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Comment on os-2021-49

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Community comment on "Mean sea level and tidal change in Ireland since 1842: a case study of Cork" by David T. Pugh et al., Ocean Sci. Discuss.,
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Mean Sea Level and Tidal Change in Ireland since 1842: A case study of Cork

David T. Pugh et al. status: open (until 12 Aug 2021)

Review of 'Mean Sea Level and Tidal Change in Ireland since 1842: A case study of Cork'

This paper aims to show century-long changes in mean sea level from tidal records inform to climate change adaptation. It is a fatally flawed attempt to combine disciplines based on solar harmonics and statistical analysis.

Precisely accurate astronomical processes should never be judged on statistics.

I suggest it be split into two papers each with two authors.

When I was Professor of Geophysics and Marine Science to get away from publish-or-perish evaluations we gave 1 point to a single author publication, half each to two authors and zero to all others.

This way we detected real innovative contributions and those that made them. Many much-lauded multi publication authors were quickly revealed for their true worth. This is especially important now that IPCC and UN committees are driven by powerful fossil interests intent on gaming consensus evaluations in their own interests with complete disregard to the factual common sense of ordinary scientists and laymen.

There are therefore two conflicting theories competing in this paper.

I suggest it be broken into two with only one or two authors; one on tidal harmonic analysis and the other on Irish Climate model verification from in situ data on time series of surface and near surface temperature salinity, pH and other bio parameters along with standard meteorological observations.

1 Solar 11-year harmonic cycles and climate change

Sea level rise, greenhouse gas concentrations, polar ice melt, global tides and many

climate patterns are linked to solar cycles (IPPC report Economist 2021). Media hailed it as the last red alert for humanity. Accurate long-term sea level records tied to fixed datums using century long tidal records is vital to establishing accurate trends in sea level rise over different 11-year solar periods. Harmonic analysis not statistics is the obvious approach

Sunspot cycles are known with great accuracy and stability over millions of years. The 11-year sunspot cycle was shown over 79 years from tree rings in a German Permian fossil forest from 290m years ago (Luthardt and Rössler 2017). Indeed, the Antikythera Mechanism found in 200 BC but probably centuries or millennia older, is an astronomical clock to forecast solar and planetary times. It could forecast the colour of lunar eclipses 78 years ahead! (<https://www.youtube.com/watch?v=cSh551cdIEY>). This suggests ancient solar knowledge of orbits well before the last ice age. The many dials included ones for the 4-year Olympic and Corinthian Games. It must have been developed over many years for long ocean voyages long before the Harrison Clock to determine longitude.

Babylonians and residents of ancient Sippar wrote cuneiform tablets explaining conic sections, spherical geometry of 360 degrees. They used the 2x3x4x5 duodecimal system which USA and UK used in the Pounds Shillings and Pence currency and feet and inches measurements. The pound was a weight and currency. A standard set of measures in the British Museum are a set of smooth egg shaped weights ground smooth from metallic meteorites. The craftsmanship on this Bureau of Standard set would challenge modern metal smiths and are clear evidence of a highly skilled metalworking and engineering.

I discussed this with Irving Finkel, British Museum Cuneiform archaeologist and historian. We support the idea that a very advanced civilization must have existed long before the biblical flood. Graham Hancock has meticulously researched this concept in his books (Hancock, 1995, 2019)

Climate and Sea level from Pre-industrial pre Ice ages

The 1513 Ptolemaeus Argentinae map shows Antarctica attached to South America and a large Island off Western Ireland called Brazil. This is highly significant for Ireland since it was above water for 130,000 years before the 12,800 year old flood ended the last ice age. This is of significance to the Irish authors with a substantial island just off shore for at least 130,000 years.

This puts into perspective the significance the 244m (800ft) Ptolemy Tower (55.02°N, 7.43 W) Grianan of Aileach hill fort. It is shown on the 140AD map of Greek Astronomer and geographer Ptolemy of Alexandria. It may date as far back of 1700BC.

To an oceanographer it is highly significant since it gives commanding views down Lough Swilly and Lough Foyle. The walls of the restored fort 4.5m (15ft thick) and 5m (16ft thick). It has three terraces linked by steps and two long passages within. It would be ideal for spotting invaders or traders from the North.

The last ice age melting was from the north. Alaska never had an ice age when Ireland and Isle of Man had at least a km of ice. It is clear that civilisation re-established from the North including Shetland, Hebrides, Ireland, Isle of Man. It is entirely appropriate that Irish researchers should investigate just how important the paleo climate and people were in re-establishing civilisation after the Ice Age.

Sea levels averaged 50m below present. Carbon dioxide varied between 180 and 280 ppm. 25,000 years ago large continents, Beringia, Australasia, Sundaland, were highly productive trapped CO2 in tropical forests and boreal plains and shallow seas. This reduced CO2 to 180ppm. Somehow our ancestors survived very rapid sea level rise from

-114m 25.6kyBC to +14.5m in 3.2kyBC. It is therefore important to establish secure datums to correct for rebound after the land ice melted. The authors are on the right track in doing this.

Chris Rapley in his 2017 lecture to Irish IPA reported that communicating climate impact of exponential induced greenhouse gas global warming processes is hard to get across to people who do not want to believe (Rapley 2017). He noted that troposphere/stratosphere greenhouse gas layer become opaque in thermal infrared in 2010.

Chris, now retired, was struggling to get across the dangers of sea level rise to the Thames Barrier while he was Chair of the supervisory committee. The Thames Barrier is operated by the world's first operational tide and storm surge computer program developed by Norman Heaps and his team at the now defunct Proudman University of Liverpool Bidston Tidal Institute. It is a remarkable model that coordinates protection of the Thames, Netherlands Deltaworks and Rhine, and German Elbe and Hamburg. It was here that Tidal Harmonic Analysis was developed by Arthur Doodson. The Permanent Service for Mean Sea Level included global earth and ocean tidal analysis was developed by Geoff Lennon. PSMSL moved to Flinders University with Geoff where he trained students who developed global tidal range maps at the Australian Meteorological Bureau (Matthews and Matthews 2014). The return of PSML to remnants of Proudman coastal modeling Laboratory would suggest this is the ideal place to do comprehensive harmonic analysis trends over several multiples and fractions of solar 11 year periods.

The PSMSL IPCC data in the last analysis only goes to 2013. It shows 1.7 ± 0.2 mm/yr 110 years, 3.2 ± 0.4 mm/year in 17 years (www.climatechange2013.org).

Given the proven doubling in halving time intervals shown in greenhouse gas insulating blankets and relatively steady solar insolation we would expect similar results from tide gauge records. 1.7 ± 0.2 mm/yr 110 years, 3.4 ± 0.2 mm/yr 55 years, 6.8 ± 0.2 mm/yr 22 years, 13.6 ± 0.4 mm/yr 11 years, and 27.2 ± 0.4 mm/yr 6 years.

This latter 2.7cm or about 1 inch per year is consistent with the meltwater observations at the Galapagos that show a fall of -1.1°C per year from 2015-2020.

I know what is involved in harmonic analysis from experience. For fifty years 1967-2017, we produced a tidal calendar used to determine fish and ecosystem response to tidal cycles (Matthews, J. B., S. R. Browning, and D. A. Thompson, 1967). The analysis should be an easy and very valuable contribution

Please could a pair from PSMSL see if this is in fact the case. We regularly see seals on garden walls and kayaks in the high street during Spring Tides on Isle of Man. Rising tides float all boats. David Pugh's splendid book (online Soton) on Tides and Storm Surges played a major part in determining wind drift at 3% of wind speed and 3-4 degrees to the right in the Ebbesmeyer-Ingraham fully verified model of 11 surface gyres. They clearly have the necessary skills. The final figure in the present paper hints at a steep rise towards the end of the record. The suggested analysis will determine the truth.

What are the accurately datum- and atmospheric-corrected values for UK ports especially over the last 6 years?

Sensitivity Theory and Evaporation

Meteorological climate models ignore ocean surface dynamics and still use the completely discredited Lindzen Sensitivity Theory. Climate Sensitivity claims the CO2 Greenhouse Gas doubling CO2 blankets produces negligible global warming. Climate models still use sensitivity theory to forecast potential global warming (Matthews 2017).

Sensitivity is now widely condemned but still does not recognise Earth can only lose heat as a black body radiator with an effective constant temperature of -21°C (Matthews 2017). Greenhouse gas blankets reached 395 parts per thousand when they became opaque as Chris Rapley reported. The astonishingly rapid destruction of a rich kelp forest to an unproductive lawn in NW Australia is a sign of just how rapid this change can be off our own kelp forests (Matthews 2017). These are already much changed since I dived on them in the 1950s. The cooking of mussels during spring tides near San Francisco appear to have gone un-noticed. Warm subsurface salty water from the south stressed the mussels then those exposed at low tide were cooked in strong sunlight. If this were in Lough Foyle or in Menai Strait it would be a major disaster. Californians prefer pizzas and hamburgers to mussels. Our kelp forests, mussel and oyster beds are under serious threat from rising ocean surface temperatures. This needs urgent confirmation.

Since the Paris Accord despite agreement to reduce fossil emissions they have gone up every year. As we stated when you have too many blankets and overheat in bed it is not sufficient to stop adding blankets. You have to take them off (Matthews 2017). That means reversal of all fossil emissions immediately. This will not happen. So mitigation and preparation is the only way.

Ironically Richard Lindzen in May 2017, retired MIT Meteorology Prof and renowned climate denier gave a lecture to the Irish Science Forum in Dublin in a private meeting (<https://www.desmog.uk/2017/05/05/new-climate-science-denial-group-launches-ireland>). It was the same year as Rapley's dire warning. Richard has now retired but always threatens anyone who denied his assertions with libel lawsuits. Scientists always wonder if they are right and generally back off under such threats.

Carbon dioxide, he told the audience, is a plant fertilizer, and the Earth was lush 600 million years ago when atmospheric CO_2 levels were far higher than today. He described any climate change that has occurred to date as "miniscule", calling it all for the good.

The Climate pair, I suggest would conduct a simple test of actual evaporation from a standard meteorological evaporation pan. I cannot find any experimental work that shows it does not depend on relative humidity and wind speed but simply on Stephan's law - proportional to the fourth power of the absolute temperature.

This is what we found in the Central Pacific after repeated testing and correlation runs. If it were dependent on windspeed and relative humidity, evaporation would be higher at midnight off Labrador in strong winds than at the Equator under calm conditions! We need simple experimental data from Met Office Evaporation Pans to determine Stephan's Law evaporation from well-designed experiment. My PhD supervisor Sir John Mason was Director of the Met Office. He would have been appalled that the Met Office has been sold to a Swiss commercial company. Moreover commercial publishers have taken our papers and demand fees to read his and my papers that we paid to publish for free for perpetuity. So much for intellectual property rights. I use ResearchGate for free discussions but even this is now taken over by Google..

This evaporation experiment would be of enormous help in killing the totally wrong concept of the Ocean Conveyor and Gulf Stream cutoff that modellers so hope is true.

We attempted to present our startling experimental results in Ocean Sciences and Ocean Science Discussions earlier. But the editors were unreceptive to experimental results that conflicted with standard unverified models. (Matthews and Matthews, 2012, 2013). A reviewer later wrote privately to apologise but the damage was done to an early day scientist. He has recovered and is playing an important role with IPCC.

We hope the current Editors can deal with experimental verification of model theories in

our highly endangered ecosystem collapse.

We hope too the authors will take this constructive criticism as a boost to their careers and a real contribution to understanding and mitigating the existential threat to humanity.

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