Global Cooling Beware the Snowman Cometh

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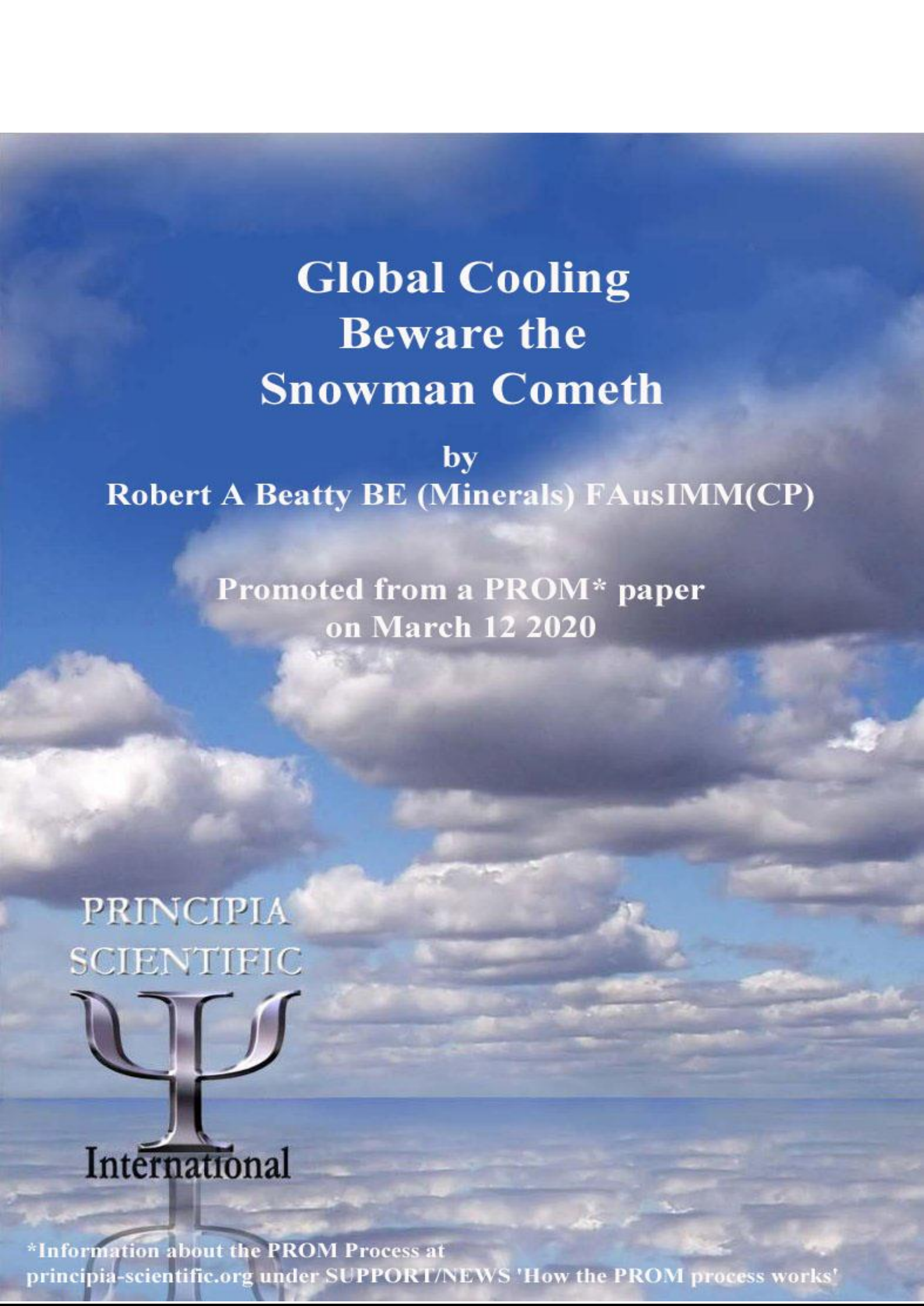

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Global Cooling
Beware the Snowman Cometh[1]

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Abstract.
The paper identifies a real possibility that Earth is approaching an extended period of unusually cold weather. This new Ice Age could include permanent surface ice over much of the northern and possibly the southern hemispheres, currently inhabited, which makes those regions unsuitable for major human habitation, in the future. A sequence of mass migration towards the equatorial regions is proposed to ensure a significant human survival rate is achieved. Major infrastructure requirements are identified as well as a new system of government to ensure peaceful cooperation occurs.

1) Introduction.
We have been "advised" by publicly funded eminent scientists, that the world is heating and will reach catastrophic levels very soon. The United Nations led this investigation with their series of "IPCC" reports. Apparently, all we have to do to avoid such a disaster is to limit our emissions of carbon dioxide gas.

Some of our politicians are seriously proposing a "zero carbon" requirement. This means no burning of hydrocarbon products for heating, transporting, generating electricity, etc, and we must presumably include exhaling to reach the zero target.

But, what if our eminent scientists are wrong? What if the world is cooling, not warming, and we are heading for another ice age, as a number of scientists are predicating?[2,3] Are our advisers offering any such simple solutions to such a predicament? The answer is clearly NO. One could reasonably conclude it is not part of recent serious discussion.

This paper considers what is possible if the world is facing a severe cooling period.

2) Global "Cooling" and "Warming" Periods.
NASA Earth Observatory report:[4]

> *Around 1970, some scientists suspected Earth was entering a period of global cooling. Decades prior, the brilliant Serbian mathematician Milutin Milankovitch had explained how our world warms and cools on roughly 100,000-year cycles due to its slowly changing position relative to the Sun. Milankovitch's theory suggested Earth should be just beginning to head into its next ice age cycle.*

However, 'cooling' did not immediately occur and was replaced by a concern for "global warming":[5]

Global warming is a long-term rise in the average temperature of the Earth's climate system, an aspect of climate change shown by temperature measurements and by multiple effects of the warming. The term commonly refers to the mainly human-caused observed warming since pre-industrial times and its projected continuation, though there were also much earlier periods of global warming. In the modern context the terms global warming and climate change are commonly used interchangeably, but climate change includes both global warming and its effects, such as changes to precipitation and impacts that differ by region. Many of the observed warming changes since the 1950s are unprecedented in the instrumental temperature record, and in historical and paleoclimate proxy records of climate change over thousands to millions of years.

In 2013, the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report concluded, "It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century." The largest human influence has been the emission of greenhouse gases such as carbon dioxide, methane, and nitrous oxide. In view of the dominant role of human activity in causing it, the phenomenon is sometimes called "anthropogenic global warming" or "anthropogenic climate change." Climate model projections summarized in the report indicated that during the 21st century, the global surface temperature is likely to rise a further 0.3 to 1.7 °C (0.5 to 3.1 °F) to 2.6 to 4.8 °C (4.7 to 8.6 °F) depending on the rate of greenhouse gas emissions. These findings have been recognized by the national science academies of the major industrialized nations and are not disputed by any scientific body of national or international standing.

3) Quantifying Global "Climate Change".

Dr David Whitehouse, GWPF Science Editor, 07/02/19 wrote "WORLD COOLING – BUT RAPID WARMING FORECAST"[6] which included the following exhibit:

> *Average global temperature has been falling for the last 3 years, despite rising atmospheric CO2 levels.*
> *21st century average global surface temperature change and CO2 rise; graph GWPF*
> *A big story at the beginning of each year is the release of the global surface temperature of the previous year. A big story certainly but not often a surprising one. Since the beginning of the century it didn't change much from year to year until the 2015/16 super El Nino came along. Then the temperature went up, as usual, and now it's coming down again.*

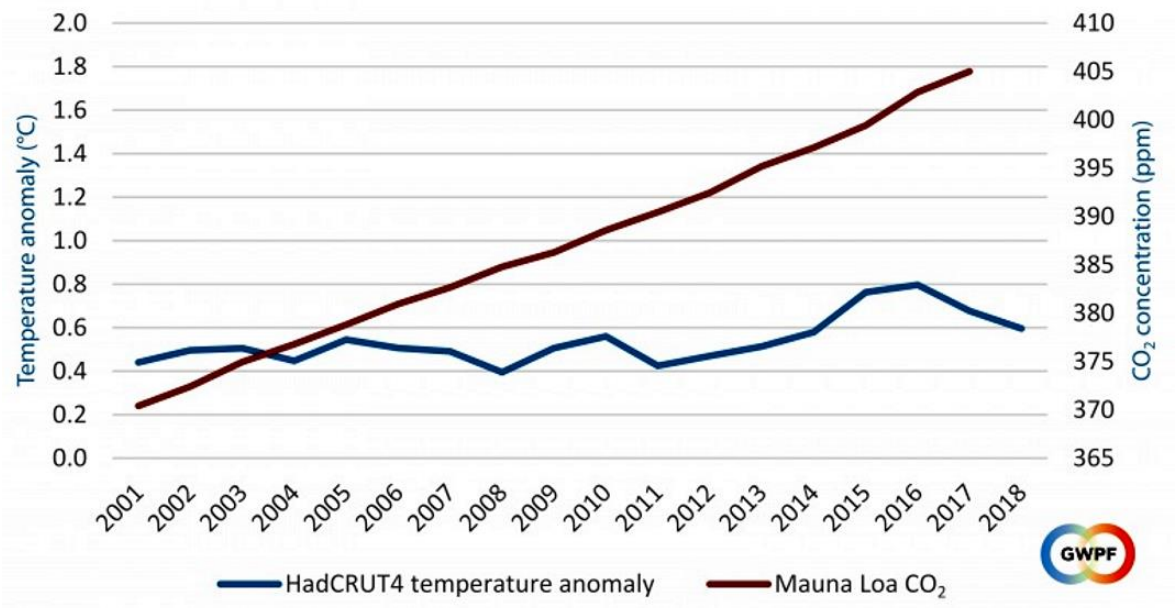


Figure 1.

4) Henry's Law (HL).[7]

> *Henry's law is one of the gas laws, formulated by the British chemist, William Henry, in 1803. It states that:*
> *At a constant temperature, the amount of a given gas dissolved in a given type and volume of liquid is directly proportional to the partial pressure of that gas in equilibrium with that liquid.*

HL is particularly important in the context of "climate change", because it effectively states that the concentration of carbon dioxide (CO_2) in the atmosphere is controlled by the temperature of the ocean. This relationship is quantified by Emeritus Professor Lance Endersbee's equation: $y = 143.6x + 334.1$ where y is in parts per million (ppm) and x is ^oC.[8]

The importance of HL in this context is it demonstrates that a soluble gas such as CO_2 can enter a solvent such as sea water, up to a limited amount which is determined by the sea temperature, or to be more specific the sea surface temperature (SST).[9] CO_2 being a heavy gas, facilitates this interchange by sinking to sea level, which is also facilitated by CO_2 being very soluble in rain water.[10] This is a continuing process which shows the Keeling Curve's saw tooth shape is controlled by seasonal temperature variations.[11]

However the reference also discusses "Is the Current Rise in CO_2 Definitely Caused by Human Activities?":

> *A correspondent recently asked Keeling Curve researchers to settle a family disagreement about the cause of rising CO2 levels in the atmosphere and whether the current trend is natural or human-caused. Scripps geochemist Ralph Keeling provided the following answer:*
> *The rise in CO2 is unambiguously caused by human activity, principally fossil-fuel burning. This is clear from the numbers: We know how much fossil fuel is converted into CO2 each year and emitted into the atmosphere. The CO2 doesn't all stay there because some enters the ocean and some is taken up by photosynthesis, which ends up in land plants and various types of biomatter.*

This answer is inconsistent with, and does not refer to HL which requires that the entire increase recorded in atmospheric CO_2 is due to increase in SST. The important conclusion to be drawn here is that atmospheric CO_2 concentration is a proxy for SST.

5) Figure 1. Interpretation.

Keeling recorded information is available for the period from 1958 forward, as shown in Figure 2a Keeling Curve.

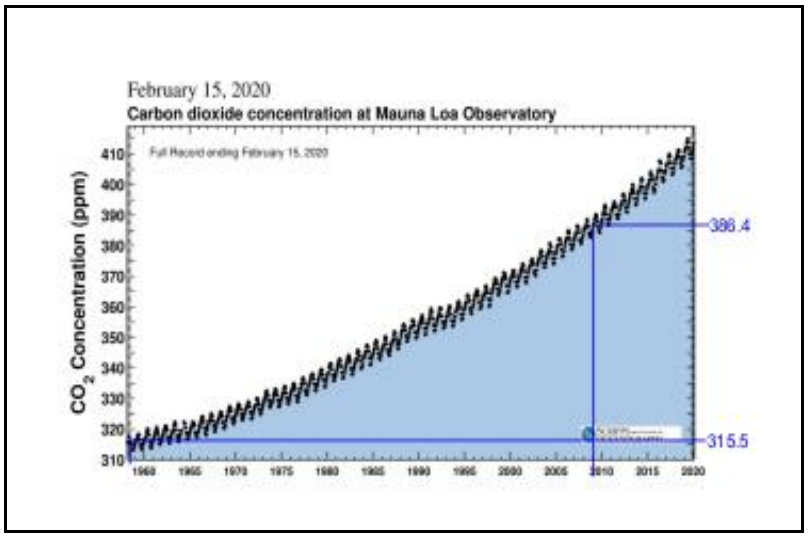
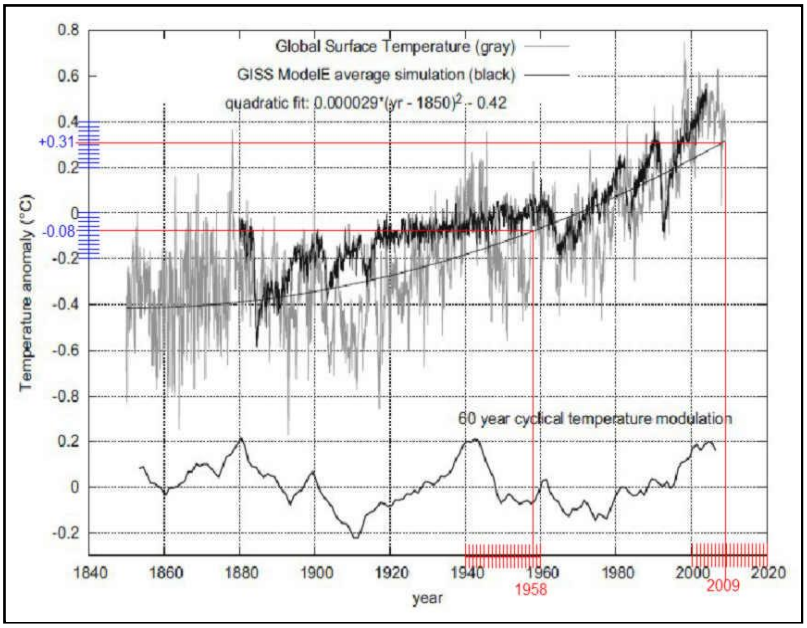


Figure 2a Keeling Curve

Figure 2a shows CO_2 concentration changed during that period from 315.5ppm to 386.4ppm, or 70.9ppm. This is equivalent to an SST increase of +0.494 ^oC calculated from Endersbee's equation.

Global temperature records are less categorical, but Nicola Scafetta who is a research scientist at the University of Napoli Federico II completed a comprehensive review of the available databases and summarised his results in Figure 2b Scafetta Temperature Analysis, which shows information from 1840 to 2009.[12]



"Fig. 1. Top: global surface temperature anomaly (gray) (Brohan etal., 2006) against the GISS Model E average simulation (black) (Hansen etal.,2007). The figure also shows the quadratic upward trend of the temperature. Bottom:an eight year moving average smooth of the temperature detrended of its upward quadratic trend. This smooth reveals aquasi-60 year modulation."

Figure 2b Scafetta Temperature Analysis.

Figure 2b shows the average global surface temperature changed from -0.08 ^{o}C in 1958 to +0.31 ^{o}C in 2009, a global temperature increase of +0.39 ^{o}C during the 1958 to 2009 period. The land and sea surface temperatures are combined in this one temperature record.

Common global temperature and CO_2 data is therefore available for the period 1958 to 2009, and is used to interpret the Endersbee' CO_2 vs SST equation.

Given that the sea occupies 70.8% of the Earth's surface and land is 29.2%,[13] we can calculate the land only temperature change: 0.708*0.494 + 0.292*X = 0.39
Therefore X= 0.138 ^{o}C where X is the Land Temperature component.

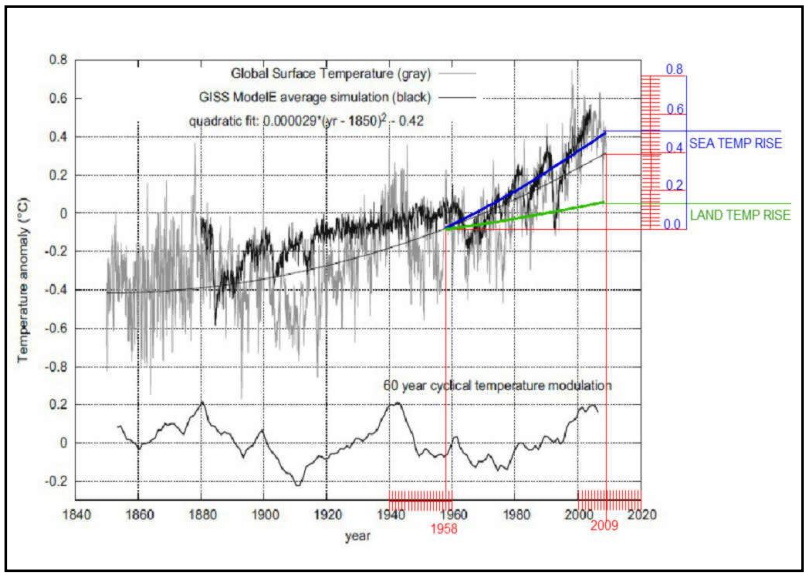


Figure 2c Land and Sea Temperatures.

Figure 2c shows the 1958 temperature scale RHS at 0.0 ºC
The sea has heated by 0.494 ºC, but the land has heated by only 0.138 ºC to account for the average global temperature increase of 0.39 ºC as shown.

This means the average ‘global land temperature' is considerably colder than the 'average global temperature' as illustrated in Figure 2c Land and Sea Temperatures. Figure 2c includes the estimated SST and Land Temperature variations (mostly in the northern hemisphere) required to produce the global temperature anomaly experienced between 1958 and 2009.

Rising sea temperature is expected to produce a climate effect as more moisture enters the atmosphere. This causes additional cloud cover to form, which leads to land cooling, and additional ‘high energy’ ice formation on Earth’s ice fields. Increased ice cover leads to higher albedo resulting in more sun light reflected back into space.

The net effect of these changes is in an accelerating global cooling phase.

This conclusion feels right when one considers the series of bitterly cold winters the northern hemisphere has experienced over recent years, combined with the evidence of low solar spot count.

6) Core Heating.

What is missing here is a discussion on how Earth's core activity affects sea temperatures. The sea is the only tangible connection there is with this prime environmental driver, and the atmospheric concentration of CO_2 is the only reliable temperature gauge (via Henry's Law) that we have of surface ocean temperature changes.

Heat from the core escapes to the sea - which plumes hot water to the surface, as seen on the Pacific east coast off South America.[14] Argo buoys are an array of free drifting floats that measure sea temperature.[15] However they are pushed outwards by rising plumes which biases their readings low, because locally hot regions of sea are eliminated from their records.

7) Solar Heating.

Sun spot activity is at a low ebb and there is considerable discussion on what effects that may have, or is having on Earth's climate.[16]

> *The sun may be dimming, temporarily. Don't panic; Earth is not going to freeze over. But will the resulting cooling put a dent in the global warming trend?*
> *A periodic solar event called a "grand minimum" could overtake the sun perhaps as soon as 2020 and lasting through 2070, resulting in diminished magnetism, infrequent sunspot production and less ultraviolet (UV) radiation reaching Earth — all bringing a cooler period to the planet that may span 50 years.*
> *The last grand-minimum event — a disruption of the sun's 11-year cycle of variable sunspot activity — happened in the mid-17th century. Known as the Maunder Minimum, it occurred between 1645 and 1715, during a longer span of time when parts of the world became so cold that the period was called the Little Ice Age, which lasted from about 1300 to 1850.*

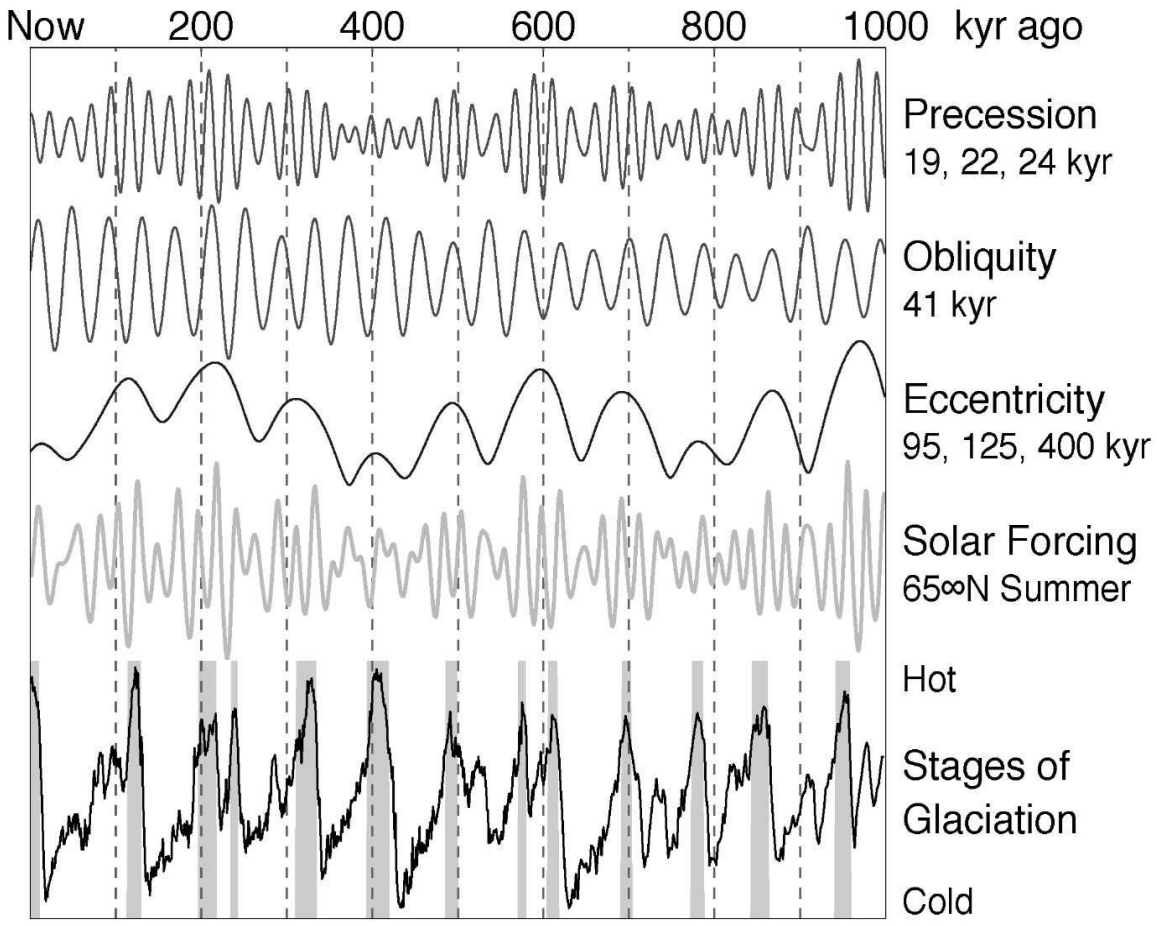


Figure 3 The Milankovitch Cycles.

Figure 3 are more specific:[17] and includes historic 'Stages of Glaciation' over the past one million years. This shows that "Now" is completing a warm period illustrated by the lowest LHS grey line, and is about to enter a new stage of cold, and is consistent with the low eccentricity and cold patterns of 350 and 750 thousand years ago.

This sequence is well described at YouTube video[18]

It is reasonable to conclude that sea temperatures are controlled by core activity, and land temperatures which are dropping in many regions, are mostly affected by solar activity. The interaction of these two drivers ensures that no two "ice age" events will be identical.
The impact of a new ice age could become critical as soon as 2025.

8) Ice Age Consequences.[19]

What would happen if there was an ice age today?

> *--- if another one came it would have pretty big consequences for human civilisation. Besides the fact it would be an awful lot colder, huge regions where hundreds of millions of people live would become completely uninhabitable. They'd be covered in thick ice sheets and subject to an inhospitable climate.*
> *"Assuming it was similar to the last one, then north America would be covered in ice, the whole of northern Europe, the whole of northern Asia would be covered in ice," Dr Phipps said.*
> *There would be a lot less agricultural land available, so it would be very difficult to support the human population, Dr Phipps warned.*
> *And the physical shape of the continents would look completely different across the whole planet.*
> *A huge drop in sea level of up to 120 metres would close down marine channels - the Mediterranean Sea, Torres Strait, Bass Strait and Bering Strait - and create new areas of land that could be used for habitation or agriculture.*
> *Ocean ports would no longer be on the ocean, and anyone wanting water views would need to relocate large distances.*

These consequences would be truly horrendous for life on Earth as we know it today. The very least we can do is to develop an emergency plan to mitigate some of the worst side effects of an Ice Age event.

Lands grossly affected by a new ice age are described as "Ice Age Realm" countries (IAR).

9) Mitigation Considerations

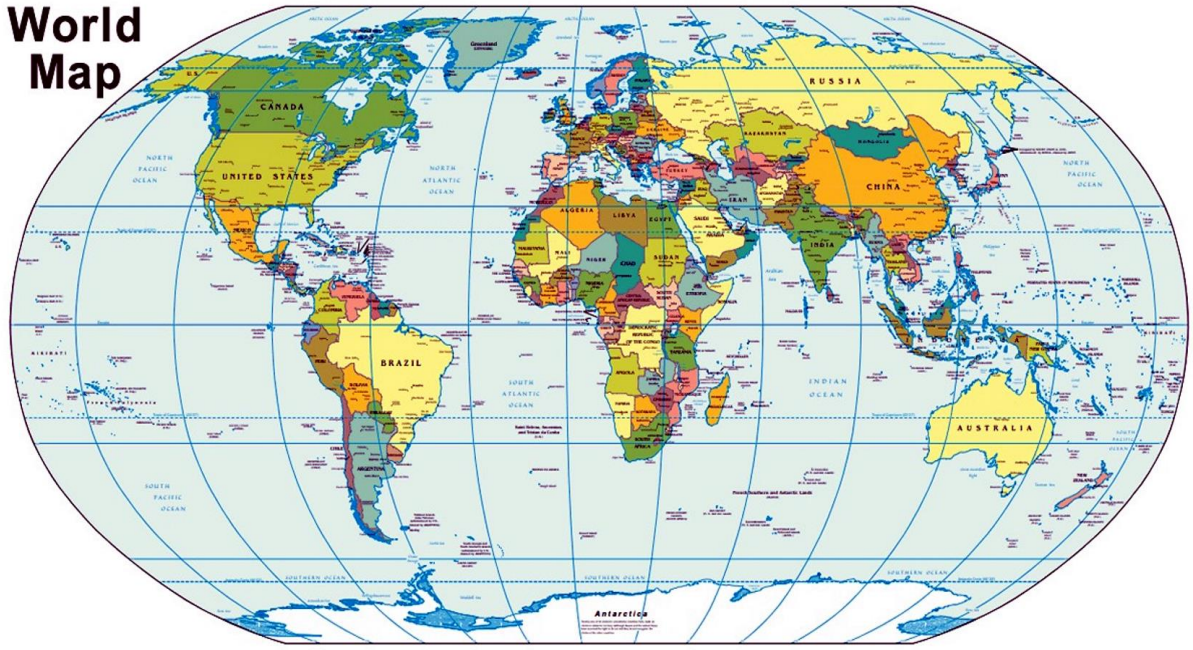


Figure 4 World Map.

The higher latitudes are more at risk, with the northern hemisphere probably the most effected, as shown in Figure 4.[20]

> *The Northern Hemisphere is home to approximately 6.57 billion people which is around 90% of the earth's total human population of 7.3 billion people.*[21]

If we concentrate on the band within the tropical latitudes, and assume this will be a survivable region during a severe ice age. The region includes the top of Australia through to northern India and southern China, a large slice of Africa and southern Arabia, Brazil to the Texas border in the Americas, and large island areas of the Indian, Atlantic, and Pacific oceans.

Lowering sea levels can be expected to reveal several submerged island regions, but not before the ice age is well established.

10) Development Options

The two possible options for sanctuary are; using existing land, and new land developed through reclamation. The latter option is the more demanding for construction, but easier to gain approval.

10.1 New Land Development.

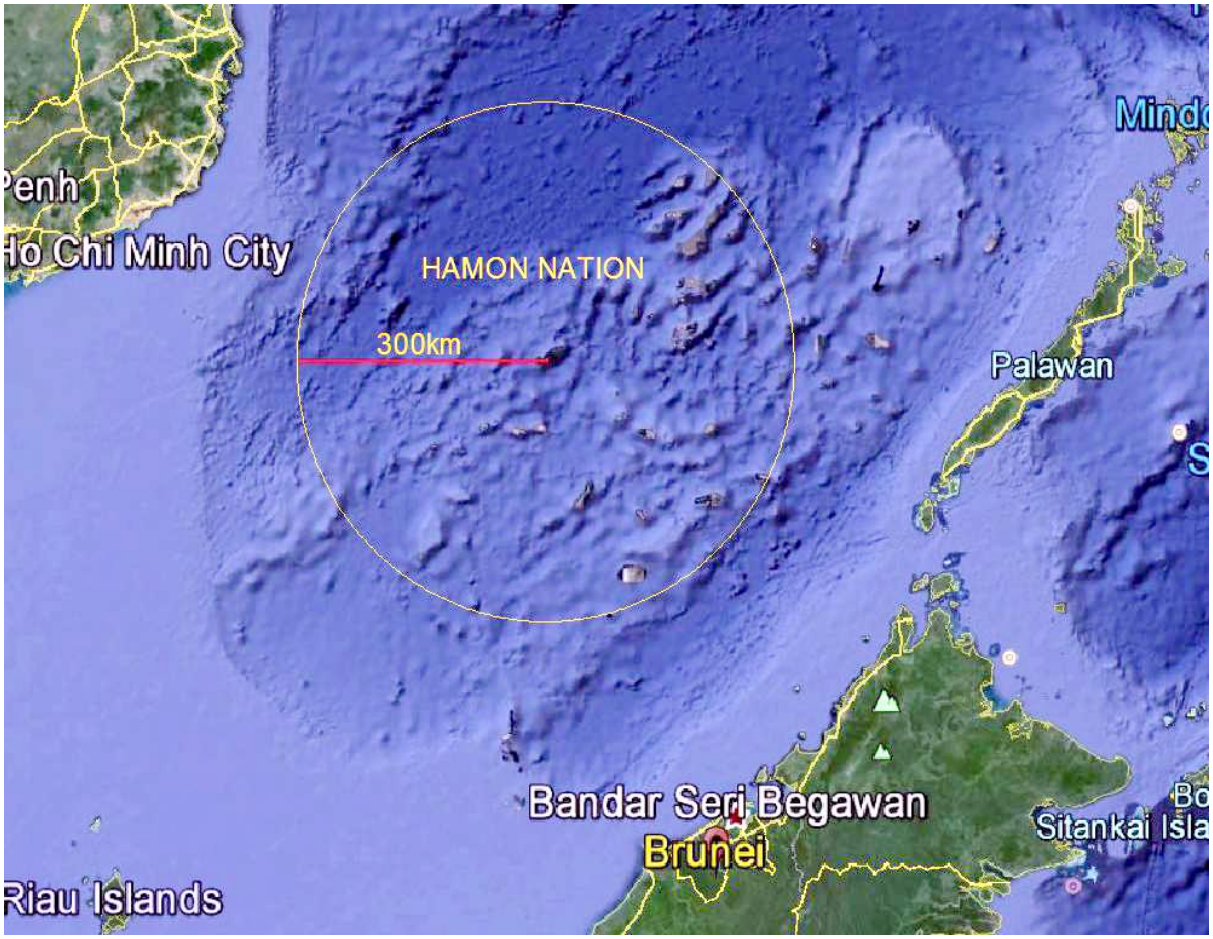


Figure 5 The Hamon Proposal.

Spratly Island reclamation project is the subject of current development and herein described as Hamon development proposal,[22] and illustrated in Figure 5.

The Hamon proposal includes: Industry, Management, Society, Land Formation, Economy, and Border Security, as well as other associated considerations.

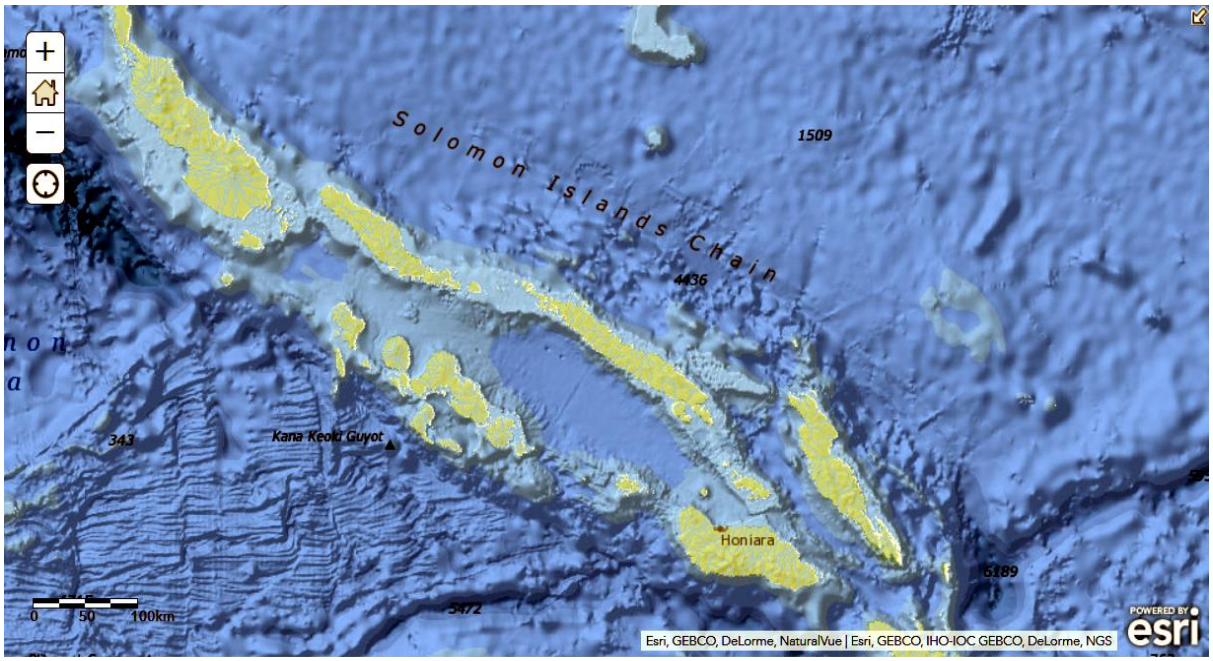


Figure 6 Solomon Islands.

Similar shallow land reserves can be isolated near existing island chains, and in tropical locations, such as the Solomon Islands shown in Figure 6.[23]

These areas may be suited for reclamation or for dyke protection followed by dewatering.

10.2 Existing Land Development.

Access to existing land requires compiling an internationally agreed IAR (Ice Age Realms) list. The list will include countries that will be seriously impacted by a new ice age. The aim is to concentrate on developing existing secure land masses, suitable for the influx of large numbers of ice age environmental refugees.

Negotiating access and compensation to existing land owners are initial priorities. Provision of water and energy supplies are subsequent, but urgent priorities followed by preparing suitable agricultural land. Costs associated with this work to be borne by the IAR countries.

New forms of government are required to introduce smoothly such a system of relocation for ice age refugees. The Hamon system of government, previously referenced, may be suitable and could be developed to apply to onshore developments as well as offshore reclamation projects.

Significant project stages could include:-

- $ Allocate national regions through ballot.
- $ Identify land use options.
- $ Identify energy sources.
- $ Formulate environmental refugee habitat regulations.
- $ Negotiate land access and compensation.
- $ Complete land surveys.
- $ Conduct marine reclamation options.
- $ Define water assets.
- $ Compile aquaculture and agriculture precincts.
- $ Develop infrastructure plans.
- $ Construct infrastructure.

11) Conclusions.

1. Henry's Law shows that atmospheric CO_2 concentration is a proxy for SST.
2. The sea has heated noticeably, but the land has not. This accounts for the 'average global temperature' as reported.
3. We conclude that sea temperatures are controlled by core activity and land temperatures, which are dropping in many northern regions, are mostly affected by solar activity.
4. The interaction of these two drivers ensures that no two “ice age” events will be identical.
5. New forms of government (such as the Hamon proposal) are required to smoothly introduce a system of rapid mass relocation.
6. Existing tropical land and island reclaimed land are possible for new residential locations.
7. The impact of a new ice age could become critical by 2025.

12) References:

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