Public Consultation on the Draft Climate Change Adaptation Sectoral Plan for Agriculture, Forest and Seafood Sector

Consultation Questionnaire

1. Details:

Full Name: **Tim Gleeson**. ________________________________

Organisation where applicable

Retired Ex-AFT & Teagasc Research Scientist Soil Physics Dept Kinsealy

or

Member of the public: ☐

Subsector:

- Dairy ☐
- Mixed ☐
- Beef ☐
- Arable ☐
- Sheep ☐
- Horticulture ☐
- Fisheries ☐
- Industry ☐
- Prepared Consumer Foods ☐

Other: __ Research Scientist Soil Physics Dept Teagasc Kinsealy ________________________________

2. What do you think are the changes in climate that are having the most impact on those working in the agriculture, forest and seafood sector?
Extreme Rain  ☐  Storminess  ☐
Drought  ☐  Flooding  ☐
Extreme heat  ☐  Seasonal stability  ☐

Other: None of above. I believe there has been only a modest effect of rising CO₂ levels on climate so far and as I explain below an increasing body of research evidence is supporting that view.
Please Explain:

Present Models have exaggerated climate change prediction. A number of very senior climate physicists and meteorologists in recent years are revising downwards the climate sensitivity to CO₂. A good example is Richard Lindzen a renowned physicist who was part of the first US Presidential Climate Committee under the Chairmanship of Jule Charney Prof of Meteorology at MIT which reported in 1979. Charney was a key figure on the role of CO₂ in global warming. Lindzen was a brilliant young physicist who had, about that time, figured out the relative effects of the moon and the sun on atmospheric tides which had baffled scientists up to that time. Lindzen subsequently wrote a book on that issue. The Charney committee’s report was the cause of international concern on the rising concentration of CO₂ in the atmosphere and that eventually led to the formation of the IPCC. Both Charney and Lindzen would have been enthusiastic supporters of the eventual outcome of these early studies which was that a doubling of CO₂ in the atmosphere would probably lead to a temperature increase of about 3-degrees-C (mid-range value). However Lindzen being the critically observant scientist that he was and still is, noticed over the following decades that the climate sensitivity was not as great as originally calculated. He set about some critical research and in the following years has published some key papers on the issue. I show below a reference to one such paper and its abstract, that he and his colleague Y-S Choi published in 2011.

More recently (2016) Ray Bates a retired research meteorologist with a very high profile has followed up on Lindzen and Choi with a somewhat more accurate estimate of Climate Sensitivity to CO₂. Ray’s estimated value is just about or under 1-degree-C for a doubling of CO₂ in the atmosphere. Ray who obtained his Ph.D from the same Jule Charney at MIT, was head of Research in Met Eireann for a time, followed by a period as head of planetary climate research in NASA at the Goddard Space centre nr Washington and before returning to Ireland to set up a department of meteorology at UCD was Professor of Meteorology at the Niels Bohr Institute University of Copenhagen. I also show reference to Ray’s 2016 paper and its ABSTRACT, below/at the end of this form.

**On the Observational Determination of Climate Sensitivity and Its Implications**

Richard S. Lindzen1 and Yong-Sang Choi2

1Program in Atmospheres, Oceans, and Climate, Massachusetts Institute of Technology, Cambridge, U. S. A.
2Department of Environmental Science and Engineering, Ewha Womans University, Seoul, Korea


**Abstract:**

We estimate climate sensitivity from observations, using the deseasonalized fluctuations in sea surface temperatures (SSTs) and the concurrent fluctuations in the top-of-atmosphere (TOA) outgoing radiation from the ERBE (1985-1999) and CERES (2000-2008) satellite instruments. Distinct periods of warming and cooling in the SSTs were used to evaluate feedbacks. An earlier study (Lindzen and Choi, 2009) was subject to significant criticisms. The present paper is an expansion of the earlier paper where the various criticisms are taken into account. The present analysis accounts for the 72 day precession period for the ERBE satellite in a more appropriate manner than in the earlier paper. We develop a method to distinguish noise in the outgoing radiation as well as radiation changes that are forcing SST changes from those radiation changes that constitute feedbacks to changes in SST. We demonstrate that our new method does moderately well in distinguishing positive from negative feedbacks and in quantifying negative feedbacks. In contrast, we show that simple regression methods used by several existing papers generally exaggerate positive feedbacks and even show positive feedbacks when actual feedbacks are negative. We find the new method gives a better description of the range of feedbacks and their uncertainty than do the previous methods.
3. What do you think the main impacts from climate change will be on the agriculture, forest and seafood sectors? - very mild

Please Explain: - very mild -
This is a logical conclusion of the revised climate-physics of Lindzen, Choi, Bates, and a long litany of other meteorologists and research climate physicists with the necessary knowledge of the fundamental climate-physics to undertake the necessary research to come to realistic estimates of the true impact of the ever rising problem of CO₂.

4. How are those working in the sector currently adapting to climate change?

Please Explain:
Since there has been no noticeable change of climate in Ireland .. There has been no observable change in farming practice that I am aware of ..
5. Where do you get climate related information?

Please Explain: I have been a life-long worker in research in the area of “soil physics” in Teagasc which deals with the physical property of soils and soil water and their effects on plant growth. These effects would include photosynthesis, water supply/water stress, irrigation, drainage; all areas heavily dependent on climate. My late Boss Billy Burke set-up all the original Teagasc Climate Stations. In more recent years I was responsible for some of these stations. I was a member of the Met Eireann Ag-Met Society and also a member of the Irish Met Soc. I met many expert meteorologists, climatologists and solar scientists through these societies. An early contact was C John Butler a solar scientist and chief astronomer at Armagh Observatory. As early as the mid-1990s John was showing that the Irish climate was influenced by Solar Cycles. He and E Pale Bágo published a number of papers on the influence of cosmic rays on terrestrial clouds and global warming for example Palle, E., Butler, C.J., 2000 in Astronomy and Geophysics 41, 18-22. See also:-

http://news.bbc.co.uk/2/hi/sci/tech/1045327.stm
https://www.researchgate.net/publication/222024340_The_possible_connection_between_Ionisation_in_the_AtmOSPHERE_by_Cosmic_Rays_and_Low-level_Clouds

At Cornell University where I spent some time, I had the privilege of knowing Edgar Lemon. Soil Physics and Agr Meteorology were twin departments at Cornell and I shared an office and Labs with Edgar. He was team leader of a project to model photosynthesis and plant growth in a maize crop taking into account solar radiation in all its variability, soil moisture stress in all its variability and evaporation. He measured energy and material exchange in the plant-air layer of the crop, CO2 uptake, moisture loss etc. He compared his comprehensive mathematical model predictions with actual field observations and from him I got a great sense of how difficult it is to model the effects of climate on a crop; even over the relatively short life of a maize crop. A short popular article at the time may explain:-

Link: https://science.sciencemag.org/content/174/4007/371
6. What additional information do those working in the sector need to adapt to a changing climate?

Please Explain:

It is very important that:

1. rigorous balanced research results are obtained for the possible effects that Climate Change may have on the range of crops grown in Ireland and similar information is needed for the range of animal production systems in use in Ireland.

2. that Met Eireann’s archival data is fully understood and used for estimating possible climate change. That the reanalyses methodology of data being carried out by Met Eireann is using all the rigorous and objective up-to-date big-data science and techniques known to climate scientists and meteorologists.

3. Research should include the “Heat Island” effects of urbanisation in the vicinity of Old Climate Synoptic Stations and these effects should be taken into account when revising archived records.

4. Research should also include the ameliorating effect of shading by planting suitable trees or other tall plants in the vicinity of buildings, roads, open-bare-ground and hard surfaces covered by concrete, asphalt, aggregate and other such materials and surfaces. This research should also look at farm-yards, farm buildings, and all hard surfaces on farms whether as farm roads or within farmyards. There can be considerable visual, ecological and bio-diversity benefits from such plantings. These should also be assessed.

References:

Impact of deforestation on subsurface temperature profiles: implications for the borehole paleoclimate record

Andrew H MacDougall1,3 and Hugo Beltrami1,2


Published 10 July 2017 • © 2017 IOP Publishing Ltd
Environmental Research Letters, Volume 12, Number 7

Abstract

Subsurface temperature profiles measured in boreholes are one of the important archives of paleoclimate data for reconstructing the climate of the past 2000 years. Subsurface temperatures are a function of past ground surface temperatures (GST), however GSTs are influenced both by changes in land-use and changes in regional climate. Thus the history of deforestation at borehole sampling locations represents a potential uncertainty in the reconstructed temperature history at the site. Here a fully coupled Earth system model is used to estimate the magnitude of the subsurface temperature anomaly from deforestation events from a global perspective. The model simulations suggest that warming of the ground surface is the dominant response to deforestation, consistent with the limited field data that exist. The magnitude of the temperature anomaly varies by environment with a global average anomaly of 0.85 °C with a range of −0.48 °C to 1.78 °C. The warming originates from a reduction in the efficiency of turbulent energy flux to the atmosphere overcompensating an increase in albedo. Overall our simulations suggest that deforestation has a large impact on subsurface temperatures for centuries following deforestation and thus GST reconstructions should take into account previous deforestation events.
7. How do you perceive and use weather and climate information to inform management decisions?

Please Explain:
People in Agriculture adapt to weather in real time. If they do not know how to do that they usually don’t last very long in farming. I was born and worked on a farm until my early 20s. Adapting to weather was a continuous daily exercise.

8. Is the source of inputs to your farm or business affected by climate change; if so what supply chains?

Please Explain:
Not applicable as I do not have a farm myself. But from observation I think this is more a perceived problem by urban based media people than a real farmer problem. Ray Bates in a recent presentation to Emergency Response Personnel in Dublin pointed out that Met Eireann’s records show that land temperatures in Ireland have risen only 0.25-degrees-C since 1950!!

Reference:

Talbot Hotel, Stillorgan, Co. Dublin Date: Thursday 30th May 2019.

9. When making investments and management decisions how far ahead do you plan?

0 -1 year □
1-5 years □
5 -10 years □
10 years + OK - for a lifetime

Please Explain:
When I was young -I planned for a life-time. At 80½ - I do the same but that’s not as long now.
10. Does the Draft Climate Change Adaptation Sectoral Plan adequately demonstrate the potential impact climate change may have on Agriculture, Forestry and Seafood in Ireland (see section 4 of Draft Plan)?

- Yes but over-estimates the impact
- No
- Need more information

Please Explain: ------ as said above and in previous answers Climate Models are overestimating warming potential and this is distorting the more moderate and sensible adaptation plans that need to be made.

11. The Adaptation Plan’s focus is on actions that can be undertaken over the next five years. Therefore, do you think the Adaptation Objectives are appropriate for the duration of this plan (see section 2 of Draft Plan)?

- Yes & No I am submitting separately some changes more appropriate to Ireland see also reply to Qs 12-14
- No
- Unsure

Please Explain:

No I am submitting separately some changes appropriate to Ireland See summary below under Questions 12 13,& 14.

12. What three things could the Department do to help you be better prepared to adapt to future climate change?

I think at this stage the most important thing for the DoAg to do is to listen carefully to those scientists who have a long history in fundamental Climate Science, Meteorological Science and Solar Science Research and be prepared for a radical rethink on several key issues such as ...

(i) the climate sensitivity to CO2 is about to be reduced to a third

(ii) the global warming potential of CH4 and N2O are about to be proven to be near zero because the narrow bands in which
they absorb IR radiation correspond to much broader bands in water vapour that absorbs all the IR there is from back radiation from the earth. .. some of this has been published and I will follow up with more references.

(iii) Advanced climate science is now showing with significant certainty that Global temperature over medium and long periods are influences by solar cycles the important one in recent years the sunspot cycles which affect earths electromagnetic protection shield which allows or reduces cosmic rays to penetrate which “seed” cloud initiation which affect earth temperature .. more references to follow

(iv) Met Eireann data shows that Irish climate has only had a 0.25-degree-C temperature rise since 1950 and Ray Bates one of Ireland’s and the world’s leading meteorologists has shown this to be due to the Atlantic Multidecadal Oscillation one of the many earth’s natural climate cycles more on this and references to follow.

13. Any other comments? YES

I believe The government is following a very in-appropriate policy on forestry .. No country in the world is talking about planting trees on farm-land like Ireland is, with the possible exception of NZ .. and I don’t believe NZ are ever going to go ahead with that silly plan.

There are opportunities to plant plenty of trees in other areas. For example:-

(1) **Urban areas**: particularly areas where the trees would shade open ground and hard surface areas. Not only would these trees provide the same carbon sequestration as trees planted on farmland, but they would help to prevent direct earth heating and UHI – Urban heat Island effects. They would also of course when correct variety of tree is safely planted be an added visual and civilising influence on raw urban housing and industrial areas. They would further provide valuable ecological and biodiversity environments where none exist at present.

(2) **Hedge-rows**: There are 100sk kilometres of hedgerows in Ireland – from a strictly utilitarian viewpoint they have become a bit redundant since fencing wire was invented. They have some ecological value as they exist but by choosing the correct variety of tree this could be greatly enhanced. Tall trees in a hedge row trap at least twice the solar radiation as the same trees in a plantation because being surrounded by low crops such as grass the direct solar radiation corresponding to the shadow area of the trees is to the benefit of the trees and not to the crop. For this reason, mature hedge-row trees should get at least twice the credit per tree as plantation trees get. It is an easy exercise for scientists to calculate an accurate value for this effect. There are many native fast growing trees such as Poplar and similar species that would enhance the countryside. These trees would probably be more
suited to fuel-crop than saw-log. These hedge-row plantings would present a great opportunity for local fuel-crop schemes to be organised. Larger schemes sponsored by power companies such as Bórd na Móna would provide lucrative business opportunity for tree planting companies to plant hedge-rows on a wide scale for some transition years while the peat bogs that are in production are cut out. These can then be restored properly and orderly over time by creating wet-lands and fish farms and the like. Abandoning part-cut over bogs is a crazy idea.

(3) Shading Rural buildings and hard surfaces: Similar to the use of trees in urban areas to shade buildings and hard surfaces there are many opportunities to do the same in rural areas:-

Farmyards - have many ugly buildings and extensive areas of hard surface and bare ground all of which add to the increase in land temperature experiences in the Northern hemisphere in recent decades. Planting trees to shade and screen farmyards would, as well as have the same C-sequestration benefit as planting trees in plantations and like the single tree planting in hedge rows have an approx. doubling of the of the radiation capture and growth rate but would also provide visual screening of ugly buildings and provide a valuable local ecosystem with its own local bio-diversity enrichment.

Pathways & bridle paths - There is great potential for developing such facilities in rural areas. These could be planted with trees on the outer boundary particularly on the southern boundary of such path-ways and shade the width of the path-way or bridle-path. - more details on these to be forwarded.

Roadways - similar plantings could be done along roadways particularly on the southern side. Safe and suitable trees would have to be chosen.

Rivers & streams - as above similar plantings could be done along rivers and streams particularly on the southern side. Safe and suitable trees would have to be chosen and on certain fishing rivers stretches suitable for planting and not for planting would need to be identified by Inland Fisheries. Fish need food and certain parts of rivers need solar radiation to grow that food. Planting in such areas may be part of schemes to delineate areas of public access and separate riverbank areas from farmland.

References and more details to follow

More References:
Continued from Question 2
On the Observational Determination of Climate Sensitivity and Its Implications
Richard S. Lindzen1 and Yong-Sang Choi2

1Program in Atmospheres, Oceans, and Climate, Massachusetts Institute of Technology, Cambridge, U. S. A.
2Department of Environmental Science and Engineering, Ewha Womans University, Seoul, Korea


Abstract:
We estimate climate sensitivity from observations, using the deseasonalized fluctuations in sea surface temperatures (SSTs) and the concurrent fluctuations in the top-of-atmosphere (TOA) outgoing radiation from the ERBE (1985-1999) and CERES (2000-2008) satellite instruments. Distinct periods of warming and cooling in the SSTs were used to evaluate feedbacks. An earlier study (Lindzen and Choi, 2009) was subject to significant criticisms. The present paper is an expansion of the earlier paper where the various criticisms are taken into account. The present analysis accounts for the 72 day precession period for the ERBE satellite in a more appropriate manner than in the earlier paper. We develop a method to distinguish noise in the outgoing radiation as well as radiation changes that are forcing SST changes from those radiation changes that constitute feedbacks to changes in SST. We demonstrate that our new method does moderately well in distinguishing positive from negative feedbacks and in quantifying negative feedbacks. In contrast, we show that simple regression methods used by several existing papers generally exaggerate positive feedbacks and even show positive feedbacks when actual feedbacks are negative. We argue that feedbacks are largely concentrated in the tropics, and the tropical feedbacks can be adjusted to account for their impact on the globe as a whole. Indeed, we show that including all CERES data (not just from the tropics) leads to results similar to what are obtained for the tropics alone – though with more noise. We again find that the outgoing radiation resulting from SST fluctuations exceeds the zero feedback response thus implying negative feedback. In contrast to this, the calculated TOA outgoing radiation fluxes from 11 atmospheric models forced by the observed SST are less than the zero feedback response, consistent with the positive feedbacks that characterize these models. The results imply that the models are exaggerating climate sensitivity

Article (PDF Available) · May 2016 with 70 Reads
DOI: 10.1002/2015EA000154
Cite this publication Earth and Space Science Vol 3 2016/05/01

John Ray Bates
University College Dublin

Abstract
Estimates of $2 \times CO_2$ equilibrium climate sensitivity (EqCS) derive from running global climate models (GCMs) to equilibrium. Estimates of effective climate sensitivity (EfCS) are the corresponding quantities obtained using transient GCM output or observations. The EfCS approach uses an accompanying energy balance model (EBM), the zero-dimensional model (ZDM) being standard. GCM values of EqCS and EfCS vary widely [Intergovernmental Panel on Climate Change range: (1.5, 4.5)°C] and have failed to converge over the past 35 years. Recently, attempts have been made to refine the EfCS approach by using two-zone (tropical/extratropical) EBMs. When applied using satellite radiation data, these give low and tightly constrained EfCS values, in the neighborhood of 1°C. These low observational EfCS/two-zone EBM values have been questioned because (a) they disagree with higher observational EfCS/ZDM values and (b) the EfCS/two-zone EBM values given by GCMs are poorly correlated with the standard GCM sensitivity estimates. The validity of the low observational EfCS/two-zone EBM values has been explored, with focus on the limitations of the observational EfCS/ZDM approach, the disagreement between the GCM and observational radiative responses to surface temperature perturbations in the tropics, and on the modified EfCS values provided by an extended two-zone EBM that includes an explicit parameterization of dynamical heat transport. The results support the low observational EfCS/two-zone EBM values, indicating that objections (a) and (b) to these values both need to be reconsidered. It is shown that in the EBM with explicit dynamical heat transport the traditional formulism of climate feedbacks can break down because of lack of additivity.

See also:
- Deficiencies in the IPCC’s Special Report on 1.5 Degrees (Revised, 21 January 2019)

More References to follow