

'Many parts of Earth could become uninhabitable': Study's grim warning

Blake Foden, 7 August 2018

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Many parts of Earth could become uninhabitable for humans, with the planet at risk of entering an irreversible "hothouse" climate.

That's the alarming warning from an international team of scientists, including Australian National University professor Will Steffen, in a study published on Tuesday.

As large parts of eastern Australia battle drought and Europe is gripped by a heatwave, Professor Steffen said current efforts to combat global warming would not be enough to meet the emission-reduction targets set by governments in the Paris Agreement, which may be insufficient to prevent the dangerous scenario anyway.

The study warns that Earth is already more than halfway towards the point of no return.

Global average temperatures are just over one degree above pre-industrial temperatures, but rising by 0.17 degrees every 10 years.

Professor Steffen said if temperatures rose to two degrees above pre-industrial levels, a level within Paris Agreement targets, it could trigger natural processes that would cause further warming of the Earth even if all human emissions ceased.

If that happened, global average temperatures may reach up to five degrees above pre-industrial levels - the hottest temperatures experienced in more than 1.2 million years.

Sea levels could also rise between 10 and 60 metres, threatening coastal areas.

"Many parts of the planet could become uninhabitable for humans," Professor Steffen said.

"... Sitting on our hands means we are at risk of driving the Earth - and human wellbeing - beyond an irreversible point of no return."

The study, titled *Trajectories of the Earth System in the Anthropocene*, says temperatures could hit the level needed to send the planet down the "Hothouse Earth" path in just a few decades.

"The impacts of a Hothouse Earth pathway on human societies would likely be massive, sometimes abrupt, and undoubtedly disruptive," says the study, which is published in the journal *Proceedings of the National Academy of Sciences of the United States of America*.

Professor Steffen said scientists considered 10 natural feedback processes as part of the study, some of which were "tipping elements" that could lead to abrupt changes if a critical threshold was crossed.

Those elements included the reduction of Antarctic sea ice and polar sheets, the release of methane trapped on the ocean floor and Amazon rainforest dieback.

"The real concern is these tipping elements can act like a row of dominoes," Professor Steffen said.

"Once one is pushed over, it pushes Earth towards another.

"It may be very difficult or impossible to stop the whole row of dominoes from tumbling over."

The impacts on arguably Australia's most notable natural attraction, the Great Barrier Reef, would be severe.

"A Hothouse Earth trajectory would almost certainly flood deltaic environments, increase the risk of damage from coastal storms, and eliminate coral reefs ... by the end of this century or earlier," the study says.