

The Anthropocene is here: scientists

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A composite image of the Western hemisphere of the Earth. Credit: NASA

The human impact on Earth's chemistry and climate has cut short the 11,700-year-old geological epoch known as the Holocene and ushered in

a new one, scientists said Monday.

The Anthropocene, or "new age of man," would start from the mid-20th century if their recommendation—submitted Monday to the International Geological Congress in Cape Town, South Africa—is adopted.

That approval process is likely to take at least two years and requires ratification by three other academic bodies.

But after seven years of deliberation, the 35-strong Working Group has unanimously recognised the Anthropocene as a reality, and voted 30-to-three (with two abstentions) for the transition to be officially registered.

"Our working model is that the optimal boundary is the mid-20th century," said Jan Zalasiewicz, a geologist at the University of Leicester.

"If adopted—and we're a long way from that—the Holocene would finish and the Anthropocene would formally be held to have begun."

Scientists refer to the period starting from 1950 as the "Great Acceleration", and a glance at graphs tracking a number of chemical and socio-economic changes make it obvious why.

Concentrations in the air of carbon dioxide, methane and stratospheric ozone; surface temperatures, ocean acidification, marine fish harvesting, and tropical forest loss; population growth, construction of large dams, international tourism—all of them take off from about mid-century.

One of the main culprits is global warming driven by the burning of fossil fuels.

A telltale surge in the spread of invasive plant and animal species is also

a legacy of our species.

But the working group is not allowed to take any of these measures into consideration unless they show up in the geological record.

If it can't be measured in rocks, lake sediments, ice cores, or other such formations—the criteria used to determine dozens of distinct eons, era, periods and ages going back four billion years—it doesn't count.

This, however, is not a problem when it comes to the Anthropocene, said Zalasiewicz.

"We are spoiled for choice," he told AFP. "There's a whole array of potential signals out there."

Micro-plastics, for example—a synthetic, man-made substance—"are now components of sediment around the world, both in land and in the sea."

And the rise in atmospheric CO₂ shows up in ice cores reaching back tens of thousands of years.

Golden spike

Past shifts in the biosphere—the realm of the living—show up in sediment and rock, especially mass extinctions marking boundaries when up to 95 percent of all lifeforms disappeared within the geological blink of an eye.

The wipeout of non-avian dinosaurs at the end of the Cretaceous period is one such die off, though far from the most dramatic.

The word "Anthropocene"—first proposed in 2002 by Nobel chemistry

laureate Paul Crutzen—has been adopted by environmentalists as a rallying cry against Big Oil, and is viewed by some conservatives as a stalking horse for what they see as aggressive, economy-choking policies to combat climate change.

There are sceptical scientists too.

"The drive to officially recognise the Anthropocene may, in fact, be political rather than scientific," said Stanley Finney, a professor at California State University at Long Beach and chair of the International Commission on Stratigraphy—one of the bodies that must validate the new epoch.

Finney's main objection is that not enough time has elapsed for a new epoch.

"It's duration is that of an average human lifespan," he wrote in a pointed commentary, published by the Geological Society of America.

If the Anthropocene is voted into existence, scientists will have to pick a "golden spike" to mark the transition.

The spike nails down a date, but also pinpoints a primary "signal" at a specific location.

The working group was divided on what that essential signal might be, but traces of nuclear bomb explosions emerged as a favourite.

As for what form the evidence will take, Zalasiewicz said it is still early days. "Fast-growing coral form a layered archive that traps chemistry nicely," he noted.

To mark the start of the Holocene, scientists chose an ice core sample

drilled in 2003 from the central Greenland ice sheet at coordinates 75.10 degrees N/42.32 degrees W.

The core is archived in a freezer at the University of Copenhagen.

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