



# Preparing for Paris 2015

## Paper 4: What we can say, briefly, about the latest findings from climate science?

The Quaker United Nations Office (QUNO) seeks to promote multilateral cooperation for a fair and peaceful world. We have held consultative status through our world Quaker body since 1948, and have offices in Geneva, New York, and a meeting space in Bonn. Our areas of work include the Human Impacts of Climate Change, Peacebuilding and the Prevention of Violent Conflict, Food and Sustainability, and Human Rights and Refugees.

Our work is often done behind the scenes to help facilitate a constructive outcome to negotiations such as the development of the Human Rights Council (2000s) and the Landmine Ban Treaty (1990s). Our previous work in UN environmental processes includes support for negotiations on the Convention on Desertification, the Convention on Biological Diversity and the 1992 Earth Summit preparations. QUNO also chaired the NGO Committee for the 1972 UN Conference on the Human Environment.

The international climate negotiations are among the most complex and profound in human history. Countries with different economic, political, social and environmental circumstances seek an agreement that can address present concerns and protect future generations. It is an extraordinary, and necessary, agreement to achieve.

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*The following paper is from a series of four short briefing papers, "Preparing for Paris," which QUNO has developed for the upcoming climate change conference, Conference of Parties (COP) 21, to be held in Paris in December 2015.*

*Paper Four outlines basic findings from the latest climate science report.*

### Climate change as a symptom of a greater challenge

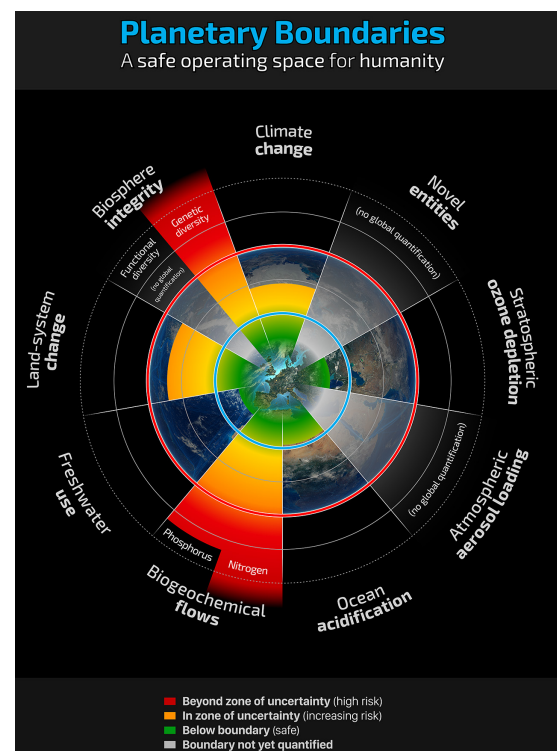
At QUNO, we view climate change due to human (anthropogenic) activities to be a symptom of a greater challenge: how to live sustainably and justly on planet Earth. We recognise that a lack of sufficient action to address the root causes of anthropogenic climate change threatens the collapse of current eco-systems and in turn that of living species, including our own. We recognise that the most vulnerable communities now, and all our future generations, will not suffer profoundly if humanity chooses to act urgently, fairly and sufficiently.

### What we can say "we know" about climate change?

In 2009, the Stockholm Resilience Centre (SRC) defined nine planetary processes, and identified boundaries for a safe operating space for humanity. Image A (right) visualizes the inter-linkages between these Earth processes. It shows biodiversity of living species as well as biochemical flows (in particular nitrogen in agriculture) as experiencing the greatest stress, with a serious change in our current climate system if anthropogenic greenhouse gas (GHG) emissions are not sufficiently decreased.

But the inter-linkages are also a reminder that positive change in human actions to help heal one process can simultaneously help to heal others. The human activities which are fundamental in altering our climate system, primarily the combustion of fossil fuels, deforestation and unsustainable land use, also add to crises in other planetary processes.<sup>1</sup>

#### a. Planetary Boundaries



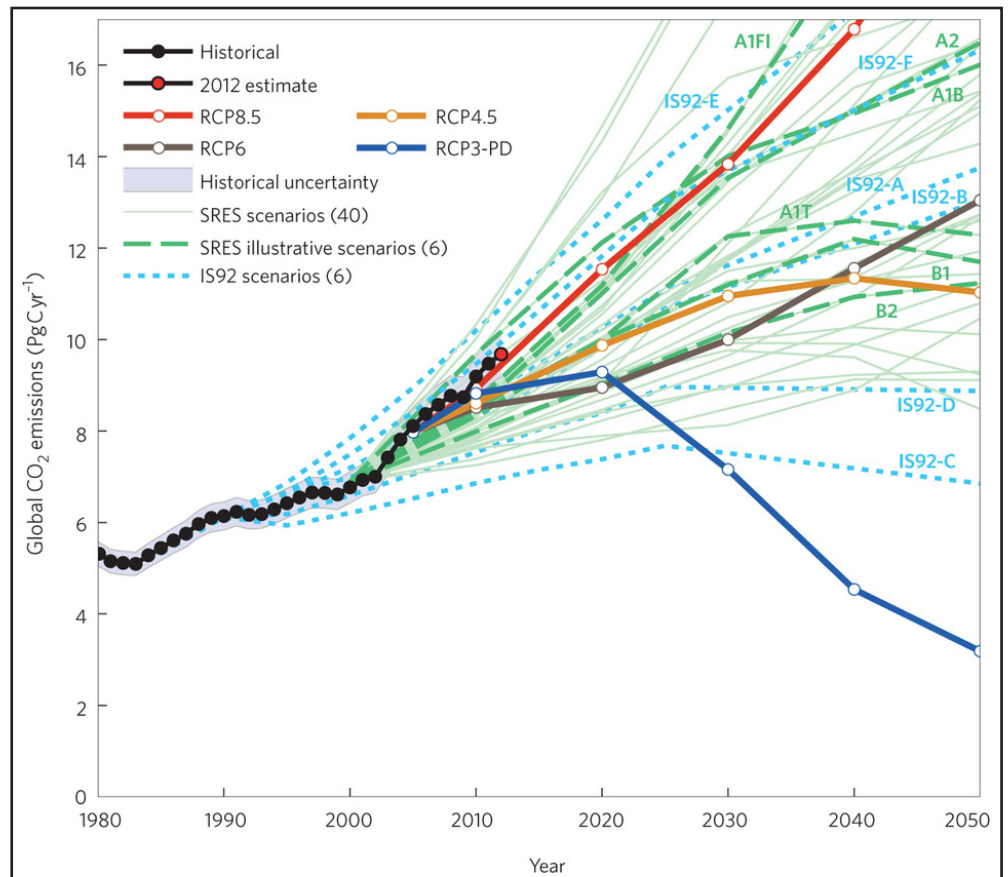
<sup>1</sup> For more information, please refer to Paper 2, Preparing for Paris, as well as The Nine Planetary Boundaries: <http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html>

In 2013-2014, the Intergovernmental Panel on Climate Change (IPCC) released the 5th Assessment Report (AR5). The AR5 is the most comprehensive collation of climate science in existence, taking over five years of work and involving several thousand experts serving as authors and reviewers, most of whom helped on a voluntary basis.

While this information is available to all in print and at [ipcc.ch](http://ipcc.ch), it is often overwhelming at first to digest. Yet a basic understanding of climate science findings can enable us to recognise the urgency of the situation, and identify steps that we, as a human society, can take to ensure that anthropogenic climate change does not reach catastrophic levels.<sup>2</sup>

There is still time to ensure the protection of our future generations, but not a great deal of time.

**b. Historical Emissions**



*This chart<sup>4</sup> shows the historical and current emissions (up to 2012), in relation to various “pathways” for action or inaction. At the moment, global emissions are above the “business as usual” pathway, known as RCP 8.5, which is leading to global surface mean temperature rises at rates unprecedented in human history, placing current eco-systems at threat for collapse.*

Below is a simple outline of “what we know”:

1. The Earth’s global mean surface temperature already warmed 0.85°C between 1880 and 2012.<sup>3</sup>
2. Warming from the most recent Ice Age (approximately 20,000 years ago) to our current Holocene was much more gradual, about 0.5°C to 1°C rise in global mean surface temperature per 1,000 years. The climate system is now warming at unprecedented rates in our human history.
3. While climate change is natural, anthropogenic (due to human activities) climate change is not natural.
4. Our human activities are primarily responsible for the current global warming. Atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. CO2 concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and then net land use change emissions.<sup>5</sup>
5. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification.

<sup>2</sup> Ibid.

<sup>3</sup> Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, Working Group I, ‘The Physical Science Basis’, Summary for Policy Makers, page 3, [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5-SPM\\_brochure\\_en.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5-SPM_brochure_en.pdf)

<sup>4</sup> Glen P. Peters, Robbie M. Andrew, Tom Boden, Josep G. Canadell, Philippe Ciais, Corinne Le Quéré, Gregg Marland, Michael R. Raupach and Charlie Wilson (collaboration of the Global Carbon Project) in Nature Climate Change, online publication, 2 December 2012, p.2

<sup>5</sup> Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, Working Group I, ‘The Physical Science Basis’, Summary for Policy Makers, page 9, [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5-SPM\\_brochure\\_en.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5-SPM_brochure_en.pdf)

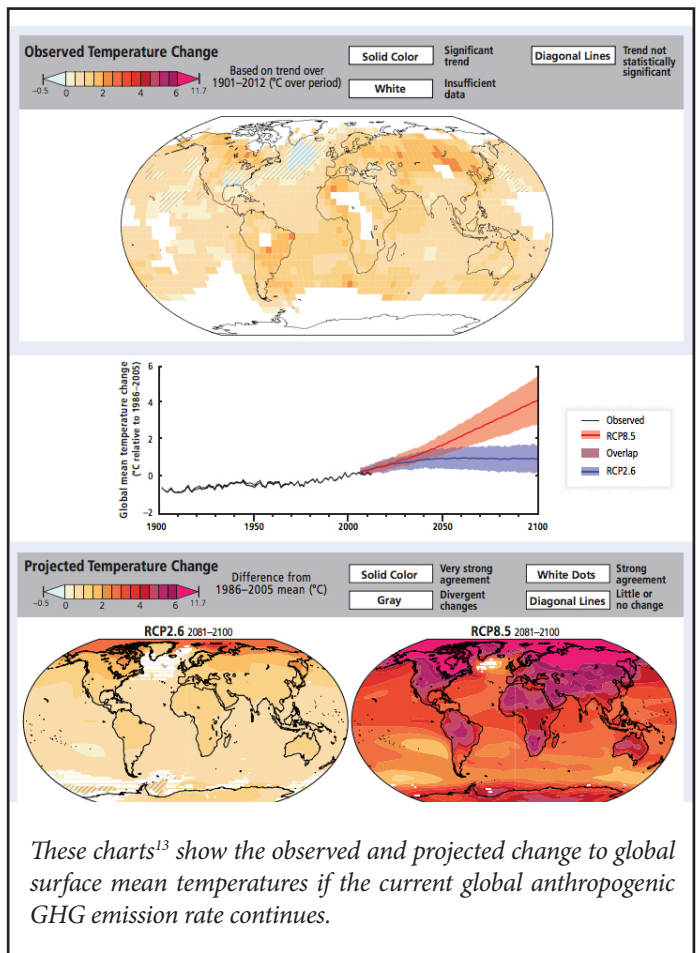
6. Climate change already affects people and ecosystems, including reductions in snowpack and crop yields, increased coastal erosion, changes in where plants and animals live, increases in wildfires and tree mortality, and consequences for indigenous livelihoods.<sup>6</sup>
7. Greater magnitudes of warming increase the likelihood, severity and irreversibility of existing problems relating to food and water insecurity, extreme weather events and biodiversity loss.<sup>7</sup>
8. Since 2010, GHG emissions were rising more quickly than ever before, driven mainly by economic growth and by population growth.<sup>8</sup> However, in 2014, GHG emissions appeared to stabilize while economic growth continued, an encouraging sign.
9. Temperatures have exceeded global annual averages for 38 consecutive years.<sup>9</sup>
10. The Arctic is experiencing the fastest warming. This results not only in the melting of ice sheets, which raise sea levels, but also in the melting of permafrost, which releases methane, a more powerful GHG than CO<sub>2</sub>.
11. People, societies, and ecosystems around the world are vulnerable and exposed to climate change, but in different ways. Vulnerability can be concentrated among the poorest and most marginalized, but at the same time, wealth is not necessarily protection. Even highly developed urban regions grapple with large damages resulting from the vulnerability and exposure of people and assets.<sup>10</sup>
12. If we carry on with our “business as usual” GHG emission rate, we will likely experience a global mean temperature increase of 3.7-4.8°C by 2100, compared to pre-industrial levels. The range is 2.5C

up to 7.8°C when including climate uncertainty.<sup>11</sup>

13. Effective climate change responses can be a way to build a richer, more resilient, fundamentally more vibrant world. For example, access to low-carbon energy can improve health and livelihoods, while also protecting the climate.<sup>12</sup>
14. The cost of lowering (mitigating) GHG emissions now would be relatively inexpensive compared to the “cost” of delaying action, which would likely lead to eco-system collapse threatening the existence of current species, including ours.

In conclusion, we have the knowledge and resources to address the root causes of anthropogenic climate change. Our actions now, personal and collective, are the legacy we leave our children.

*c. Changes under “business as usual”*



These charts<sup>13</sup> show the observed and projected change to global surface mean temperatures if the current global anthropogenic GHG emission rate continues.

6 Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, Working Group II, ‘Impacts, Adaptation and Vulnerability’, Summary for Policy Makers, pages 30-32, [ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf)  
 7 Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, Working Group II, ‘Impacts, Adaptation and Vulnerability’, Summary for Policy Makers, pages 11-13, [ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf)  
 8 Climate Change 2014, The Synthesis Report, p.1 [ipcc.ch/news\\_and\\_events/docs/ar5/ar5\\_syr\\_headlines\\_en.pdf](http://ipcc.ch/news_and_events/docs/ar5/ar5_syr_headlines_en.pdf)  
 9 World Resources Institute, [wri.org/our-work/top-ics/climate](http://wri.org/our-work/top-ics/climate)  
 10 Katharine Mach, Director of Science, IPCC Working Group II Technical Support Unit.

11 Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report, Working Group III Summary for Policy Makers, p.8 [ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc\\_wg3\\_ar5\\_summary-for-policymakers.pdf](http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf)  
 12 Ibid.  
 13 IPCC 5th Assessment Report, Working Group II, Summary for Policy Makers, page 10, [ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf)