming that we could take now will have little or no effect in our lifetime. Does that mean we need not bother? No, not only must we undertake them, but climate change once again offers the opportunity to develop our often narrow or non-existent understanding of our connectedness with past and future. Climate change puts us in the broad context of the history of the world, helps us see the influence we have had on the planet, and helps us understand the nature of our civilization and our moral responsibility for those generations yet to come.

These issues are ones that everyone has to grapple with – not only

Christians. They are, in fact, questions about the meaning of life. They are questions about purpose and meaning into which a Christian hope can speak.

Beyond any consideration of climate change we recognise that God not only created the world, but will also redeem it through Jesus Christ – through whom all things originally came into being. One day the whole of creation will be freed from stress and disorder through Jesus Christ and his cross and will come to be a renewed creation (John 1: 1–3; Ephesians 1: 10; Romans 8: 21; Colossians 1: 19–20; 2 Corinthians 5: 17; Revelation 21).

However, this hope of a new creation does not detract from, but actually encourages Christians to care for our present creation as there is a direct connection between the two. This is the world that God will re-create. The Christian calling to serve God means sharing in the vision of the redemption of all things and having a concern for the whole of creation as well as for individuals. (2 Corinthians 3: 6; 1 Corinthians 15: 35–49).

Part D: The implications of anthropogenic climate change

1. Implications for our lifestyle

- We need to be responsible and take steps to reduce human induced greenhouse gases.
- Globally, this needs to be of the order of 30 to 60% reductions on 2000 levels by 2050 to stabilise at under 3^oC increase by 2100 to 2150.
- The precise implications will vary for each region.
- But steady-as-she-goes is inadequate. Significant changes are essential.
- See the IPCC Mitigation report <http://www.ipcc.ch/>

2. Implications of the spiritual dimension of life

- Consider the spiritual dimensions of lifestyle and consumption.
- Develop and renew a sense of harmony between ourselves, our Creator and the world.
- Relate these issues to our life of worship: thanksgiving, intercession, repentance.

3. Implications for our stewardship

- Address the question of human suffering and loss resulting from climate change.
- Consider our own role in the cause.

Climate change: problem or opportunity?

- Undertake a whole-of-society response: individual, family, church, business and government.
- Consider carefully the possibility of a corporate church response.

4. Ethical implications

- Use opportunity of climate change to re-assess moral relationships & obligations.
- Commit to working with other groups and nations, e.g. Kyoto & Montreal.
- Recognise special responsibility of wealthy nations, e.g. refugees.
- Care for developing nations & those most affected by climate change.

5. Considering the future and the purpose of life

- Consider responsibilities to the future & take long-term rather than short-term view.
- Encourage consideration of social & spiritual implications of climate change, as well as scientific.
- Relate broader dimensions of climate change to questions of meaning of life and the call of Jesus Christ.

Some useful web-sites:

ISCAST – Christians in Science and Technology <http://www.iscast.org/>

The Australian Evangelical Alliance <http://www.ea.org.au/>

Intergovernmental Panel on Climate Change <http://www.ipcc.ch/>

Department of Environment (Federal) <http://www.climatechange.gov.au/>

Department of Primary Industries and Water (Tasmania)
<http://www.dpiw.tas.gov.au>

The Climate Institute of Australia <http://www.climateinstitute.org.au/>