The Third Horseman

When the Lamb opened the third seal, I heard the third living creature say, "Come and see!" I looked, and there before me was a black horse! Its rider was holding a pair of scales in his hand. Then I heard what sounded like a voice among the four living creatures, saying, "A quart of wheat for a day's wages, and three quarts of barley for a day's wages, and do not damage the oil and the wine!"

Revelation 6: 5-6

Famine:
MENA Population Growth
At 2% per annum growth, MENA population will be up by 250 million by 2030.
Extending that to 2030

Middle East - North Africa Population Growth 1961 - 2030

If all their calorific requirements were met by wheat, this would be 70 million tonnes per annum.
- more than the US wheat crop.
3% growth is doubling every 25 years.

Middle East - North Africa
Population Growth Rates
1961 - 2009

Jordan
Saudi Arabia
Afghanistan
Yemen
China avoided calamity, India is headed for disaster.
Africa is also headed for trouble.
Some African Population Growth Rates

-1.0% 0.0% 1.0% 2.0% 3.0% 4.0% 5.0%


Zimbabwe
South Africa

South Africa
Zimbabwe
Tunisia: The Arab Spring began with a vegetable vendor, but what they mainly eat is wheat.
Yemen is on its way to being a failed state.

Yemen Grain Consumption
1968 - 2010

A 2,500 calorie per day diet equates to 267 kg of wheat per annum.
As ability to pay for imported food is declining rapidly.
And these islands come up for grabs.
Afghanistan – another basket case

Afghanistan Wheat Consumption
1960 - 2010

By 2037, Afghanistan will require a further 6.6 mtpa of imported wheat, taking imports to 10.0 mtpa - they can't be fed in the future, so there is no point in feeding them now.

US Involvement Begins
Imports

Russians
Drought

Population growth doesn't fall below 2.0%
Afghanistan – something like this will happen.

Population of Afghanistan 1960 - 2025:
Food imports will stop at some future point

Wheat imports cease due to physical lack of grain or lack of finance

Natural carrying capacity of Afghanistan based on 3 mtpa of wheat production

US Involvement begins

Russians

Planting disrupted and some seed grain eaten

Population reduced to two thirds of natural carrying capacity
Pakistan Wheat Production
- up five fold in 50 years
If population growth keeps going
Wheat Yields plateaued from 1996.

Wheat yields in developing countries 1950 - 2005

200% increase over 35 years
By 2030, Egypt will be importing twice as much grain as it grows.
Fuel is also subsidised in Egypt - the Muslim Brotherhood will have a hard time balancing the budget.
Goodbye Egypt – mass starvation begins in 2012.

- 11.30 am, 16th December 2010: Tunisian vegetable vendor immolates
- 11th February, 2011: President Mubarek resigns
- 16th October, 2011: Outside directors fired from Central bank Board so the generals could speed up the stealing
- Projection at $2 billion/month
- September 2012
By 2030, Egypt will be needing the equivalent of 100% of US wheat exports.
The mandated ethanol requirement has brought the future forward in terms of food scarcity.
US Production could feed 1.2 billion vegetarians.
Brazil might outrun its population growth, but how much of the Amazon is left to clear?

Protein content of:
Soybeans 38%
Wheat 12%

In protein content, Brazil's soybean exports equate to 100 mtpa of wheat.
Mexico’s population growth rate is down to 1.0% per annum.
Though ability to pay is falling more rapidly.
Russia struggles with weather events and a command economy.
Australia doesn’t have much of a buffer.
Why grain prices went down for 70 years.

<table>
<thead>
<tr>
<th></th>
<th>1930</th>
<th>1975</th>
<th>2010</th>
<th>2010 vs 1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>2 billion</td>
<td>4 billion</td>
<td>7 billion</td>
<td>250%</td>
</tr>
<tr>
<td>Wheat</td>
<td>127</td>
<td>355</td>
<td>682</td>
<td>437%</td>
</tr>
<tr>
<td>Corn</td>
<td>113</td>
<td>324</td>
<td>817</td>
<td>623%</td>
</tr>
<tr>
<td>Rice</td>
<td>89</td>
<td>360</td>
<td>679</td>
<td>663%</td>
</tr>
<tr>
<td>Barley</td>
<td>41</td>
<td>150</td>
<td>147</td>
<td>259%</td>
</tr>
<tr>
<td>Rye</td>
<td>47</td>
<td>24</td>
<td>17</td>
<td>-64%</td>
</tr>
<tr>
<td>Oats</td>
<td>64</td>
<td>48</td>
<td>24</td>
<td>-63%</td>
</tr>
<tr>
<td>Total</td>
<td>481</td>
<td>1261</td>
<td>2366</td>
<td>392%</td>
</tr>
</tbody>
</table>

Those trends will now cross over.
The total is about 2,200 million tonnes.
Brazil will need a lot of fertiliser to remain productive.
Major Potential Sources of Increased Grain Production

US – mandated ethanol increased corn production by 100 mtpa, total potential may be 200 mtpa.

Russia – 40 m ha currently growing nothing, possibly an extra 90 mtpa of wheat

Brazil – 190 m ha could be put under grain at a yield of 2 tonnes per ha for 380 mtpa of grain.

The total is 670 mtpa which might feed 1,675 million people at 400 kg per capita.
Russia currently imports 46% of its food – will require a big price signal to increase production.

Undeveloped Brazilian land is a long way inland – will require higher prices to support the road and rail buildout.
The Fourth Horseman

When the Lamb opened the fourth seal, I heard the voice of the fourth living creature say, "Come and see!" I looked and there before me was a pale horse! Its rider was named Death, and Hell was following close behind him. They were given power over a fourth of the earth to kill by sword, famine and plague, and by the wild beasts of the earth.

Revelation 5:7-8

Death:
Climate – the 210 year cooling cycle
Climate: First of all, the world isn’t warming.

No change over 33 years
The temperature of the planet is the same as it was 30 years ago.

The satellite temperature record from www.drroyspencer.com
Ocean acidification – the last refuge of the global warming scoundrel

Coral reef and bubbling carbon dioxide, Dobu Island, PNG
Sea level rise – the second last refuge

As measured by the Envisat satellite
What the warmers did to Darwin – added 2.5° over 60 years

Faking Prague’s Temperature Record

Data Source: Global Historical Climate Network (part of NOAA)
Where atmospheric carbon will come from

Fossil Fuel Production
1800 - 2300

Million barrels of oil equivalent per annum
What that means for rate of increase of atmospheric CO2

Historic rate of increase of atmospheric carbon dioxide scaled against fossil fuel production.

Increase in carbon dioxide

Fossil Fuel Production

Mt Pinatubo cooling of 1992
We are getting a brief burst of aerial fertiliser.
Carbon dioxide is tuckered out as a greenhouse gas.
The World won’t stop having climate cycles just because they are inconvenient.

260 years of solar cycle data
Figure 5. The mean temperature at Armagh for 11 year intervals, centred on years of sunspot maximum and minimum, plotted against the sunspot cycle length. Symbols: open squares - Series I, filled squares - Series II. The mean regression line is shown.
Hanover, New Hampshire

Solar Cycle 22

Solar Cycle 23

Correlation = 0.73 degrees/annum

rsq = 0.53

2.0°C

Hanover, NH
Friis-Christensen and Lassen theory, using Butler and Johnson methodology, applied to Norway

- a 1.5°C cooling underway

Work by Professor Jan-Erik Solheim of Oslo University
Three wise Norwegians:

Jan-Erik Solheim*
Department of Physics and Technology, University of Tromsø, N-9037, Tromsø, Norway

Kjell Stordahl
Telenor Norway, Fornebu, Norway

Ole Humlum
Department of Geosciences, University of Oslo, Norway

Credit me with a scientific discovery:

Archibald (2008) was the first to realize that the length of the previous sunspot cycle (PSCL) has a predictive power for the temperature in the next sunspot cycle, if the raw (unsmoothed) value for the SCL is used. Based on

That enables climate to be predicted with great accuracy.

Dombaas, Norway

Dombaas: Temperature in average length sunspot cycles

Year

1860 1880 1900 1920 1940 1960 1980 2000 2020

Temp. (°C)

0.0 0.5 1.0 1.5 2.0 2.5

Predicted Decline

trend: \(-0.46^\circ\text{C}/\text{yr}\)

trend: \(0.46^\circ\text{C}/100 \text{ yr}\)

Length of sunspot cycle

9.5 10 10.5 11 11.5 12 12.5

Temperature (°C)

-2 -1 0 1 2 3 4

Length of the previous cycle

9.5 10 10.5 11 11.5 12 12.5

Yearly mean temperatures 1868-2010

Temperature (°C)

-1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0

1860 1880 1900 1920 1940 1960 1980 2000 2020

trend: \(0.95^\circ\text{C}/100 \text{ yr}\)
Northern Hemisphere

All the warming of the last 150 years will be reversed.

Predicted decline
Combine that with a prediction of solar activity:

We can now predict climate to 2040.
Using these three tools:

Solar cycle length - temperature

Hanover, New Hampshire

Solar activity forecast

Logarithmic heating effect of CO2
We are able to predict climate to 2040.

Hanover, New Hampshire
Climate Forecast to 2040

Including CO2 Heating Effect

Less CO2 Heating Effect


24

25
Famines in France 1693-94, Norway 1695-96 and Sweden 1696-97 claimed roughly 10% of the population of each country.

In Estonia and Finland in 1696-97, losses have been estimated at a fifth and a third of the national populations, respectively.
We see it in the thermometer record.

Central England Temperature
1659 - 2011

Dalton Minimum

The temperature spike down that killed a third of Finland
A prediction of Canadian agricultural response dating from the last cooling event 40 years ago.

A 1°C decrease would reduce the frost-free period by 15 days.  
A 2°C decrease would not allow the wheat crop to ripen before the first frost.  
A 5°C decrease – it’s all over.
The Corn Belt shifts south but total growing area remains the same.

The shift in growing conditions will be 144 km per degree C.
Arkansas

Corn Belt shifts to the Sun Belt

Corn for Grain 2010
Production by County for Selected States

U.S. Department of Agriculture, National Agricultural Statistics Service
It has happened before in the US.

Distribution of prehistoric ridge-furrow maize gardens in relation to present-day frost-free seasons.

The northern limit of prehistoric maize fields appears to have retreated up to 320 km southward concurrently with cooling in the thirteenth and fourteenth centuries.
24 years of drought in train for East Africa
Rate of sea level rise is controlled by solar cycles.
Statistically significant: $R^2 = 0.5381$

Sea level rise/fall is 0.045 mm per unit of sunspot number.
Which makes it a predictive tool.
Colder is drier.

The Itaipu Dam on the Parana River provides 90% of Paraguay’s electric power and 20% of Brazil’s.
If a Mt Pinatubo-type eruption is overprinted on a de Vries cycle event:

Then we get an 1816 – type crop failure event.
1816 Event – 50% Chance

- Mt Tambora in Indonesia erupted on 10th April, 1815.
- Average global temperatures decreased by 0.4 – 0.7° C.
- On 4th June 1816, frosts were reported in Connecticut.
- On 6th June 1816, snow fell in Albany and Maine.
- Oats rose from 12 cents a bushel to 92 cents a bushel.
- For the last 500 years, major volcanic eruptions averaged 45 years apart.
- One of these could easily reduce world grain production by 400 million tonnes.
Summary on Climate

1. The World has entered a sharp cooling period due to lower solar activity.
2. Mid-latitude grain production under threat with potential famines.
3. Carbon dioxide’s heating effect is real but minuscule.
4. Sea level now falling.