

Godbold and Calosi, the first of the papers you have attached, deal with the extent of ocean “acidification” only in the introduction to their paper, which – like so many on climate-related subjects – prefers to take the supposed problem as a given and then expatiate on its consequences, rather than to check whether there is a problem.

They begin by asserting that “further increases” in Co2 concentration “(700-1000 ppm)” are “anticipated by the end of the twenty-first century”. However, analysis of Fig. 10.26 on page 803 of IPCC (2007), where the underlying data are not available but I superimposed a fine grid on each graph to reconstruct the original data, shows that 700  $\mu\text{atm}$  (not “ppm”, which, by omitting the necessary reference to volume, is misleading, as well as not being a *Systeme Internationale* unit) is the IPCC’s *central* estimate of CO2 concentration by 2100, not its *lower bound*.

Next, the two propagandists say, “Over the past three decades, changes in [CO2] have increased global average temperatures (approx. 0.2 C decade), ...”. Well, I beg leave to modify their aetiology and also their quantity. First, the aetiology. As best I can make it out on the basis of analyzing the bomb-test curve, almost 40% of the increase in CO2 over the past three decades was not attributable to Man.

Large-scale atmospheric nuclear testing ceased in 1963. The testing approximately doubled the previously-stable baseline atmospheric concentration of  $^{14}\text{C}$ , which rapidly reverted towards the baseline over 50 years, after which time less than 5% of the excess remained in the atmosphere. Observations of  $\Delta^{14}\text{C}$ , expressed as the remaining airborne fraction of the excess, are at Fig. 1.

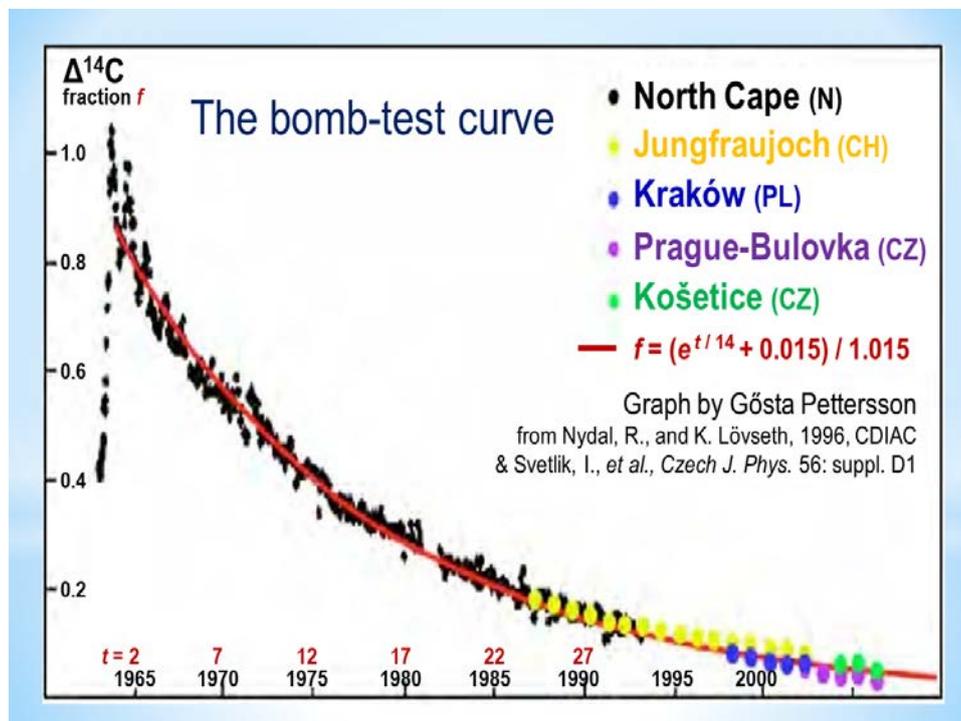


Figure 1. The decay curve of atmospheric  $^{14}\text{C}$  following the ending of nuclear bomb tests in 1963, assembled from European records by Gösta Pettersson.

Reversible reactions tend towards an equilibrium defined by a constant  $k$ . Emission into a reservoir perturbs the equilibrium, whereupon relaxation drains the excess from the reservoir, re-establishing equilibrium over time. Where  $\mu$  is the rate-constant of decay, (1) gives the fraction  $f_t$  remaining in the reservoir at any time  $t$ .

$$f_t = (e^{-\mu t} + k)/(1 + k). \quad (1)$$

The IPCC's current estimates (fig. 2) of the pre-industrial baseline contents of the carbon reservoirs are 600 PgC in the atmosphere, 2000 PgC in the biosphere, and 38,000 PgC in the hydrosphere. Accordingly  $k$ , equivalent to the baseline pre-industrial ratio of atmospheric to biosphere and hydrosphere carbon reservoirs, is  $600/(2000+38000)$ , or 0.015. Empirically, Petterson finds the value of  $\mu$  to be about 0.07, giving a relaxation time (the reciprocal of the rate-constant of decay) of approximately 14 years and yielding the red curve coincident with the data in fig. 1. Annual values of  $f_t$  determined from (1) are at table 1.

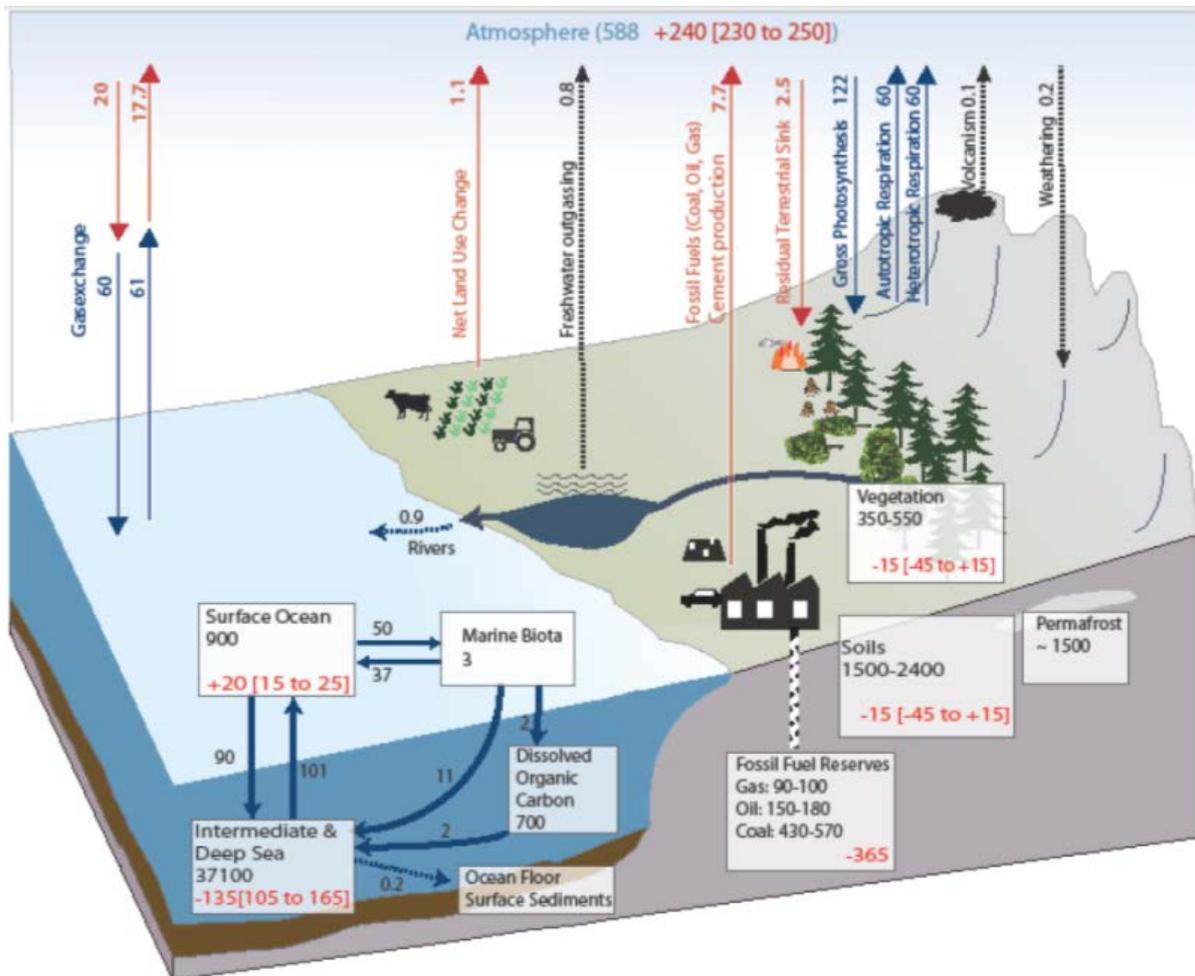


Figure 2. The global carbon cycle. Numbers represent reservoir sizes in PgC, and carbon exchange fluxes in PgC yr<sup>-1</sup>. Dark blue numbers and arrows indicate estimated pre-industrial reservoir sizes and natural fluxes. Red arrows and numbers indicate fluxes averaged over 2000–2009 arising from CO<sub>2</sub> emissions from fossil fuel combustion, cement production and land-use change. Red numbers in the reservoirs denote cumulative industrial-era changes from 1750–2011. Source: IPCC (2013), Fig. 6.1.

1	.932	.869	.810	.755	.704	.657	.612	.571	.533	.497
11	.464	.433	.404	.377	.362	.329	.307	.287	.268	.251
21	.235	.219	.205	.192	.180	.169	.158	.148	.139	.130
31	.122	.115	.108	.102	.096	.090	.085	.080	.076	.071
41	.067	.064	.060	.057	.054	.052	.049	.047	.045	.042
51	.041	.039	.037	.036	.034	.033	.032	.030	.029	.028
61	.027	.027	.026	.026	.024	.024	.023	.022	.022	.021
71	.021	.021	.020	.020	.019	.019	.019	.019	.018	.018
81	.018	.018	.017	.017	.017	.017	.017	.017	.016	.016
91	.016	.016	.016	.016	.016	.016	.016	.016	.016	.016
101	.016	.015	.015	.015	.015	.015	.015	.015	.015	.015
111	.015	.015	.015	.015	.015	.015	.015	.015	.015	.015

Table 1. Annual fractions of the excess remaining airborne following the bomb-test curve of <sup>14</sup>C decline as described by (1).

As Table 1 demonstrates, the residence half-life of atmospheric <sup>14</sup>C is about ten years, confirming a point Gordon Fulks made to you in his reply and making the mad IPCC's estimate of a mean CO<sub>2</sub> residence time of 50-200 years look very silly. There is no particular reason to suppose that uptake of <sup>12</sup>C and <sup>13</sup>C by the biosphere and hydrosphere will be any less rapid than that of <sup>14</sup>C.

Using CDIAC data, I have converted to  $\mu\text{atm}$  and summed the annual increments in CO<sub>2</sub> emission from fossil fuels from 1751-2010 and from land-use changes from 1850-2000. I have assumed a straight-line increase in land-use changes from 1751-1849 and an annual land-use emission equivalent to 1  $\mu\text{atm yr}^{-1}$  from 2001-2010. I have then applied the values in Table 1 to each annual increment, distributing the decay across all subsequent years to 2010. The data are at Table 2.

Fossil-fuel emissions in ppmv											Land use emissions in ppmv										
1751	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	1751	0.0024	0.0048	0.0071	0.0095	0.0119	0.0143	0.0166	0.0190	0.0214	0.0238
1761	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	1761	0.0261	0.0285	0.0309	0.0333	0.0357	0.0380	0.0404	0.0428	0.0452	0.0475
1771	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	1771	0.0499	0.0523	0.0547	0.0571	0.0594	0.0618	0.0642	0.0666	0.0689	0.0713
1781	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	1781	0.0737	0.0761	0.0784	0.0808	0.0832	0.0856	0.0880	0.0903	0.0927	0.0951
1791	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	0.0028	1791	0.0975	0.0998	0.1022	0.1046	0.1070	0.1094	0.1117	0.1141	0.1165	0.1189
1801	0.0038	0.0047	0.0043	0.0043	0.0043	0.0047	0.0047	0.0047	0.0047	0.0047	1801	0.1212	0.1236	0.1260	0.1284	0.1307	0.1331	0.1355	0.1379	0.1403	0.1426
1811	0.0052	0.0052	0.0052	0.0052	0.0057	0.0061	0.0066	0.0066	0.0066	0.0066	1811	0.1450	0.1474	0.1498	0.1521	0.1545	0.1569	0.1593	0.1616	0.1640	0.1664
1821	0.0066	0.0071	0.0076	0.0076	0.0080	0.0080	0.0085	0.0085	0.0085	0.0113	1821	0.1688	0.1712	0.1735	0.1759	0.1783	0.1807	0.1830	0.1854	0.1878	0.1902
1831	0.0109	0.0109	0.0113	0.0113	0.0118	0.0137	0.0137	0.0142	0.0147	0.0156	1831	0.1926	0.1949	0.1973	0.1997	0.2021	0.2044	0.2068	0.2092	0.2116	0.2139
1841	0.0161	0.0170	0.0175	0.0184	0.0203	0.0203	0.0217	0.0222	0.0236	0.0255	1841	0.2163	0.2187	0.2211	0.2235	0.2258	0.2282	0.2306	0.2330	0.2353	0.2377
1851	0.0255	0.0269	0.0279	0.0326	0.0336	0.0359	0.0364	0.0369	0.0392	0.0430	1851	0.2341	0.2603	0.2593	0.2582	0.2568	0.2592	0.2617	0.2642	0.2666	0.2691
1861	0.0449	0.0459	0.0492	0.0530	0.0563	0.0577	0.0615	0.0638	0.0671	0.0695	1861	0.2747	0.2469	0.2469	0.2469	0.2470	0.2470	0.2461	0.2452	0.2442	0.2435
1871	0.0738	0.0818	0.0870	0.0823	0.0889	0.0903	0.0917	0.0927	0.0993	0.1116	1871	0.2529	0.2934	0.2980	0.3006	0.3036	0.3068	0.3095	0.3121	0.3146	0.3172
1881	0.1149	0.1210	0.1286	0.1300	0.1310	0.1329	0.1395	0.1546	0.1546	0.1683	1881	0.3332	0.3106	0.3120	0.3127	0.3133	0.3137	0.3130	0.3120	0.3113	0.3106
1891	0.1759	0.1768	0.1749	0.1811	0.1920	0.1981	0.2080	0.2198	0.2397	0.2525	1891	0.3089	0.3155	0.3161	0.3245	0.3265	0.3274	0.3289	0.3294	0.3300	0.3294
1901	0.2610	0.2676	0.2917	0.2950	0.3135	0.3343	0.3707	0.3546	0.3711	0.3872	1901	0.3592	0.3593	0.3710	0.3811	0.3907	0.4028	0.4046	0.4065	0.4076	0.4080
1911	0.3953	0.4156	0.4458	0.4019	0.3962	0.4260	0.4515	0.4425	0.3811	0.4406	1911	0.3831	0.3653	0.3506	0.3445	0.3365	0.3349	0.3334	0.3326	0.3343	0.3341
1921	0.3796	0.3995	0.4586	0.4553	0.4610	0.4648	0.5021	0.5035	0.5413	0.4978	1921	0.3568	0.3523	0.3552	0.3572	0.3579	0.3596	0.3778	0.3787	0.3783	0.3795
1931	0.4444	0.4005	0.4222	0.4600	0.4856	0.5343	0.5716	0.5399	0.5636	0.6142	1931	0.3872	0.3862	0.3844	0.3780	0.3761	0.3794	0.3679	0.3686	0.3667	0.3596
1941	0.6307	0.6345	0.6576	0.6539	0.5484	0.5853	0.6581	0.6945	0.6709	0.7706	1941	0.3589	0.3703	0.3693	0.3732	0.3753	0.4147	0.4249	0.4326	0.4363	0.4423
1951	0.8354	0.8487	0.8704	0.8818	0.9654	1.0293	1.0732	1.1016	1.1602	1.2146	1951	0.5454	0.5734	0.5729	0.5979	0.6203	0.6475	0.6597	0.6715	0.6240	0.6154
1961	1.2198	1.2699	1.3394	1.4160	1.4798	1.5545	1.6042	1.6860	1.7871	1.9162	1961	0.6663	0.6734	0.6830	0.6952	0.7048	0.7228	0.7243	0.7313	0.7365	0.7268
1971	1.9895	2.0689	2.1814	2.1857	2.1729	2.2996	2.3762	2.4051	2.5384	2.5129	1971	0.6712	0.6551	0.6707	0.6722	0.6760	0.7440	0.7613	0.7631	0.7711	0.7600
1981	2.4358	2.4174	2.4084	2.4963	2.5715	2.6509	2.7195	2.8202	2.8826	2.8968	1981	0.8087	0.9090	0.9375	0.9637	0.9770	0.9983	1.0080	1.0168	1.0180	1.0203
1991	2.9393	2.9143	2.9133	2.9625	3.0249	3.0930	3.1445	3.1407	3.1251	3.1984	1991	1.1232	1.0589	1.0513	1.0412	1.0247	1.0101	0.9983	0.9865	0.9769	0.9840
2001	3.2750	3.3076	3.5062	3.6911	3.8263	3.9572	4.0499	4.1525	4.1322	4.3341	2001	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table 2. CDIAC fossil-fuel and land-use emissions, 1750-2010, expressed in  $\mu\text{atm}$

Combined emissions in ppmv

1751	0.0038	0.0062	0.0085	0.0109	0.0133	0.0157	0.0181	0.0204	0.0228	0.0252
1761	0.0276	0.0299	0.0323	0.0347	0.0371	0.0395	0.0418	0.0442	0.0466	0.0490
1771	0.0518	0.0542	0.0566	0.0589	0.0613	0.0637	0.0661	0.0685	0.0708	0.0732
1781	0.0761	0.0784	0.0808	0.0832	0.0856	0.0879	0.0903	0.0927	0.0951	0.0975
1791	0.1003	0.1027	0.1051	0.1074	0.1098	0.1122	0.1150	0.1174	0.1198	0.1226
1801	0.1250	0.1283	0.1302	0.1326	0.1350	0.1379	0.1402	0.1426	0.1450	0.1474
1811	0.1502	0.1526	0.1550	0.1573	0.1602	0.1630	0.1659	0.1683	0.1706	0.1730
1821	0.1754	0.1782	0.1811	0.1835	0.1863	0.1887	0.1916	0.1939	0.1963	0.2015
1831	0.2034	0.2058	0.2087	0.2110	0.2139	0.2181	0.2205	0.2234	0.2262	0.2295
1841	0.2324	0.2357	0.2386	0.2419	0.2462	0.2485	0.2523	0.2552	0.2590	0.2632
1851	0.2596	0.2872	0.2872	0.2908	0.2904	0.2952	0.2981	0.3011	0.3059	0.3121
1861	0.3196	0.2928	0.2960	0.2999	0.3033	0.3047	0.3076	0.3090	0.3114	0.3130
1871	0.3266	0.3752	0.3850	0.3829	0.3925	0.3971	0.4012	0.4047	0.4139	0.4287
1881	0.4481	0.4317	0.4406	0.4427	0.4443	0.4466	0.4525	0.4666	0.4659	0.4789
1891	0.4848	0.4923	0.4910	0.5056	0.5184	0.5255	0.5369	0.5493	0.5697	0.5819
1901	0.6202	0.6269	0.6627	0.6762	0.7042	0.7371	0.7753	0.7611	0.7787	0.7953
1911	0.7783	0.7809	0.7964	0.7463	0.7327	0.7609	0.7849	0.7751	0.7154	0.7748
1921	0.7364	0.7518	0.8138	0.8125	0.8189	0.8244	0.8799	0.8822	0.9196	0.8774
1931	0.8316	0.7866	0.8066	0.8380	0.8616	0.9136	0.9395	0.9085	0.9303	0.9738
1941	0.9896	1.0048	1.0269	1.0270	0.9237	1.0000	1.0831	1.1271	1.1072	1.2129
1951	1.3808	1.4221	1.4433	1.4797	1.5858	1.6768	1.7329	1.7731	1.7842	1.8300
1961	1.8861	1.9433	2.0224	2.1112	2.1846	2.2774	2.3285	2.4172	2.5237	2.6430
1971	2.6607	2.7240	2.8521	2.8580	2.8489	3.0436	3.1375	3.1682	3.3095	3.2729
1981	3.2445	3.3264	3.3459	3.4600	3.5485	3.6492	3.7275	3.8370	3.9006	3.9171
1991	4.0625	3.9732	3.9647	4.0037	4.0496	4.1030	4.1428	4.1272	4.1020	4.1824
2001	4.2750	4.3076	4.5062	4.6911	4.8263	4.9572	5.0499	5.1525	5.1322	5.3341

Anthropogenic-only concentrations in ppmv

1751	278.0	278.0	278.0	278.0	278.0	278.0	278.1	278.1	278.1	278.1
1761	278.1	278.1	278.2	278.2	278.2	278.2	278.3	278.3	278.3	278.3
1771	278.4	278.4	278.4	278.4	278.5	278.5	278.5	278.6	278.6	278.6
1781	278.6	278.7	278.7	278.7	278.8	278.8	278.8	278.9	278.9	278.9
1791	279.0	279.0	279.0	279.0	279.1	279.1	279.1	279.2	279.2	279.2
1801	279.3	279.3	279.3	279.4	279.4	279.5	279.5	279.5	279.6	279.6
1811	279.6	279.7	279.7	279.7	279.8	279.8	279.8	279.9	279.9	279.9
1821	280.0	280.0	280.1	280.1	280.1	280.2	280.2	280.2	280.3	280.3
1831	280.3	280.4	280.4	280.5	280.5	280.5	280.6	280.6	280.7	280.7
1841	280.7	280.8	280.8	280.9	280.9	281.0	281.0	281.0	281.1	281.1
1851	281.2	281.2	281.3	281.3	281.4	281.4	281.5	281.5	281.6	281.7
1861	281.7	281.8	281.8	281.8	281.9	281.9	281.9	282.0	282.0	282.0
1871	282.1	282.2	282.3	282.3	282.4	282.5	282.6	282.7	282.8	282.9
1881	283.0	283.1	283.1	283.2	283.3	283.4	283.5	283.5	283.6	283.7
1891	283.8	283.9	284.0	284.0	284.1	284.2	284.2	284.3	284.4	284.7
1901	284.8	285.0	285.2	285.3	285.5	285.7	285.9	286.1	286.3	286.6
1911	286.7	286.9	287.1	287.2	287.3	287.4	287.5	287.6	287.7	287.8
1921	287.8	287.9	288.0	288.2	288.3	288.4	288.5	288.7	288.9	289.0
1931	289.1	289.1	289.2	289.3	289.4	289.5	289.6	289.7	289.8	290.0
1941	290.1	290.3	290.5	290.6	290.7	290.8	291.0	291.3	291.4	291.7
1951	292.1	292.6	293.0	293.4	293.9	294.5	295.0	295.6	296.1	296.7
1961	297.2	297.8	298.4	299.1	299.8	300.5	301.2	302.0	302.8	303.7
1971	304.5	305.3	306.2	307.1	307.8	308.7	309.7	310.6	311.6	312.4
1981	313.2	314.1	314.8	315.7	316.6	317.5	318.4	319.3	320.3	321.2
1991	322.2	323.0	323.8	324.6	325.4	326.1	326.9	327.6	328.2	328.8
2001	329.5	330.2	331.1	332.0	333.0	334.1	335.2	336.3	337.3	338.5

Table 3. Combined emissions, 1750-2010, expressed in  $\mu\text{atm}$ , and, based on these and on Table 1, annual CO<sub>2</sub> concentrations assuming that the only increments since 1751 were anthropogenic.

The two datasets are summed at Table 3, with the annual CO<sub>2</sub> concentrations over the period of study under the assumption that the only increments over that period arose from anthropogenic emissions. The anthropogenic-only concentration in 2010 would have been 338.5  $\mu\text{atm}$ , an increase of 60.5  $\mu\text{atm}$  compared with the 278  $\mu\text{atm}$  thought to have obtained in 1750. However, measured CO<sub>2</sub> concentration in 2010 was about 394  $\mu\text{atm}$ , indicating that 45.5  $\mu\text{atm}$  arose naturally (though a little of this may have occurred by way of the CO<sub>2</sub> feedback).

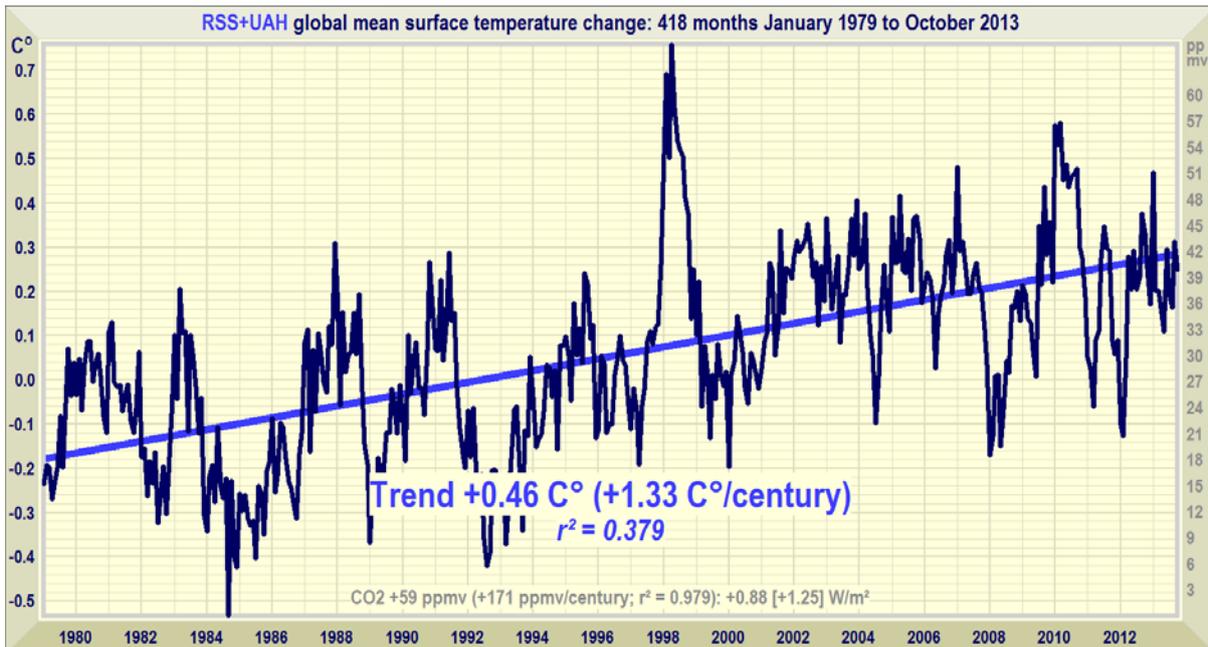


Figure 3. Global warming for three decades at a rate equivalent to 0.13 K decade<sup>-1</sup>.

So much for the aetiology. Now for the quantity. The two authors say the increase in global temperatures over the past three decades was equivalent to “0.2 C decade”. Again, one quarrels with their units. One imagines they mean “0.2 C° decade<sup>-1</sup>”, or, in SI units, “0.2 K decade<sup>-1</sup>”. But, more importantly, one quarrels with their quantity. Taking the mean of the two satellite global surface temperature datasets since January 1979, warming has occurred at a rate equivalent to just 0.13 K decade<sup>-1</sup>, as fig. 3 shows.

Next, we are told sea-surface temperature has risen by 0.88 K over the past century. I doubt it. We are incapable of making reliable measurements of changes in ocean temperature. The ocean is too big, the 3500 Argo bathythermograph buoys too few, and their record too short. This species of hubristic presumption is lamentably commonplace in the politicized climatology of today. To indicate the scale of the problem quantitatively, the Argo system, in place for less than a decade, takes so few measurements that each is the equivalent of taking a single temperature and salinity profile to represent the whole of Lake Superior less than once a year. How meaningful are such sparse and infrequent measurements over so short a period likely to be?

The two authors at last get to the point. They say, “The rapid uptake of heat energy and CO<sub>2</sub> by the ocean results in a series of concomitant changes in seawater carbonate chemistry, including reductions in pH and carbonate saturation state, as well as increases in dissolved CO<sub>2</sub> and bicarbonate ions: a phenomenon defined as ocean acidification. Time-series and survey measurements over the past 20 years have shown that surface ocean pH has declined by 0.1 pH unit relative to pre-industrial levels, equating to a 26% increase in ocean acidity. Reductions of 0.4-0.5 pH units are projected to occur by the end of the twenty-first century and, while atmospheric [CO<sub>2</sub>] has consistently fluctuated by 100-200 ppm over the past 800,000 years, the recent and anticipated rates of change are unprecedented.”

Frankly, this is politicized (and, no doubt, profitable) hysteria, not science. Just look at the language. “The rapid uptake of heat energy”, when on any view we have no means of measuring whether that has been the case, and the Argo measurements show such a slow increase in ocean heat uptake that the models appear to have exaggerated it up to seven times over. “Ocean acidification”, when even on the authors’ own estimates the oceans will still be alkaline a century hence. “Surface ocean pH has declined by 0.1 pH unit relative to pre-industrial levels.” Oh, come *off* it: do these two really expect us to believe they have – or anyone has – the faintest idea what ocean pH was in 1750? Or even, for that matter, what it is now? The error-bars are barn doors: the interval usually cited is [7.8, 8.2] pH units. In my earlier note I had already told you that the assertion that ocean pH has “declined by 0.1 pH units” falls within the error bars, so that we cannot know whether it has occurred at all. This is elementary science. Instead of replying to the point, you merely produce a paper that repeats it. Then the authors make the usual dumb, baseless, exaggerated prediction: “Reductions of 0.4-0.5 pH units are projected to occur by the end of the

twenty-first century.” On what *evidence*? How on Earth could the calcite corals ever have evolved at a time when we know the partial pressure of CO<sub>2</sub> over the oceans was 25 times today’s, if our altering the atmospheric composition by one part in 3000 over the coming century is at all likely to shift ocean pH by as much as 0.4-0.5 units? Can you not see how disproportionate such ill-founded assertions look? Finally, “recent and anticipated rates of change are unprecedented”. Unlikely. Go and talk to any geologist. Ask him what happened as recently as 70,000 years ago in Sumatra, and ask him what effect that was likely to have had on ocean pH.

Frankly, this paper fails even to mention, let alone to address, nearly all of the specific points I made to you in my earlier email. Let me recapitulate just one of them. The oceans are buffered by the rock basins in which they lie. That buffering is powerful. It is homeostatic. It is one of the numerous processes in nature that tend to maintain an equilibrium – in this case, an equilibrium in ocean pH. Why is it that so many in climate and related sciences exhibit no quantitative sense, and in particular no sense of relative magnitudes? The oceans are many thousands of times denser than the atmosphere. They contain 50 times as much CO<sub>2</sub> as the atmosphere. Even if all of the CO<sub>2</sub> in the atmosphere were somehow to pass into the oceans, pH would scarcely change. There is just not enough CO<sub>2</sub> left in the air to overcome the buffering effect of the rocks.

The next paper, Pespeni *et al.*, studies evolution of simple ocean life-forms in the presence of artificial ocean “acidification” and finds that they are able to evolve to cope with it. I quote the abstract: “Our results demonstrate the capacity for rapid evolution in the face of ocean acidification and show that standing genetic variation could be a reservoir of resilience to climate change in this coastal upwelling ecosystem.” True, the authors go on to make the obvious point that small populations will adapt less well than large ones: but this paper is scarcely a terrifying warning of drastic changes in the oceans. Besides, it is not clear to me that their simulation of a CO<sub>2</sub> partial pressure of 900  $\mu$ atm was realistically done, still less that the experiment persisted long enough to study evolutionary adaptation to any meaningful degree.

Well, really, I am disinclined to read the remaining papers you attached. It is clear from the first paper that an avowedly unscientific and politicized stance is being taken; and from the second that organisms in the oceans will continue to be able to adapt and survive much as they always have.

I have here dealt with much of what you have said about ocean “acidification” – and the use of that term throughout the climate industry indicates how politicized and divorced from reality that industry has become. However, you make a final point about the Revelle factor that deserves an answer. Analysis by Professor Pettersson indicates, contrary to what you are here suggesting, that in the past couple of decades the natural sinks have been absorbing a larger fraction of the anthropogenic CO<sub>2</sub> emissions than previously. I suspect that the reason is the failure of the world to warm at all over the past 17 years (fig. 4). If I am right, then the capacity of the

oceans to take up CO<sub>2</sub> from the atmosphere is regulated chiefly by their temperature rather than by their chemistry.

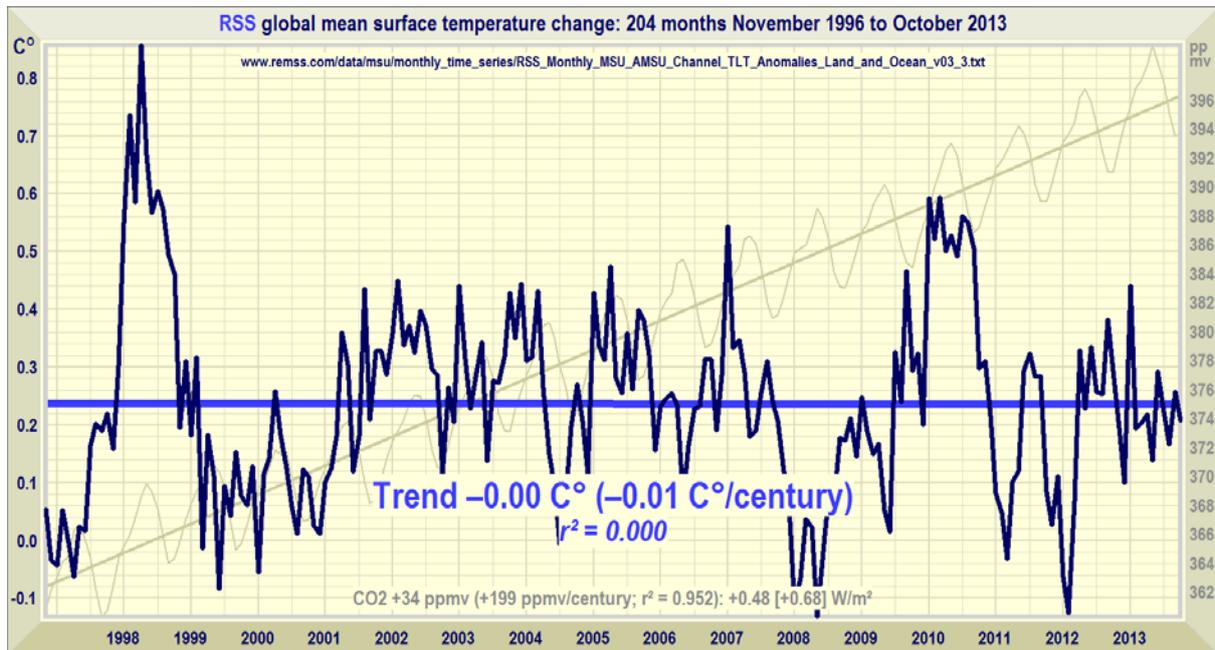


Figure 4. RSS global mean surface temperature anomalies and trend, November 1996 to October 2013.

So to mitigation economics. I note that you are still not able to produce a single economic argument against my conclusion that it is 1-2 orders of magnitude costlier to mitigate global warming today than to let it happen at the predicted rate and cost and adapt to it the day after tomorrow.

I have already warned you about the unwisdom of resorting to mere *ad-hominem* attacks at those points where you are unable to produce a decent scientific argument. It is regrettable that, after that warning, you should continue to think that you will enhance your scientific reputation by attempting, in the absence of the facts, to damage mine.

I remind you again that to introduce irrelevances by attacking the man rather than his argument is to perpetrate the fundamental fallacy of *argumentum ad ignorationem elenchi*, the inability to understand the correct method of arriving at the truth by disputation. This relatively new and disreputable habit of the hard Left arose from the massive campaign of *maskirovka* and *desinformatsiya* sponsored by the intelligence agencies of the late unlamented Soviet dictatorship. The technique is recommended, for instance, by the Communist agitator Saul Alinsky in his *Rules for Radicals*. But in science it is improper. It has no place. You have succeeded merely in annoying those to whom you have copied various items of nonsense lifted from Communist websites, and in demonstrating that you are not capable of engaging in scientific debate in an adult fashion.

So let me deal with your sneering at the World Federation of Scientists. It was founded in Erice, Sicily, half a century ago, by Italy's most eminent scientist, Professor Antonino Zichichi, the first scientist in the world to isolate anti-matter (he did it a long time before the Large Hadron Collider got around to it), together with many other eminent physicists from around the world: Kapitza, Garwin, Dirac, Blackett, Wigner, etc., etc. Frankly, *dottore*, you are not and will never be in their league.

Their honorable purpose was to try to focus science and scientists on doing good. They were horrified at the use of nuclear power for mass murder of civilians. They wanted to restore morality to science, and to keep it rigorous in the face of growing attempts to politicize it – eugenics, Lysenkoism, and now the flashy, trashy global warming cargo cult.

And you “did a search” for the *Proceedings* in which my paper was published. Wow! Research! But I'm prepared to bet quite a large sum that your “search” was the kind of research a zitty teenager would do. You went on the internet, could not find what you were looking for, and decided to sneer. That is the other fundamental logical fallacy, that of the *argumentum ad ignorantiam*, of arguing from ignorance. You could not find what you were looking for, so you assumed it did not exist. Well, it does. Get over it. And learn logic. Without it, you will never understand science.

Next, you provide a link to a hate-speech website, one of thousands expensively maintained by various lavishly-funded promoters of the global warming scam, and devoted to attempting to trash the reputations of any who dare to ask questions rather than merely believing and parroting the Party Line. Not exactly a peer-reviewed source.

That website has a hefty rant at my expense, suggesting that the climate economics paper was not reviewed. Well, it was. Get over it. At the World Federation, as you may imagine, the process is a good deal more rigorous than usual. First, the paper must be read by a wide selection of scientists in relevant fields – in the present instance, specialists in climate sensitivity and in mitigation economics. Indeed, even before that stage I had presented the argument at the Los Alamos Fifth International Climate Conference as an invited paper; I had lectured on it at the Charles University Business School in Prague; I had given a faculty-level talk on it at Louisiana State University; I had discussed it with faculty at the Judge Business School, Cambridge; and at some 30 academic venues worldwide.

Only after all of that, and only after the reviewers have considered the paper and the chairman of the relevant monitoring panel has granted consent, can a paper be presented to the Federation at its annual meeting – especially a paper by the only layman invited to address that meeting. There, some 200 of the world's most

eminent scientists, in the presence of heads of state and government, will hear the paper introduced and will tear into every aspect of it, particularly when it comes to a conclusion that some will find politically uncongenial.

My own paper was presented as the *piece de resistance* at a special session on mitigation economics that I had co-chaired, at which President Klaus of the Czech Republic gave the Magistral Lecture at my invitation, Chancellor Lord Lawson of the United Kingdom also gave a talk, again at my invitation, and several mitigation economists from many nations presented papers.

My own paper was subjected to unusually thorough questioning, for its result was unwelcome to some. I was required to go back and redo it at a zero discount rate so as to remove any argument about whether a commercial discount rate was consistent with inter-generational equity. In fact, President Klaus had addressed that point in his own talk, saying that it was only a commercial rate that was fair to subsequent generations, who would otherwise be left with less of an inheritance for no good reason. Nevertheless, I complied.

Next the Federation's vice-president, Professor Richard Garwin, asked for the central calculation on the Australian CO<sub>2</sub> tax to be summarized in a single page, with every equation made explicit and every source mentioned. He then sat down and went through the calculation with me line by line and could find no fault. He was not pleased, because he is very much on your side of the debate, but he is an honorable man and fair. He was good enough to accept that I had made my case.

That was the final hurdle. The paper, after what, as you may think, was an unusually thorough review, was duly published in the substantial volume that is the *Annual Proceedings* of the Federation. As a direct result of that special session on climate economics, Professor Zichichi invited me to establish a permanent panel on mitigation economics. However, as a layman – and a busy one – I had to decline his flattering invitation.

You also seem obsessed with various links suggesting I am not a member of the House of Lords. I fail to see what on earth that has to do with climate change. However, since the question interests you I shall give you a little background.

A couple of years ago I was in Australia, where the National Press Club, for the first time, had agreed to allow a questioner of the New Superstition to address the nation's news media on live television in Canberra for an hour in prime time in the distinguished visitor's slot. They had framed the event as a debate between me and the director of the Australian Institute. But the promoters of the climate scam in Australia had become alarmed that he would not fare well in the debate because, although he knew enough to parrot the Party Line, he knew no climate science.

So, at 6 am one morning a few days before the debate, the telephone in my hotel bedroom rang. “This is Adam Spencer of the ABC. You’re on the air. I’m going to ask you about climate change before your debate at the Press Club.” I blearily agreed. His first question was, “Are you a member of the House of Lords?”

I replied, “Yes, but without the right to sit or vote.”

He hastily changed the subject and asked why I had said sea ice in Greenland was accumulating when, since 2005, 273 billion tons of ice had gone from the Greenland ice sheet into the oceans. I said that Johannessen *et al.* (2005) had reported that in their study area, and inferentially across the whole of Greenland except the coastal margins, during the 12 years 1992-2003 ice had accumulated at a rate equivalent to  $0.05 \text{ m yr}^{-1}$ , or about 2 feet over the period.

However, subsequently about a quarter of that ice had gone back into the oceans. I said to Spencer, “Would you like to know how much global sea level would rise if you added 273 billion tons of ice to it? The answer is 0.7 millimeters.” Spencer slammed the phone down, and was made to ring back a few minutes later and apologize.

However, someone contacted the House of Lords and said I had claimed to be a member. The Clerk of the Parliaments, without verifying any of the facts with me, and without the authority of the House (check Hansard), and without the authority either of the Lord Speaker or of the Chairman of the Privileges Committee (to both of whom I subsequently wrote) published a nonsensical letter to me on the House of Lords website.

The Clerk’s letter was carefully timed to come out on the morning before the debate at the Press Club. Sure enough, after I had spoken a sneering journalist said, “I’m not sure whether I should even call you Lord Monckton, because the House of Lords says you’re not a member of it.”

I pulled out my passport, opened it to the page saying “The holder is ...” and asked the chairman of the meeting to read out the rest of the sentence. He read out “The Right Honourable Christopher Walter, Viscount Monckton of Brenchley”. Collapse of deflated journalist.

When I returned to the U.K., I asked a barrister specializing in constitutional and peerage law to tell me whether I was a member of the House, albeit without the right to sit or vote. After three months’ research, covering 1000 years of peerage law, he wrote the 11-page Opinion that is attached. His conclusion was that I am, exactly as I say I am, a member of the House of Lords, albeit without the right to sit or vote. But perhaps you know better.

Frankly, you need to raise your game. You are losing the argument with the skeptics precisely because you will not debate the science, and you will not debate honorably. I suspect that you may actually know something about ocean “acidification”: yet, instead of engaging with me properly on this subject, you merely throw a collection of papers at me, the first of which, as I have shown, is nakedly partisan and serially inaccurate. On climate economics you have been unable to reply at all, except to sneer at the World Federation in a manner that you will now realize was remarkably ignorant and foolish. And on climate sensitivity, you have had not a word to say either.

I’ve said it before and I’ll say it again. Science is not, repeat not, a belief system. It is not, repeat not, part of the Communist manifesto. It is a rigorous, quantitative process by which the truth is honestly sought and gradually obtained, not by careless adoption and mindless recitation of a fatuous Party Line but by the advancing and questioning and refining of hypotheses. It is a process as moral as your *ad hominem* attacks are immoral.

Since you will not, will not, will not discuss science honorably, courteously, and fairly, you should be ashamed. The scientist is – as the founder of the scientific method put it – a “seeker after truth”. The road to the truth is long and hard, said Alhazen, but that is the road we must follow.