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Models are Valid or Invalid, and Then Useful Only If Valid Also in Climate Science

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Abstract

We discuss here the latest paper by Le Cozannet et al. (2015), the findings by Morner (2015) that reconcile all the observations about sea levels, and more in general the validity of the present climate models. Every model without validation should not be used to forecast future scenarios. It is shown as unfortunately, in the science of climate, the fundamental validation step where the models outputs are tested vs. true experiments is always omitted. Even worse, the experimental evidence is often manipulated for compliance with those climate models that never before were validated. It is concluded as it is very likely that the future sea-levels will be very far from the climate models prediction. Numerical analyses performed assuming realistic the results of invalid models similarly lack of any usefulness.

Keywords

Sea Levels, Temperatures, Sea Ice, Global Warming

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1. Real Sea Level Rise - Methods and Results

In the science of climate change, the evidence is made of climate model predictions rather than the analysis of the actual measurements performed so far. I have shown in many papers that what is computed by the climate models fails to reproduced the experimental evidence for temperatures, sea levels, rainfall, sea ices and what else makes the climate (Parker, 2013a-i; Parker, Saad Salem & Lawson, 2013; Parker & Watson, 2013; Parker, 2014a-f; Parker, 2015; Parker & Ollier, 2015). Regarding sea levels, the world tide gauges (see the various surveys by the Permanent Service on Mean Sea Level, for example PSMSL (2015) and previous similar analyses) indicate about same rate of rise (or fall) of relative sea levels in all the monitored locations over this century. Therefore, there is no sign at the tide gauges of any global warming induced sea level acceleration produced by thermal expansion and ice melting. The sea levels are very slow rising (+0.24 mm/year in the naïve average of the 170 tide gauges exceeding 60 years of record) and stable.

Figures 1 and 2 present the relative sea level rises computed with the PSMSL facility (PSMSL, 2015) for North America and Europe, the only two areas of the world covered by a statistically significant number of tide gauges. Please note that PSMSL changed the method of calculating relative sea level trends in 2015. The trends displayed are therefore not directly comparable with any calculated before that date. However, to understand the presence (or absence) of any acceleration we may consider tall the stations with data 1934 to 1993 (stations of minimum length to infer a trend of 60 years at the start of the satellite altimeter monitoring) and then 1934 to 2013 (roughly same stations latest update). As the method to compute the trend is the same, the addition of 20 years of data will translate in larger relative sea levels if there is a positive acceleration, or smaller sea levels if there is a negative acceleration. The data selection method remains the same as before. Only data with long term datum control

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are used. Trends are only calculated where a station has at least 70% of annual means present over a given period and the station is not marked with a quality control flag. Data marked with a quality control flag are ignored. For each period fitted, the time series is decomposed into the following components: linear trend, seasonal component made up of an annual and a semi-annual cycle and noise component modelled using three stochastic parameters and an amplitude, and a white noise amplitude.

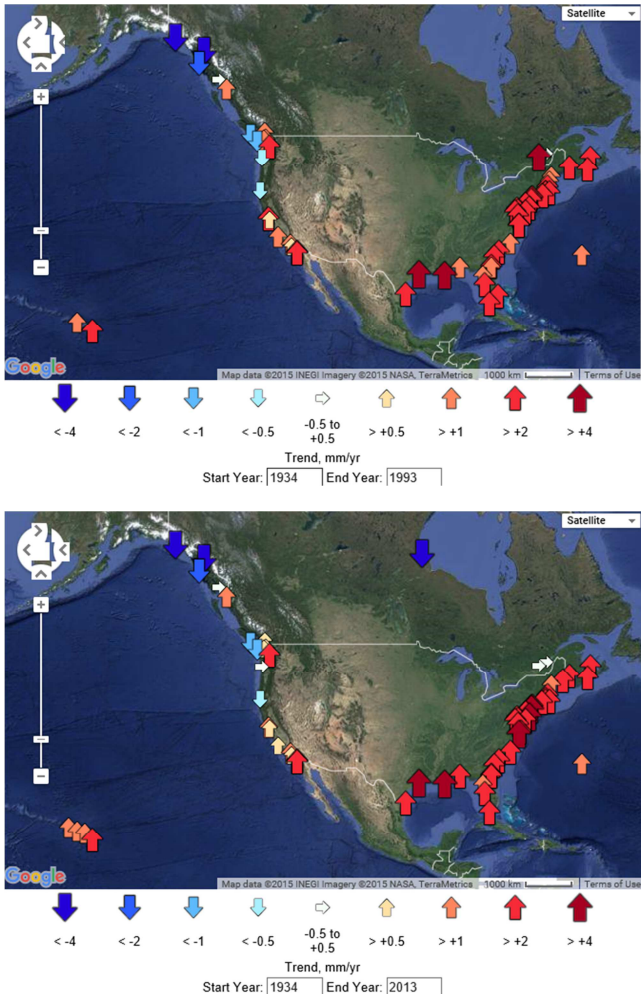

Figure 1. Relative sea levels for North America computed by using the PSMSL online facility by using the time window 1934 to 1993 (left) and 1934 to 2013 (right). The additional 20 years of data haven't changed too much the relative sea level rises mostly driven by the subsidence of the instrument, usually larger than the subsidence of the coastal land.

The weighted least squares parameters are calculated using maximum likelihood estimation. The additional 20 years of data haven't changed too much the relative sea level rises in these two locations that are those better monitored worldwide. The relative sea level rises are mostly driven by the subsidence of the instrument, usually larger than the subsidence of the coastal land that may be subjected to extra subsidence because of various anthropogenic phenomena as mining, water extraction and heavy coastal construction.

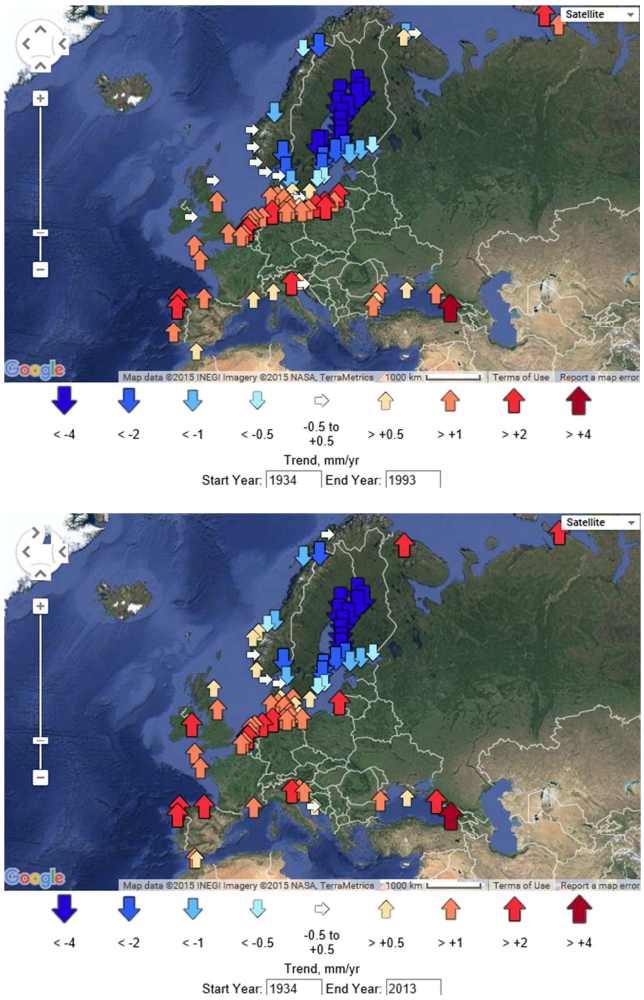

Figure 2. Relative sea levels for Europe computed by using the PSMSL online facility by using the time window 1934 to 1993 (left) and 1934 to 2013 (right). The additional 20 years of data haven't changed too much the relative sea level rises mostly driven by the subsidence of the instrument, usually larger than the subsidence of the coastal land.

2. Virtual Sea Level Rise - Methods and Results

Over the last few decades, interest of sea level analyses has been shifted from the local tide gauges, recording in selected coastal locations the relative sea levels in some cases with records spanning even 200 years, to the satellite monitoring. Since 1993, the satellite altimeter measurements have delivered a new picture of the global absolute sea levels covering the water surface all over the globe. In addition to the altimeter, also gravity measurements have provided in the first decade of this century a similarly accurate picture of the absolute state of the global oceans. In both cases, before accounting for the Glacial Isostatic Adjustment (GIA) that is modelled by mostly upward motion of the land, the satellite raw signals evidenced oscillations about a nearly flat trend. Such a flat trend is perfectly compatible with the naïve averaging of the relative rate of rise at the tide gauges.

The raw satellite altimeter result is indeed a noisy signal almost de-trended that only the arbitrary correction by spreading worldwide the GIA makes the about +3 mm/year sloped curve of CU (2015) and others (Morner, 2015; Parker, 2014d). The naïve average of the tide gauges of the latest PSMSL survey (PSMSL, 2015) is presently returning a rate of rise of only +0.25 mm/years when only the tide gauges of enough length exceeding the 60 years are considered, exactly same value of previous surveys based on the same tide gauges.

Mörner (2015) shows that the GIA is a local and not a global phenomenon, and therefore the corrections to the satellite results are arbitrary. The load of the continental ice caps of the Ice Ages deformed the bedrock. When the ice melted in postglacial time, then the land rose. The deformations are compensated in principle either regionally or globally, but the Fennoscandian geological data indicate the compensation is more likely regional. The relative sea level data also support a regional, not global, compensation. Therefore, the corrections of one GIA model should be subtracted back from the satellite altimetry records.

3. Comparison of the Two Worlds

Moreover, as the parameter of interest is the relative sea level rise vs. the land that is what is ultimately measured by the tide gauges and what may drive inundations, where is the need to look for absolute sea level rises by introducing an arbitrary there correction if not making unclear what is otherwise evident? After the first 15 years of this century, at the world tide gauges having more than 60 years of recording, the sea levels have risen or fall, on average, of 3.75 mm. As there are still 996.25 mm left and only 85 years left for the 1 metre by 1 century, also considering the lack of any acceleration of sea level rise at the tide gauge, the prediction of the climate models is very likely wrong.

If the modelled GIA is removed from the latest published Global Mean Sea Level (GMSL) trends suffering of this subjective correction, for example Colorado University (CU, 2015), the actual trend experienced since 1993 is a modest rise of +0 to +1 mm/year rather than the claimed +3.2 mm/year, Figure 3. All the different sea level indications, satellite, tide gauges and global key sites, are perfectly into harmony of a present GMSL slow rising not accelerating as soon as the arbitrary global correction by one GIA model is removed. Figure 3 also presents the naïve average of the worldwide tide gauges of length exceeding the 60 years at the time the satellite monitoring started, about 100, or of all the tide gauges, about 570. The average sea level rises are +0.24 mm/year, or +1 mm/year respectively. On average, the acceleration computed by comparing the previous surveys of relative sea level rises from PSMSL is 0 mm/year^2.

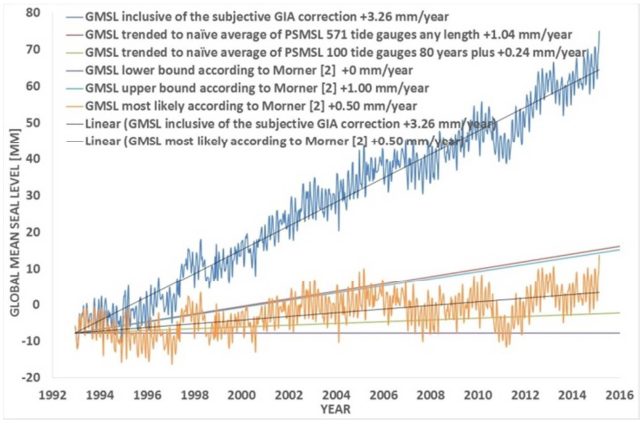

Figure 3. Latest GMSL affected by the arbitrary GIA model correction from CU (2015). Lower and upper bound of the GMSL without the GIA model correction according to Mörner (2015). GMSL trended to the naïve averaging of the 100 tide gauges of PSMSL (2015) having length more than 60 years at the time the satellite altimeter monitoring started, or the naïve averaging of the 571 tide gauges of any length listed in PSMSL (2015).

Mörner (2015) conciliates all the information on sea levels available from multiple sources, and demonstrates the non-sense to focus on arbitrarily corrected "absolute" global values when the "relative" global and local values are actually what should drive the work of the policy maker.

4. Discussion

The reason why the sea levels are not rising faster is simply because the temperatures are not warming significantly, as the global temperature has been almost flat over this century. Similarly, the sea ice loss in the Arctic has been outpaced by the sea ice increment in the Antarctic for a net zero contribution from melting of ices. Therefore, there is also consistency in the measured climate parameters to suggest the climate model predictions of sea level rises driven by the anthropogenic carbon dioxide emission is wrong (Parker, 2013a-i; Parker, Saad Salem & Lawson, 2013; Parker & Watson, 2013; Parker, 2014a-f; Parker, 2015; Parker & Ollier, 2015).

Le Cozannet et al. (2015) may certainly claim in their paper that if sea-level will rise of significant amounts, then the frequency of coastal marine flooding events will change, as these events will certainly occur more often. However, it is not correct to say that the sea levels are rising and therefore we will expect more flooding events, because this is not true.

Le Cozannet et al. (2015) should mention that the IPCC projections of sea levels, similarly to the predictions of temperature, rainfalls or sea ices, are only computations by invalid models. If we look for example at the RSS or UAH lower troposphere temperatures (LTT), the simulations

performed this century do not seem to be useful at all, see Figure 4. Models are not right or wrong, but valid or invalid, and then useful if valid or completely useless otherwise.

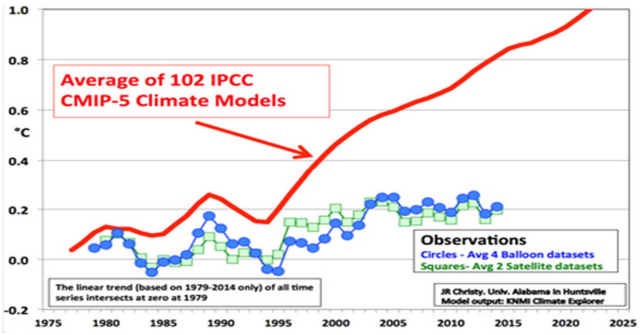

Figure 4. Comparison of measured temperatures (balloon and satellite data sets) and climate model predictions (image from Jonas, 2015).

A model is only valid to the extent that the story they tell us holds. This does not seem the case for the temperatures of Figure 4. Similarly, the sea levels at the worldwide average tide gauge of the PSMSL surveys that are everything but accelerating, Figure 3, do not support the claim sea levels may rise of 1 metre by 2100. The temperatures or the sea levels do not obey to the mathematics formulated by the IPCC by forced consensus.

5. Conclusions

The propositions formulated in scientific models are true to the extent that the models tell us something valid and useful about the reality we are studying. Popper says that science is about the possibility of falsifying hypotheses. It does not take too much effort to falsify the IPCC theories by looking at true measurements if we are permitted to do so. Every analysis built on the result of invalid models is useless.

Models should be validated before they are used for any practical, like coastal protection. Unfortunately this is not done in many places, as for example in NSW, Australia where draconian measures with land zoned for a mythical projected sea level rise based on unvalidated models are enforced, and pensioners are driven off their sea front land. Why do planners seem to prefer models to reality? And especially predictions that relate to a time when they can no longer be held responsible. Are they really blinded by pseudo-science, or is there money in it somewhere?

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