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Humanity urged to make best use of 'borrowed time'

Humans may be able to avert major environmental catastrophes that now loom if we learn to make better use of 'borrowed time', according to an eminent Australian marine biologist.

Credit: Alice Bailey

'There is mounting evidence that we have already passed or may soon pass several critical boundaries affecting life on Earth, as well as our own future wellbeing,' says the director of the ARC Centre of Excellence for Coral Reef Studies at James Cook University, Professor Terry Hughes.

Prof. Hughes' comments come as government leaders from around the world gather in Doha for the United Nation's Climate Conference (Nov 26-Dec 7) to try to impart new momentum to stalled efforts to prevent 4-6 degrees of global warming.

He is lead author of a new paper by an international scientific team in the journal Trends in Ecology and Evolution (TREE) which argues that while more and more of the planet's environments are approaching major regime shifts – or points-of-no-return – there may still be time to save them.

The pressure of human activities and demands on the planet's resources is shifting many of its familiar ecosystems to unfamiliar states, often much less productive and less able to support ourselves and other life, Prof. Hughes explains. These are known as 'tipping points' or regime changes.

'For example, there are signs the Arctic will soon shift to an ice-free condition in summer, which is a profound change, occurring just in our lifetime. In the Amazon Basin, clearing of jungle could move the whole region to a much drier state. Both of these changes affect human livelihoods as well as wildlife.

'In coral reefs, too, we see the impact of bleaching and other human pressures causing a shift from a coral-dominated

ecosystem to one dominated by seaweeds, in which the rich diversity of the reef is lost. This in turn directly affects hundreds of millions of humans whose livelihoods depend on coral reefs,' Prof. Hughes says.

However the scientists say the good news is that many of these profound shifts take place over quite long time periods – decades or even centuries – and this gives humanity time to act wisely to prevent irreversible and dangerous damage from occurring.

'In effect we are living dangerously, on borrowed time – and we need to learn how to take early action to prevent ecosystems from approaching a tipping point,' he says.

The researchers say that when the decline in an ecosystem is sudden and dramatic, this often prompts society to take action.

Of greater concern is where the ecosystem degrades steadily over years or even generations before flipping into a new, unproductive state. It is human nature that we often fail to notice this gradual change.

'The human imagination is poorly equipped for dealing with distant future events that contemporary generations unconsciously discount,' the researchers say.

For example, 'it is hard enough to reach a societal consensus that anthropogenic climate change is real today – let alone to convince people of the longer-term threat (from current greenhouse gas emissions) of acidification in the deep ocean in 500–2000 years from now,' they add.

Today it appears 'that human activities are already slowly pushing many ecological and Earth systems closer to regional- and planetary-scale thresholds' – adding that it is possible some of these have already been crossed.

'Nevertheless, delayed responses displayed by slow systems might provide an important window of opportunity to navigate to a safer state,' they conclude.

'The most important slow regime-shift is a social one: convincing enough people to move away from 'business-as-usual' thinking before time runs out,' Professor Hughes says. 'Today this is a challenge for governments, managers, scientists and society alike, all over the world.'

The article 'Living dangerously on borrowed time during slow, unrecognized regime shifts' by Terry P. Hughes, Cristina Linares, Vasilis Dakos, Ingrid A. van de Leemput and Egbert H Van Nes, appears in the online journal *Trends in Ecology and Evolution* (TREE).

Source: ARC Centre of Excellence for Coral Reef Studies

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