I consider myself literate in matters meteorological and climatological. I have dealt with real weather and climate all my professional life as a retired senior airline captain and understand the physics and mathematics well, having a master’s in engineering from UCD and am a Fellow of the Royal Aeronautical Society. I have encountered and handled severe weather all over the world in my career and my observation is that, anecdotally, the current severe weather is always the worst since records began and unprecedented. However, if one looks back in the records, you will find it is not so, storm Ophelia for example, was not even in the top ten storms in Ireland!

I made a substantial submission to the Citizens on the topic: “How the State can make Ireland a Leader in Tackling Climate Change.” The paper I submitted deals with the occurrences of extreme weather events in relation to Ireland and my research using data from Met Eireann, disputed much of the information in the 2013 fact sheet issued by the EPA and presented as one of the main information documents for the Citizens. My paper, although on time, was “inadvertently” omitted from the original list which was circulated to members before the first meeting. I know four others whose papers were similarly inadvertently omitted. I sent my paper to the EPA for information but got no feedback other than a curt acknowledgement. The conclusion of my research was: From my analysis of the Met Eireann data, it is my opinion that weather in Ireland, instead of getting more extreme, as predicted in some climate models, is actually getting less extreme. An up to date version of my paper is attached as my submission as well as my filled in form.

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

Consultation Questionnaire

The Department of Agriculture, Food and the Marine welcomes feedback on the Draft Climate Change Adaptation Sectoral Plan for the Agriculture, Forest and Seafood sector.

Please consider the Draft Climate Change Adaptation Sectoral Plan before submitting a response. All opinions are welcome and will be considered in the further development of the Adaptation Plan.

Terms and Conditions

All submissions, including the name of the person making the submission, will be published on the Department's website.

Freedom of Information

All submissions and comments submitted to the Department for this purpose are subject to release under the Freedom of Information (FOI) Act 2014 and the European Communities (Access to Information on the Environment) Regulations 2007-2014. Submissions are also subject to Data Protection legislation.

Personal, confidential or commercially sensitive information should not be included in your submission and it will be presumed that all information contained in your submission is releasable under the Freedom of Information Act 2014.

Data Protection

Please note that if you make a submission you are agreeing for it to be published in accordance with the EU General Data Protection Regulation (GDPR EU 2016/679), the Data Protection Acts 1988-2018, the Freedom of Information Act 2014 and the DPER Consultation Principles and Guidance.
Privacy Statement

The Department of Agriculture, Food and the Marine is committed to protecting and respecting your privacy and employs appropriate technical and organisational measures to protect your information from unauthorised access. The Department will not process your personal data for any purpose other than that for which they were collected. Personal data may be exchanged with other Government Departments, local authorities, agencies under the aegis of the Department, or other public bodies, in certain circumstances where this is provided for by law.

The Department will only retain your personal data for as long as it is necessary for the purposes for which they were collected and subsequently processed. When the business need to retain this information has expired, it will be examined with a view to destroying the personal data as soon as possible, and in line with Department policy. Further information on Data Protection can be found on our website at: https://www.agriculture.gov.ie/dataprotection/informationondataprotection/

1. Details:

Full Name: ____________________________

Organisation where applicable: ____________________________
or

Member of the public: X  

Subsector:

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

Other: Country Dweller

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?
3. What do you think the main impacts from climate change will be on the agriculture, forest and seafood sectors?

Please Explain: Climate is always changing so I expect the future to be more or less the same as the past with minor changes.

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

Please Explain: As they always have, listen to the forecast and adapt to the weather expected

5. Where do you get climate related information?
6. What additional information do those working in the sector need to adapt to a changing climate?

Please Explain: What they are getting at the moment should be adequate but presentation on the Internet should improve.

7. How do you perceive and use weather and climate information to inform management decisions?

Please Explain: Make definite plans only about 7 days ahead.

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

Please Explain: No effect.

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

No X

Need more information

Please Explain:

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

Unsure X
Please Explain: Don’t think anything other than adaptation to the weather is needed

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

1. Better education in understanding weather
2. Plan for the future using the past as guidance
3. Refrain from reacting to extreme climate predictions based on poor research and analysis

13. Any other comments?

There is too much exaggeration of climate change. For example, storm Ophelia was Headlined as extreme yet is was not even in the top 10 storms since 1945.
Submission to Citizens’ Assembly

A BRIEF ANALYSIS OF EXTREME WEATHER TRENDS IN IRELAND
IN RECENT TIMES

11 August 2017
Updated 19 July 2019

Fintan Ryan ME, MIEI, Eur Ing, FRAeS
Chartered Engineer
Aviation Consultant, Retired Aer Lingus Senior Captain, Senior Engineer
Inmarsat

Mount Leinster - January 2017
Introduction

The Environmental Protection Agency (EPA) tells us in their Factsheet issued in 2013 (https://www.epa.ie/pubs/reports/indicators/epa_factsheet_greenhouse_v2.pdf) that: 

resulting from Climate Change we will have more extreme weather conditions including rainfall events. A link to this Factsheet is on the Citizens Assembly Website. I have studied this aspect of the document and my observations follow.

The information on Irish Extreme Weather can be found on the Met Eireann Website:
https://www.met.ie/climate/weather-extreme-records

Temperature

Highest air temperature: 33.3°C at Kilkenny Castle on 26th June 1887. Highest air temperature recorded during the 20th Century was 32.5°C at Boora, Co. Offaly on 29th June 1976

Lowest air temperature: -19.1°C at Markree Castle, Co. Sligo on 16th January 1881.
Lowest air temperature recorded 20th century air temperature was -18.8°C at Lullymore, Co. Kildare on 2nd January 1979.

Figure 1 below shows the ranking order of the warmest years (max temperatures) since 1949 at Dublin Airport. It can be seen that the year 2018 was the 8th warmest over that period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Order</th>
<th>T °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>Aug</td>
<td>1</td>
<td>28.7</td>
</tr>
<tr>
<td>1983</td>
<td>July</td>
<td>2</td>
<td>27.6</td>
</tr>
<tr>
<td>1989</td>
<td>July</td>
<td>3</td>
<td>27.5</td>
</tr>
<tr>
<td>1995</td>
<td>Aug</td>
<td>4</td>
<td>27.1</td>
</tr>
<tr>
<td>2001</td>
<td>July</td>
<td>5</td>
<td>26.9</td>
</tr>
<tr>
<td>1983</td>
<td>August</td>
<td>6</td>
<td>26.8</td>
</tr>
<tr>
<td>1995</td>
<td>July</td>
<td>7</td>
<td>26.8</td>
</tr>
<tr>
<td>2018</td>
<td>July</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>1987</td>
<td>Aug</td>
<td>9</td>
<td>26.6</td>
</tr>
<tr>
<td>2006</td>
<td>July</td>
<td>10</td>
<td>26.5</td>
</tr>
<tr>
<td>1975</td>
<td>Aug</td>
<td>11</td>
<td>26.4</td>
</tr>
<tr>
<td>2016</td>
<td>July</td>
<td>12</td>
<td>26.3</td>
</tr>
<tr>
<td>2017</td>
<td>June</td>
<td>12</td>
<td>26.3</td>
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<tr>
<td>1949</td>
<td>June</td>
<td>13</td>
<td>26.2</td>
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<tr>
<td>2013</td>
<td>July</td>
<td>14</td>
<td>26.2</td>
</tr>
<tr>
<td>1984</td>
<td>July</td>
<td>15</td>
<td>26</td>
</tr>
</tbody>
</table>

Figure 1 Ranking Order of Warmest Years at Dublin Airport 1949 - 2018

Heatwaves

A heatwave refers to a prolonged period of hot weather, which may be accompanied by high humidity. While there is no generally accepted definition of a heatwave, in Ireland it’s classified as five consecutive days with a maximum temperature in excess of 25°C

In August 1976, Birr recorded heatwave conditions lasting 14 days which is the longest duration recorded. More recently, heatwave conditions occurred in the summers of 2018, 2013, 2006, 2003, 1995, 1989, 1983 and 1976. The average duration of Irish heat waves is about 7 days. Contrary to media reports, there was no heatwave at Dublin Airport during 2018, only 2 consecutive days had temperatures over 25°C, namely, 22-23 July.
Snow
Back some 20 years ago one of the University of East Anglia's climatologists made the following statement:

within a few years winter snowfall will become “a very rare and exciting event”. “Children just aren’t going to know what snow is.” Similar statements issued from Maynooth.

However, we now know better. The severe “status red” snow from Beast from the East in March 2018 lasted a few days, was just one of 17 such snowstorms starting from 1933. As red alerts were only commenced in 2012 it could be stated “this was the first Status Red Warning for snow on record” but this is misleading, more correct to say severest snow in 6 years. The snow of 1947 lasted from late January to mid-March.

Health Aspects
According to the EPA milder winters will, on average, reduce the cold-related mortality rates among the elderly and frail but this may be offset by increases due to heat stress during summer.


However, not much stress is experienced in Ireland from heat extremes. I have checked some statistics and the mortality rate for exposure to cold in Ireland is roughly seven times higher than that from exposure to heat. Fig 2 below shows the relationship between average temperature and mortality rate and it can be seen that when the temperature falls below about 13°C the mortality rate increases rapidly. It follows that any moderate increase in temperature would have a positive effect in reducing deaths.

http://www.bordbia.ie/consumer/gardening/GardeningArticles/ScientificArticles/7th_Scientific_Statement_Climate_Change_And_Health.pdf
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1060696/?page=3
Conclusion on temperature

Whilst it is agreed, according to the data used, the temperature in Ireland has increased by 0.8°C in the last 110 years, there is not much evidence so far to support the hypothesis that there will be increasing episodes of extreme heat. On the contrary, the highest ten temperatures recorded at Dublin Airport were all more than 8 years ago. The heat waves seem to be more or less evenly distributed. As regards health, any moderate increase in temperature would have a very positive effect in reducing death rates.

Wind Speed

According to Met Eireann the highest wind speed in a gust was 98kts at Malin Head, Co. Donegal on 16th September 1961.

Highest 10-minute mean wind speed was 71kts at Foynes, Co. Limerick on 18th January 1945.

Looking at Met Eireann Data I plotted the chart for Malin Head, probably the windiest point in Ireland, Fig 3 below. I also plotted Mullingar, Dublin Airport and Cork Airport. The trends were all negative, that is reducing speed with time, Mullingar, an inland station, showing the steepest fall. The red dotted line is the linear trend and it can be seen that the tendency is for the wind gust speeds to decrease as you get closer to the present day.

Much has been mentioned in the media about Storm Ophelia 17 October 2107, being an extreme event. However, if one checks back on the data, this storm was not even in the top ten as regards 10 minutes sustained windspeed or gust speed since records began in the early 1940's.


Over the years covered and the locations selected the tendency is for the gust speeds to reduce. Therefore, the hypothesis that the gusts will get a lot stronger as a result of climate change is not supported by this data.

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1 Over the period January 1942 to December 2018, the measured maximum daily temperature increase at Valencia was only 0.28°C, while that at Dublin Airport was 0.84°C, three times higher. An analysis of cold days at Dublin Airport with temperatures of less than or equal to 0°C over the same time period indicated slightly more frost days in 1980-2018 than in 1942-1980, though the opposite was true of Valencia.

2 A paper by Connollys using Valentia in Kerry suggests that if only rural stations are used to measure temperature, eliminating Urban Heat Island bias, the temperature change over the last century would be more like 0.4°C. [http://oprj.net/articles/climate-science/34](http://oprj.net/articles/climate-science/34)
A recent (May 2017) study for the Royal Irish Academy by two Met Eireann scientists states: *A more recent review of storminess over the North Atlantic by Feser et al. (2015) suggests that most long-term studies show merely decadal variability for the last 100–150 years, and that there is no evidence of a sustained long-term trend. In summary, much uncertainty still remains regarding future changes in the frequency and wind severity of storms affecting Ireland.*

https://www.ria.ie/sites/default/files/climate-change-storminess_0.pdf

**Rainfall and Flooding**

**Rainfall Rate**  
According to Met Eireann  

Highest annual total: 3964.9mm at Ballaghbeama Gap in 1960.  

Highest monthly total: 943mm at Cork December 2015.  

Highest daily total: 243.5mm at Clonlara, County Kerry on 18 September 1993.  

Highest hourly total: 52.2mm at Clonroche, County Wexford on 27th June 1986.  

Lowest annual total was in 1887 with 356.6mm of rain recorded at Glasnevin, Dublin.  

Longest absolute drought was in Limerick from 3rd April to 10th May 1938.  

Using the data provided by Met Eireann one can deduce that rainfall rates either increased or decreased over the duration, depending on the choice of start and end years. For example, for Malin Head, the trend 1991 to 2010 decreases but the trend from 1981 to 2010 is increasing, the opposite to what you would expect!
Flooding

Reliable historical flooding data is very difficult to find. It depends on so many variables such as drainage, land use, new buildings and previous heavy rains saturating the ground. Even correlating rainfall rate with flooding is difficult for the same reasons, the same rain rate will cause different levels of flooding depending on many variables including frost.

A recent UK paper states: “The apparent increase in flooding witnessed over the last decade appears in consideration to the long-term flood record not to be unprecedented; whilst the period since 2000 has been considered as flood-rich, the period 1970–2000 is “flood poor”, which may partly explain why recent floods are often perceived as extreme events. The much publicised (popular media) apparent change in flood frequency since 2000 may reflect natural variability, as there appears to be no shift in long-term flood frequency.”

https://www.thegwpf.com/new-study-scientists-find-recent-uk-flooding-not-unprecedented/

One often hears statements like this from a Minister in Graiguenamanagh on December 30th, 2015: “We have had flooding in the past but nothing ever like this.” However, in 1947 I lived in Graiguenamanagh and remember very clearly levels of flooding way higher than those shown in Figure 4 below.

New Research

This from EPA Guidance Document 2015:

Projections are for wetter winters and drier summers. For spatial variations, results are more uncertain and indicate wetter winters in the west and drier summers in the east.


However, this from a document just released 10 Aug 2017:

Flooding on the east coast of Ireland and parts of southern England is occurring earlier in Autumn because soils in these regions are becoming saturated sooner due to wetter autumns and summers, ...


Figure 4 Flooding Graiguenamanagh Dec 2015
Conclusion

From my analysis of the Met Eireann data, it is my opinion that weather in Ireland, instead of getting more extreme, as predicted in some climate models, is actually getting less extreme.

Acknowledgement

Many thanks to Met Eireann for use of historical data which is freely available on their website.