ACID SEAS BACK TO BASIC

by Dennis Ambler





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ACID SEAS – BACK TO BASIC

by Dennis Ambler | January 26, 2010

SUMMARY FOR POLICY MAKERS

- 1. Emotional claims are being made that the oceans are turning to acid. Acidic and basic are two extremes that describe a chemical property. The pH scale measures how acidic or basic a substance is and ranges from 0 to 14. A pH of 7 (e.g. water) is neutral. A pH less than 7 is acidic. A pH greater than 7 is basic.
- 2. The pH scale is logarithmic and as a result, each whole pH value below 7 is ten times more acidic than the next higher value. For example, pH 4 is ten times more acidic than pH 5 and 100 times (10 times 10) more acidic than pH 6.
- 3. The same holds true for pH values above 7, each of which is ten times more alkaline (another way to say basic) than the next lower whole value. For example, pH 10 is ten times more alkaline than pH 9 and 100 times (10 times 10) more alkaline than pH 8.
- 4. IPCC WGI state that the mean pH of surface waters ranges between 7.9 and 8.3 in the open ocean, so **the ocean remains alkaline.** It is dishonest to present to a lay audience that any perceived reduction in alkalinity means the oceans are turning to acid.
- 5. The claim that "ocean acidity" has increased by 30% since before the industrial revolution was calculated from the estimated uptake of anthropogenic carbon between 1750 and 1994, which shows a decrease in alkalinity of 0.1 pH unit, well within the range quoted by IPCC.
- 6. One of the authors of a prominent paper used by IPCC, sits on specialist panels on other bodies, such as the Royal Society, that come to the same conclusions. This is then presented in a manner to imply a consensus view from an apparently independent separate body.
- 7. A separate critique of that paper suggests it relates to an extrapolation of 18 years of data to 2100 and even 2300.
- 8. At least one University is equating seawater with vinegar in an on-line presentation for schools. Vinegar, (acetic acid), has a pH of 2.5, almost a million times more acidic in terms of hydrogen ion activity than seawater. This is deliberate disinformation to young people.
- 9. There are many contrary peer reviewed papers challenging the claims about the impact of CO2 on the oceans. One survey highlights some one hundred and fifty such papers, most of them showing that we cannot possibly acidify the oceans. The IPCC claims to present the physical science basis for IPCC claims but confines itself to a very narrow range of research and ignores the contrary papers.
- 10. Authors of papers supporting the IPCC position are already involved in IPCC AR5 and in one case their host University also provides the Technical Support Unit for WGII.
- 11. NGO involvement in further scientific research into Ocean "acidification", as they choose to call it, is clearly described on the web site of the UK Natural Environment Research Council, NERC, a grant awarding body.
- 12. NGO organisations cannot be held to have an independent scientific stance, they implicitly have an agenda. The use of non-peer-reviewed papers from NGO's in IPCC AR4, is currently the subject of major criticism relating to false claims of glacier melting, Amazon forest degradation and Extreme Weather cost impacts. It appears that they will be welcome again in AR5.

INTRODUCTION

In August last year, the National Resources Defense Council released a film "documentary" claiming that CO₂ is turning the oceans to acid: It was funded by the Entertainment industry foundation¹, and has the title, "Acid Test: The Global Challenge of Ocean Acidification". The supporting material states:

The process of ocean acidification is simple. The excess carbon dioxide from the burning of fossil fuels is not only stored in the atmosphere, it is also stored in the oceans (in fact, approximately ¼ of it -so far 500 billions tons - goes into the sea). As carbon dioxide reacts with ocean water, it forms a weak acid, carbonic acid.

This increasing acidity challenges ocean life on a few fronts. First, it reduces the availability of carbonate - a building block of sea shells. This results in slower growth rates and weaker shells in shelled organisms. If acidity goes high enough, shells literally dissolve, making the ocean uninhabitable to some creatures.

NRDC² was co-founded in 1970 by former dean of the Yale School of Forestry and Environmental Studies and former head of the UN Development Program, James Speth. In 1993 he also

founded the World Resources Institute, (WRI), on whose board Al Gore sits. They claim to be "the nation's most effective environmental action group, combining the grassroots power of 1.3 million members and online activists with the courtroom clout and expertise of more than 350 lawyers, scientists and other professionals."

THE ACTORS

The narration is by actress Sigourney Weaver, of "Alien" fame, giving a suitable aura of impending doom to the blurring of fact and fiction in this movie. The other actors are scientists, a fisherman and a couple of NRDC staff.

Early in the video Weaver states that:

Carbon dioxide pollution is transforming the chemistry of the ocean, rapidly making The narration is by actress Sigourney Weaver, of "Alien" fame, giving a suitable aura of impending doom to the blurring of fact and fiction in this movie. The other actors are scientists, a fisherman and a couple of NRDC staff.

the water more acidic. In decades, rising ocean acidity may challenge life on a scale that has not occurred for tens of millions of years. So we confront an urgent choice, to move beyond fossil fuels, or to risk turning the ocean into a sea of weeds.

The claims were not new but the release was part of the unspoken but widely apparent pre-Copenhagen "we're all doomed" program, and the mainstream media were right up there with them, fed by advocacy scientists, as in this example from The Hindu in December 2009: **Ocean acidification rates accelerating**³:

The world's oceans are becoming acidic at a faster rate than at any time in the last 55m years, threatening disaster for marine life and food supplies across the globe, delegates at the U.N. climate conference in Copenhagen have been warned. A report by more than 100 of Europe's leading marine scientists, released at the climate talks on Thursday, says the seas are absorbing dangerous levels of carbon dioxide as a direct result of human activity.

<u>Ocean acidification</u> — **the facts say** that acidity in the seas has increased 30 per cent since the start of the industrial revolution. Many of the effects of this acidification are **already irreversible** and are **expected to accelerate**, according to the scientists.

This was a re-run of claims emanating from the IPCC in 2007 with this typical media presentation: **A world dying, but can we unite to save it?**⁴

This was a re-run of claims emanating from the IPCC in 2007 with this typical media presentation: A world dying, but can we unite to save it? Pollution in the seas is now speeding global warming, says a devastating new climate report. 'IoS' Environment Editor Geoffrey Lean reports from Valencia, Sunday, 18 November 2007

Humanity is rapidly **turning the seas acid** through the same pollution that causes global warming, the world's governments and top scientists agreed yesterday. The process – thought to be the most profound change in the chemistry of the oceans for

20 million years – is **expected** both to disrupt the entire web of life of the oceans and to make climate change worse.

This is the same Geoffrey Lean, now working for the Telegraph, who has just discovered that the Himalayan glaciers⁵ are no longer going to melt by 2035, as firmly predicted by the IPCC AR4 report, even though he had assiduously reported their demise, in an article in 2006, for Indymedia:

Himalayan Glaciers Melting! Geoffrey Lean, Environment Editor Published: 07 May 2006: Global warming is rapidly melting the ice-bound roof of the world, and turning it into desert, **leading scientists have revealed**.⁶

The willingness of the media to uncritically headline every feed from the warmist scientists is vital to the massive public education campaign on global warming. It is only since Climategate that some environmental journalists are starting to wake up and realise they are

not being told the truth. Lean even went so far as to say the latest story on Himalayan glaciers was good news for the planet, which is not what the green movement wants to hear.

THE NRDC CLAIMS – A CLOSER LOOK

Lisa Suatoni of NRDC is described as a Senior Scientist within the organisation. She has a PhD in Ecology and Evolutionary Biology from Yale University and a Masters from the Yale School of Forestry and Environmental Studies, where Dr. Rajendra Pachauri, chairman of IPCC, is currently Head of the Climate and Energy Institute (YCEI).

Suatoni has a blog page entitled, Why Scientists Agree Ocean Acidification is Undeniably Caused by Humans:⁷

She says, "The short answer is because theory (i.e., the laws of physics and chemical thermodynamics) predicts it, and observations confirm it.

There are three well established processes in the phenomenon of ocean acidification:

- Atmospheric CO₂ concentrations are rising, primarily from the combustion of fossil fuels
- The ocean absorbs a large amount of this CO2
- When CO₂ gas dissolves into water, it becomes an acid.

In other words, we see a declining trend in ocean pH, and we can attribute that trend quantitatively to the rise in atmospheric CO₂ due to fossil fuels. The concurrence between theory and observation - as well as the absence of good alternative explanations - gives scientists high confidence that carbon dioxide pollution is causing ocean acidification.

How much of atmospheric CO₂ is due to combustion of fossil fuels is debated, but the other two points are correct; the conclusions are fanciful.

THE VINEGAR TRICK

Suatoni proceeds to reinforce the concept of acidity with the use of household vinegar. After all, people know that vinegar is acidic and acids dissolve chalky substances and some acids can burn. The aim of this is to ground the idea in people's minds that the oceans are just the same as this familiar household commodity, vinegar. Coral reefs are dissolving, or even "melting like candle wax", the phrase used in the film by Victoria Fabry, (Ph.D., California State University San Marcos), the ocean is becoming "toxic" as a result of Western lifestyles.

"It's really not much different from predicting that a cup of vinegar added to a gallon of distilled water will drive the acidity of that water up by a given amount - adding the vinegar - and then observing that the acidity did, indeed, go up by the expected amount. The logical, and most parsimonious, explanation is that the added vinegar caused the rise in acidity. To conclude otherwise would require an explanation for 1) what unknown process(es) neutralized the added acidity of the vinegar and 2) what alternative, unseen constituent(s), alternatively, caused the observed rise in acidity."

In terms of popular knowledge of familiar things she fails to mention that the pH of seawater is similar to that of sodium bicarbonate and carbonic acid produced in seawater from CO₂ in the atmosphere, is the same carbonic acid present in natural rainfall, at a pH of around 5.6. Her argument is fallacious because we do not add acid to the ocean, carbonic acid forms, and is used, as part of the complex acid-base interactions within the ocean, involving living organisms. The level of pH is not the prime determinant of calcification or otherwise.

THE SCIENTISTS

It seems she copied the vinegar idea from one of the scientists in the film, **Dr. Stephen Palumbi**.⁸ Professor Palumbi is based at Stanford University's Hopkin Marine Station and is a

Pew Fellow in Marine Conservation. He has a section on his web site that he calls **"Micro Docs – Short attention span science".** Science for the masses again.

In particular he has one on ocean acidification.⁹ He states that increasing carbon dioxide levels are making the oceans more acidic and the page has a short film, showing that coral placed in a flask of vinegar will dissolve and give off lots of nice bubbles. This is again planting the false perception that the oceans are acid, yet more science for the masses.

This is again planting the false perception that the oceans are acid, yet more science for the masses.

The sinister side of this is that the information presented is also intended for schools and he has a section for teachers:

Education Standards: Microdocs discuss several of the concepts laid out in the Life sciences (content standard C) and Sciences in Personal and Social Perspectives (content standard F) sections of the National Science Education Standards. The following pages in this section list the relevant concepts and then provide links to the appropriate microdoc(s).

Grades 9-12 have a link to the "vinegar video", so schoolchildren are being fed distorted science from a major National scientific institution by a highly qualified scientist. This really is unacceptable.

There is another interactive Stanford site with an opening photograph of ocean waves, but the colour has been changed to a pinkish sepia colour. It carries the title Acid Ocean¹⁰, making it a statement of fact. This is also designed for interactive school use

SIMPLISTIC SCIENCE

All stories have to have a foundation and we look no further than the IPCC for the starting point on acid oceans.

Climate Change 2007: Working Group I: The Physical Science Basis, 5.4.2.3 Ocean Acidification by Carbon Dioxide.¹¹ The statement is made:

The uptake of anthropogenic carbon by the ocean changes the chemical equilibrium of the ocean. Dissolved CO2 forms a weak acid. As CO2 increases, pH decreases, that is, **the ocean becomes more acidic**. Ocean pH can be computed from measurements of dissolved inorganic carbon (DIC) and alkalinity. A decrease in surface pH of 0.1 over the global ocean was calculated from the estimated uptake of anthropogenic carbon between 1750 and 1994 (Sabine et al., 2004b; Raven et al., 2005), with the lowest decrease (0.06) in the tropics and subtropics, and the highest decrease (0.12) at high latitudes, consistent with the lower buffer capacity of the high latitudes compared to the low latitudes. The mean pH of surface waters ranges between 7.9 and 8.3 in the open ocean, so **the ocean remains alkaline (pH > 7)** even after these decreases.

The consequences of changes in pH on marine organisms are poorly known (see Section 7.3.4 and Box 7.3). For comparison, pH was higher by 0.1 unit during glaciations, and there is no evidence of pH values more than 0.6 units below the pre-industrial pH during the past 300 million years (**Caldeira** and Wickett, 2003)¹². A decrease in ocean pH of 0.1 units corresponds to a 30% increase in the concentration of H+ in seawater, assuming that alkalinity and temperature remain constant.



Hence we get the claim that "the ocean" has become **30% more acidic** since the start of the industrial revolution. There are actually four oceans, five counting the Southern ocean and all are different. There can be no single pH value for the world's oceans, any more than there can be a single surface-air temperature for the globe. The range of pH can vary extensively as described here:

Chris Jury¹³, Center for Marine Science, Biology and Marine Biology, University of North Carolina,

"On some reef flats pH values have been measured to vary from as low as 7.8 to as high as 8.4 in a single 24 hr period (Yates and Halley, 2006). In some lagoons, pH has been measured to vary as much as 1 pH unit in a day (e.g., 7.6 to 8.6). Seasonal and even multi-decadal cycles of pH variation in reef water have also been measured (Pelejero et al., 2005). While some of the pH values that organisms see in the field may be less than ideal for growth, many are able to tolerate a fairly wide range of pH values, at least for short periods of time." (meaning decades, not days or weeks,).

Dr. CALDEIRA¹⁴

Dr. Caldeira has a prominent role in the NRDC film and is Senior Scientist at the Department of Global Ecology at the Carnegie Institution for Science, based at Stanford, Ca.

(The Carnegie Corporation of New York, parent body of the Institution, is highlighted in the current media investigations¹⁵ into the UN's Intergovernmental Panel on Climate Change (IPCC).

He is a member of just about every committee and panel discussing ocean acidification and geo-engineering, including the UK and Europe and is widely quoted. He is a fervent proponent of the AGW theory and is heavily involved in promoting geo-engineering.¹⁶ In fact he is the Lead Author for the IPCC Special Report on CO2 Capture and Storage, Oceans Chapter, Coordinating Lead Author (2005) and has

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testified to the UK Parliament and to the US Congress on geo-engineering.

PRODUCING CONSENSUS

Once the scare had been introduced, it grew legs and had to be nourished and in 2005, the Royal Society published a report entitled, **Ocean acidification due to increasing atmospheric carbon dioxide.**¹⁷

The members of the committee producing that report included one Dr. Ken Caldeira, at that time at Lawrence Livermore laboratory. He was accompanied by scientists from the University of East Anglia, Southampton University and Plymouth Marine Laboratory, both the latter institutions are part of the UK Tyndall Centre for Climate Change Research, the main body in the UK promoting draconian emissions control on behalf of the UK government.

Their report is critiqued here by Gerald E. Marsh, Argonne National Laboratory (Ret) in a selfpublished paper, **Seawater pH and Anthropogenic Carbon Dioxide.**¹⁸

He finds that:

The Royal Society pH estimate for 2100 is thus consistent with a linear extrapolation of the eighteen years of data from Ocean Station Aloha. Such an extrapolation would appear to be unwarranted or questionable at best.

He then mentions Calder and Wicket, probably not realising that the Royal Society report is essentially their paper re-hashed, with the main author sitting on the committee producing it. This time he concludes that

... the eighteen years of Ocean Station Aloha or similar data appear to have been linearly extrapolated out to 2300. This is even more questionable than a linear extrapolation to 2100.

So the basis of all the hype is a calculation from an estimate, which gives a precise figure of



o.1pH decrease, they don't even know the consequences of changes in pH, and the conclusions they reach are based on an extrapolation of eighteen years of data from one Pacific ocean station.

The Royal Society produced a cut and paste updated report in 2007, and again in 2009, with the same panellists. Thus is consensus achieved and acidification of the oceans is now fact, the science is settled. Who would question the wise science from

an august and venerable body such as this? The culmination of 350 years of scientific stewardship is epitomised here:

Public Symposium: Rising to the Climate Challenge - Artists and Scientists Imagine Tomorrow's World19, 20 March 2010, Venue: Tate Modern Starr Auditorium, London

Tate and the Royal Society collaborate by bringing together scientists and artists to imagine the social and psychological impacts of climate change. On 19 and 20 March, **Tate and the Royal Society** collaborate to bring you a screening of the film **The Age of Stupid** following, (sic) by a discussion and a public symposium about the social and psychological impacts of climate change.

THE LANGUAGE OF CATASTROPHE

This is how ocean acidification is defined by the IPCC Working Group II Report "Impacts, Adaptation and Vulnerability" Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds).

Definition - Ocean acidification Increased concentrations of CO₂ in sea water causing **a measurable increase in acidity (i.e.,** a reduction in ocean pH). This **may** lead to reduced calcification rates of calcifying organisms such as *corals*, molluscs, *algae* and crustacea.

The **UK Natural Environment Research Council**²⁰ is the main UK body in charge of funding research into the Natural Environment, which effectively means anything perceived to warrant the labels, "global warming" or "climate change". Their web site discusses ocean acidification. They do acknowledge recent research which runs counter to the claims, but say that more research is required. Interestingly they include NGO's in this process: The UK Natural Environment Research Council is the main UK body in charge of funding research into the Natural Environment, which effectively means anything perceived to warrant the labels, "global warming" or "climate change".

Scientists from across Europe are working with representatives of organisations ranging from BP and Rolls Royce to WWF and Greenpeace.

NERC notes that:

Dr. Ken Caldeira and Dr. Michael Wickett from Lawrence Livermore National Laboratory in the US were among the first to point out the problem in a Nature paper in 2003. This was followed up by a Royal Society report two years later.

Before these studies, researchers had tended to think ocean acidity remained fairly constant, and that the ocean could absorb large amounts of carbon without coming to harm.

The United Nations Intergovernmental Panel on Climate Change (IPCC) **predicted** in its 2007 fourth Assessment Report that ocean pH **will** fall by a further 0.14 to 0.35 units over the 21st century. 'While the effects of **observed ocean acidification** on the marine biosphere **are as yet undocumented**, the **progressive acidification of oceans** is **expected** to have negative impacts on

marine shell-forming organisms (e.g. corals) and their dependent species,' it added.

The use of language again is important here, NERC use the word **"predicted"**, yet what they are talking about are yet more modelling scenarios, computer simulations dependent for

They talk of observed ocean acidification, but as the scientific review by Craig Idso (SPPI) shows, they have observed nothing of the kind. their output on the assumptions put into them.

They are incapable of predicting anything, but the language has established a perceived scientific certainty; ocean pH will fall by the specified amount from the models. They talk of **observed** ocean acidification, but as the scientific review by Craig Idso (SPPI) shows, they have observed nothing of the kind, yet they promote the idea of the **progressive acidification** of the oceans and they have no evidence of any effects of lowered pH.

This use of language is vital in manipulating public perception and a blog comment at Real Climate²¹

shows how the issue is to be addressed when valid concerns are raised that pH above 7 is not acid:

"... surface ocean pH is estimated to have dropped from near 8.25 to near 8.14 between 1751 and 2004... Given that a pH over 7 is basic, how is this an acidification? Looks like it is neutralizing.

Response: You have this backwards. A pH LESS THAN 7 is acid. So 8.14 is more acidic than 8.25.

So a pH more than 7 is also acid, cold is hot, the earth is heating up, sea levels are rising rapidly, Himalayan glaciers will be gone by 2035, black is white and everything is worse than we thought.

In order to influence policy we have to have scary language, because nothing attracts policy makers and the media like scientific scares. Perhaps Dr. Caldeira has learned a few lessons from his Stanford colleagues, Dr. Stephen Schneider and Dr. Paul Ehrlich.

IPCC CONSENSUS

The control of issues like this within IPCC by small groups of motivated scientists is shown

In order to influence policy we have to have scary language, because nothing attracts policy makers and the media like scientific scares. Perhaps Dr. Caldeira has learned a few lessons from his Stanford colleagues, Dr. Stephen Schneider and Dr. Paul Ehrlich. again here:

At the 29th Session of the IPCC (31 August - 4 September 2008 - Geneva, Switzerland), new Working Group II co-chairs were elected to oversee development of the Impacts, Adaptation, and Vulnerability volume of the Fifth Assessment Report: **Dr. Chris Field** of the United States and Dr. Vicente Barros of Argentina.

Dr. Field is the founding director of the Carnegie Institution's Department of Global Ecology where Dr. Caldeira is based. The Technical Support Unit, (TSU) for WGII is also based at the Carnegie Institution. This is how the WGII home describes the role of the TSU:

The TSU plays a **strong scientific leadership** role, both **in content for Expert Meetings, Special Reports, and the Fifth Assessment Report,** as well as in management of the complex communications and implementation associated with IPCC activities. The TSU facilitates the work of the hundreds of volunteer authors and participants who contribute to these products, and ensures wide dissemination of the findings to a broad range of audiences – from the lay public and students to the scientific community and an array of stakeholders.

There is little doubt that ocean acidification will be there again in AR5 but probably worse than we thought and the story is already in place.

The next IPCC assessment will benefit from more ocean science²²:

"We now know that **increasingly acidic seas** are reducing coral reef health and changing ocean ecosystems. But will the increasing CO₂ uptake by the ocean and warmer oceans also bring risks for all life on Earth?"

"SHOCKUMENTARIES"

"Acid Test" is one of a long line of documentary style environmental disaster films, some of them fictional and some purportedly factual. The China Syndrome, Erin Brokovitch and The Day After Tomorrow come to mind, with Al Gore's An Inconvenient Truth leading the field.

"Acid Test" is one of a long line of documentary style environmental disaster films, some of them fictional and some purportedly factual. More recently we have had the Age of Stupid²³, with politicians jumping on the bandwagon.

Team Oz & NZ prepared for the Australia & New Zealand premiere on August 19th 2009 and then on 1st September 2009, the Not Stupid crew launched their 10:10 climate campaign²⁴ at London's Tate Modern. "Ten Ten" asks everyone to commit to cut their emissions by 10% in 2010 - and within 48 hours 12,000 people, 300 businesses, 50 schools, all the Cabinet and the Prime Minister had signed up. The film's producer is the daughter of Peter Armstrong, a former BBC producer, co-founder of the OneWorld Network²⁵ and director for the OneWorld International Foundation²⁶, an environmental activist grouping, integrated into the UN NGO system.

THE POLITICIANS

Jane Lubchenco, NOAA Administrator, in an interview in July last year, with Yale Environment 360²⁷, referred to ocean acidification as global warming's "equally evil twin."

The oceans are indeed becoming more acidic, as a result of absorbing carbon dioxide from the atmosphere, and that acidity represents a very real threat to much of the life in oceans, ranging from the smallest microscopic plants, to

coral reefs, to things that form shells — mussels, oysters, clams but even things like lobsters and crabs.

This is the language presented to politicians and to the media and is re-iterated thousands of times across the internet via NGO blog sites and media sites in the timeworn phrase, "scientists say". Following on obediently, the Democrats have this Bill currently going through the senate.

S.173 - Federal Ocean Acidification Research And Monitoring Act of 2009²⁸ This is the language presented to politicians and to the media and is re-iterated thousands of times across the internet via NGO blog sites and media sites in the timeworn phrase, "scientists say".

A bill to establish an interagency committee to develop an ocean acidification research and monitoring plan and to establish an ocean acidification program, (sic) within NOAA.

NON-IPCC SCIENCE

NERC was quoted earlier, saying that:

"Before these studies, researchers had tended to think ocean acidity remained fairly constant, and that the ocean could absorb large amounts of carbon without coming to harm."

In reality nothing has changed, but the 2003 Nature paper by **Caldeira** and Wickett gave rise to a new paradigm of catastrophe, which has supplanted previously accepted research on the oceans. For example, the chemistry of the oceans has been known for many years, it hasn't just been invented by the IPCC; Limnology and Oceanography 958 November 1972, V. 17:

...alkalinity already present in seawater can prevent severe pH excursions for periods of thousands of years even when reverse weathering is neglected. If reverse weathering is taken into account, then the buffering capacity of the CO2 system extends for much longer periods. The actual pH of seawater is fixed by any two relevant quantities and, as the alkalinity is controlled by the input of HCo3- from weathering and the biogenic output of CaCo3 and the Pco, below the thin wind-mixed layer is controlled by oxidation, the pH is determined primarily by biological processes. Of course, geochemical events, such as weathering ... and chemical equilibria also play a role.

IPCC Working Group I claim to present the physical science. Why then do they not present the physical science so eminently laid out by Dr. Craig Idso.²⁹

CONCLUSION

It seems the current acid ocean scare has been fed by the Caldeira and Wicket paper from 2003. The use of the word acidic to describe levels that are still alkaline is designed to ramp

the seas³⁰:

health, international oceans governance,

and adaptation of

marine and coastal

environments

It seems the current acid ocean scare has been fed by the Caldeira and Wicket paper from 2003. The use of the word acidic to describe levels that are still alkaline is designed to ramp up the scare element.

ocean acidification.

Two legislative initiatives are 'Oceans 21' and the Lieberman-Warner Climate Security Act of 2008. These are important bills that would go a long way towards conserving our oceans and coasts, providing coordination and funding to federal, state and local efforts to protect, maintain and restore marine

climate change and 'Oceans 21' and the ccurity Act of 2008. would go a long way and coasts, providing ederal, state and local

They are aided and

abetted by the

up the scare element. Yet again the IPCC demonstrates that they are purely a political arm of

the UN, using flimsy global warming/climate change evidence to persuade governments that global

governance via the UN is the future for the world population. They are aided and abetted by the major

NGO's whose goal in this instance, is UN control of

WWF is working on a number of important pieces of legislation affecting oceans that are

being considered in the current Congress legislation addressing marine ecosystem

to

ecosystem health, especially in light of climate change. I have also been working to encourage the U.S. Senate to ratify the United Nations Convention

on the Law of the Sea (UNCLOS) - a treaty that solidifies the international legal framework that governs the world's oceans.

Anyone who has studied fishing policies and the horrendous decimation of stocks due to bycatch legislation, especially in the European Union, knows that bureaucratic control of the

oceans would lead to serious consequences for both marine species and humans. The other aspect is that UN control of the seas would also mean UN control of future prospective oil discoveries. The role of NGO's³¹ in the IPCC process is only now starting to become more apparent.

Update

USF STUDY SHOWS FIRST DIRECT EVIDENCE OF OCEAN ACIDIFICATION^{32,33} January 20, 2010, Physorg.com

The presentation implies that this is a new research study, but it was actually first reported in **2006:**

The other aspect is that UN control of the seas would also mean UN control of future prospective oil discoveries. The role of NGO's in the IPCC process is only now starting to become more apparent.

Research in Pacific shows ocean trouble³⁴, Acidity rises, oxygen drops, scientists find, Seattle P-I

"Research fresh off a boat that docked Thursday in Alaska reveals **some frightening changes** taking place in the Pacific Ocean."

The study was based on 15 years of measurement "in a vast and deep section of the northeastern Pacific Ocean" claims to show the **first direct evidence of** increased acidity brought on by manmade carbon dioxide in the atmosphere.

The time scale is the same, the results are the same and the ship is the same, although in this new presentation, different scientists are quoted. The trip was part of the Repeat Hydrography project. Thirty-five scientists from about a dozen universities and government labs participated. I suppose they could present it several times more until all thirty five have been quoted.

The researchers found that upper-ocean pH had, over the preceding one-anda-half decades, decreased by approximately 0.026 units, equivalent to an average annual pH change of -0.0017, over a large section of the northeastern Pacific.

"The pH decrease is direct evidence for ocean acidification of a large portion of the North Pacific Ocean," said Richard Feely. "These dramatic changes **can**

be attributed, in most part, to anthropogenic CO2 uptake by the ocean over a 15-year period."

So a change of -0.0017 annual pH change over 15 years is "dramatic" and can be attributed

Anything can be attributed to anything, just by the statement,

"scientists believe".

to anthropogenic CO₂. Anything can be attributed to anything, just by the statement, "scientists believe".

However we know that: "Seasonal and even multidecadal cycles of pH variation in reef water have also been measured" (Pelejero et al., 2005). So how can 15 years of variation be direct evidence of acidification.

"Estimates of future atmospheric and oceanic CO2 concentrations, based on the Intergovernmental Panel on Climate Change

emission scenarios and general circulation models, indicate that by the middle of this century atmospheric CO2 levels could reach more than 500 ppm, and near the end of the century they could be over 800 ppm. Current levels are near 390 ppm, and pre-industrial levels were near 280 ppm," Feely said.

Corresponding models for the oceans indicate that surface water pH would drop approximately 0.4 pH units, and the carbonate ion concentration would decrease almost 50 percent by the end of the century. This surface ocean pH would be lower than it has been for more than 20 million years.

Demico et al³⁵ show that atmospheric CO2 rose as high as 2500 ppm between 60 and 40 Ma and Caldeira and Wicket say that there is no evidence for a greater than 0.6 decrease in pH in

the last 300 Ma, so even with CO2 levels six and a half times greater than today, the oceans were still not acid.

There is again a focus on carbonate concentration whereas it has been shown that bi-carbonate availability is the prime consideration in calcification rates of corals and other animals – Kleypas et al³⁶:

... HCO³⁻ is the preferred substrate for coral

Even with CO2 levels six and a half times greater than today, the oceans were still not acid.

photosynthesis (Al-Moghrabi et al., 1996; Goiran et al., 1996; Allemand et al., 1998), coral calcification uses both HCO^{3-} from seawater and metabolic CO₂ as sources of carbon (Erez, 1978; Furla et al., 2000)... Biochemical studies fail to provide any evidence that $CO3^{2-}$ plays a direct role in coral calcification... Results from several studies indicate that the substrate for calcification in E. huxleyi is HCO^{3-} (cf., Paasche, 2001), which increases under elevated pCO₂ conditions...

USE OF EXTREME FIGURES

The figure of 800 ppm for end of century atmospheric CO2 implies an annual rate of increase

The figure of 800 ppm for end of century atmospheric CO2 implies an annual rate of increase from today of over 4.5ppm, whereas the average annual increase from 1980 to 2009 is 1.6ppm. Such fanciful projections are again designed to ramp up the fear factor. from today of over 4.5ppm, whereas the average annual increase from 1980 to 2009 is 1.6ppm. Such fanciful projections are again designed to ramp up the fear factor. Dr. Feely is an IPCC author and is a firm believer in climate dangerous change resulting from anthropogenic CO2 and has called for reductions of 80% in CO₂ emissions.

One wonders at the reason for the re-appearance of this study, almost in disguise as it were, at a time when the integrity of the IPCC AR4

is under intense scrutiny and Senators are under extreme pressure to pass cap and trade legislation.



ENDNOTES

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- 2. <u>http://www.nrdc.org/about/</u>.
- 3. <u>http://www.hindu.com/2009/12/11/stories/2009121151940900.htm</u>.
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