



**IEAGHG Information Paper: 2015-IP26; Extreme Weather and Climate Change**  
– *“The proof if is proof was needed”*.

A new report entitled: **Explaining Extreme Events of 2014 from a Climate Perspective** has just been published. The report was published by the American Meteorological Society presents an assessments of how climate change may have affected the strength and likelihood of individual extreme events. It is the 4<sup>th</sup> in a series of reports that started in 2011 and represents the culmination of 4 years of research on this topic which has resulted in some 79 research papers being published. The full report can be found at: <https://www2.ametsoc.org/ams/index.cfm/publications/bulletin-of-the-american-meteorological-society-bams/explaining-extreme-events-from-a-climate-perspective/>

There is also an interesting summary slide show by the reports Lead editor, Stephanie Herring from NOAA<sup>1</sup> if you don't want to read the whole report, which can be found at: [www.nola.com/science/index.ssf/2015/11/human-induced\\_climate\\_change\\_g.html](http://www.nola.com/science/index.ssf/2015/11/human-induced_climate_change_g.html)

This fourth edition of explaining extreme events of the previous year (2014) from a climate perspective is considered to be the most extensive yet, with 33 different research groups from around the globe exploring the causes of 29 different events that occurred in 2014. Key conclusions were that:

- A number of this year's studies indicate that human-caused climate change greatly increased the likelihood and intensity for extreme heat waves in 2014 over various regions.
- For other types of extreme events, such as droughts, heavy rains, and winter storms, a climate change influence was found in some instances and not in others.
- The tropical cyclones that impacted Hawaii were made more likely due to human-caused climate change.
- Climate change also decreased the Antarctic sea ice extent in 2014 and increased the strength and likelihood of high sea surface temperatures in both the Atlantic and Pacific Oceans.
- In the western U.S. wildfires, no link to the individual events in 2014 was found, but the overall probability of western U.S. wildfires was considered to have increased due to human impacts on the climate.

For the first time the researchers also considered other human caused drivers of extreme events beyond the usual radiative drivers. For example, flooding in the Canadian prairies was found to be more likely because of human land-use changes that affect drainage mechanisms. Similarly, the Jakarta floods may have been compounded by land-use change via urban development and associated land subsidence. These types of mechanical factors they consider re-emphasize the various pathways beyond climate change by which human activity can increase regional risk of extreme events.

In summary, over half of the papers published have shown that human-caused climate change influenced an event's frequency and/or intensity in a substantial manner. Such a high percentage must surely provide comprehensive evidence that climate change is influencing extreme climate events and as the world warms as we continue to emit greenhouse gases it is likely that we are going to see more extreme climate events. Such reports therefore emphasise the need to reach an international agreement on greenhouse gas mitigation in Paris in the coming weeks.

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<sup>1</sup> National Oceanographic and Atmospheric Administration, USA