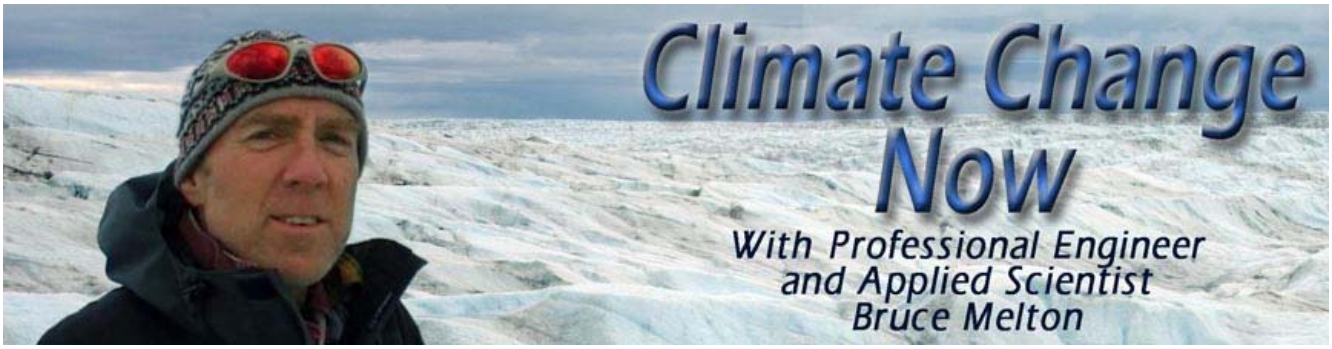

November 13, 2008 **Ocean Acidification 40 to 60 Years Ahead of Schedule -VERY ALARMING!**

It is really difficult to single out any one issue in the climate crisis that may be most important, but this may be ocean acidification may be the one. It might just be more important than desertification, increasing hurricane intensity, massive insect infestations and sea level rise. Acidification in the great southern ocean will likely cross a point of no return by the year 2030 to 2038 at the latest.

A new article in the Proceedings of the National Academies of Science, published by a scientists named McNeil from the University of New South Wales in Australia, has discovered that the great Southern Ocean is acidifying 42 to 62 years faster than predicted. The extra carbon dioxide that mankind adds to the atmosphere mixes easily with water and as it does, turns into carbolic acid, which in turn makes the water more acidic. This is not acidic to the extent of battery acid, or even orange juice, but it changes the water chemistry - it changes the environment that ocean animals live in. Ocean waters, over broad regions, have been remarkably, stable when it comes to acidity, for several million years. Unfortunately, the basic building blocks of our great Earth's biologic machine - the phytoplankton, or ocean algae, are quite sensitive to changes in ocean acidity. Think of this concept as if we were to change the world's deserts to tropical forests - all of the cactus would soon rot. If the changes were widespread enough, all of those cactus species would likely go extinct because cacti, in general, do not survive in moist wet conditions.

The phytoplankton collectively are called "primary biologic productivity". They are mostly single celled green plants or algae and they are the smallest prey item in the food chain. They are what the smallest animals eat, so they are very important to virtually every animal in the ocean and many on land. They also create oxygen and capture carbon - as a part of the natural function of photosynthesis. Most species are single celled free-floating algae that give many ocean waters (freshwaters too) a greenish tint. These algae account for the single largest way that our planet deals with excess carbon dioxide. They use carbon dioxide, just like green plants on land, to create energy and in the process expel oxygen as a waste product. When they die, their dead cell walls, in untold numbers, float to the bottom of the sea where the carbon used in their construction is buried for hundreds of millions of years.

Because of the extraordinary things that we 6.5 billion humans are doing to our atmosphere, our ocean's acidity is increasing. These new discoveries have allowed us to understand that it will increase much faster than previously understood and that the threshold for ecosystem wide impacts is lower than we previously thought at 450 ppm atmospheric carbon dioxide (the previous assumption was 550 ppm). What this means is that may be a mass extinction of phytoplankton in our great southern ocean by the year 2030 and as the research paper by McNeil states, most certainly by 2038. This gives us much, much less time to find and implement a solution.

Primary productivity, concentrated in the most productive waters nearer to the polar areas, accounts for 50% of the oxygen generated on the planet and 50% of the carbon dioxide natural absorbed by the biosphere. The Great Southern Ocean will be affected first because of the polar amplification effect. This is not a good thing because by far, the greatest amount of ocean productivity comes from the cooler waters closer to the poles. It is here that the algae survive in much greater abundance than in tropical and subtropical waters, and because of that much greater abundance - this is where the greater amount of carbon capture and oxygen production come from. This is where the greatest impacts will be and where the greatest amount of extinctions will occur.

The bottom-line is: McNeil states that the tipping point, or environmental threshold, for the Southern Ocean is 450 ppm CO2 in the atmosphere (today's concentration is 385 and rising at 2.2 ppm per year at an increasing rate). If we were to stop emitting all carbon dioxide today, the atmospheric concentration will still rise to 450 (and then start to fall). Does this mean we skate? NO! Impacts begin before 450 ppm. We cannot tell how large these impacts will be, or what the effects of this unknown loss of primary productivity on the planet will be. We will certainly be affected by some amount of loss of phytoplankton - oxygen production will decline and carbon dioxide absorption will fall, creating a greater CO2 concentration in the atmosphere and more acidification amplifying the problem further in what is called a feedback loop. The feedback loop works like a population explosion. More CO2 means more ocean acidity, means more CO2, etc.

So if CO2 concentration goes above 450 ppm, this tipping point is reached and the impacts occur more rapidly - how much more rapidly, again, it's hard to say - but likely it will be much more rapidly, with much more extreme impacts. McNeil states that the IPCC models puts us at 450 ppm by 2030, in a worse case scenario and 2038 if we take moderately aggressive action towards limiting CO2 emission.

How extensive will be the impacts? We aren't really sure yet. We understand the implications of massive ocean extinctions. Once the primary food is gone, impacts cascade up the chain. The tiniest fishes no longer have food, which leads to big problems up the food chain. We also understand that oxygen generation will suffer, but the problem has just not been studied enough to know what will happen. Suffice it to say, it won't be good.

We need to really be paying attention what scientists are saying about climate change. It is quite possible that we have crossed a climate threshold, where the entire climate begins changing much more rapidly. This could account for the reason why the super computer climate models have been shown to be projecting our future climate so much more conservatively lately. Not only is the great southern ocean changing 40 to 60 years ahead of projections, but Arctic Sea ice is doing the same. Antarctica, just ten years ago was assumed by virtually all scientists to be a stable ice place, not losing ice and melting and possibly even gaining ice volume. But new ultra sensitive gravity measuring satellites, 100 times more accurate than the previous generation, have now shown that in the last ten years, not only has Antarctica started losing ice, but it has caught up with Greenland.

On top of all of this 37 million acres of pine have been killed in North America in an insect infestation unprecedented in history, permafrost may very well have started atmospheric methane concentrations (methane is 21 time more powerful of a greenhouse gas than CO2) increasing again after current advanced agricultural practices seemed to have brought methane under control. Frozen methane on the ocean floor, enough to more than equal all of the oil, coal, oil shale, tar sands and natural gas ever extracted from the ground and all that is known to remain in the ground has started to melt, and the atmospheric concentration of carbon dioxide is increasing so fast it is equal to the worse case scenario used in the IPCC models for the year 2100.

This is all quite real and in reality is likely even worse than it sounds. This issue is so important that it dwarfs the latest issue to dwarf the latest issue. Once the Iraq war was the most extraordinary event to happen in decades. Then the economic crisis was the most extraordinary event to happen in nearly a century. Now, the climate crisis is the most extraordinary event to happen in millennia. Unexpected impacts like the acceleration of the ocean acidification will continue to happen and make climate change that much more difficult to address. It's time to act.

We can address this crisis. The scientists have been telling us that we need to have extraordinary things accomplished by 2012 or 2013 and ALL of our COAL emissions must be 100% sequestered by 2020 to 2030. This kind of effort is orders of magnitude more aggressive than Kyoto. It can be accomplished, but it will not be easy.

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