

Earth's shifting magnetic north pole

Magnetic north is on the move, forcing an emergency update for GPS systems which need its precise location to function accurately

Since last GPS update in 2015, magnetic north, to which compasses point, has moved towards Siberia at over 48km per year

How magnetic north has shifted

Agonic line*

Siberia (RUSSIA)

Geographic North Pole

2019

2007

2001

1994

1973

1900

1862

1590

1730

CANADA

Liquid outer core

Lower mantle

Upper mantle

Crust

Solid inner core

Pacific Ocean

Location of magnetic north believed to be controlled by two patches of magnetic field beneath Canada and Siberia

Magnetic field generated mainly by movement of liquid iron outer core – spinning ball of molten metal 3,000km below Earth's surface. Movement causes magnetic poles to shift, but cause of recent acceleration is unknown

*Imaginary line connecting north and south magnetic poles, along which compasses point to true north

Sources: NOAA, NASA, Washington Post, AFP

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