

EARTH'S MAGNETIC NORTH POLE MYSTERIOUSLY MOVING : HERE'S HOW IT WILL AFFECT THE HUMAN'S.

Bhagwat Prakash Dayma

Sr.Lecturer,
Department of Geography
Maharshi Dadhichi Mahila Mahavidhyalaya, Jodhpur.

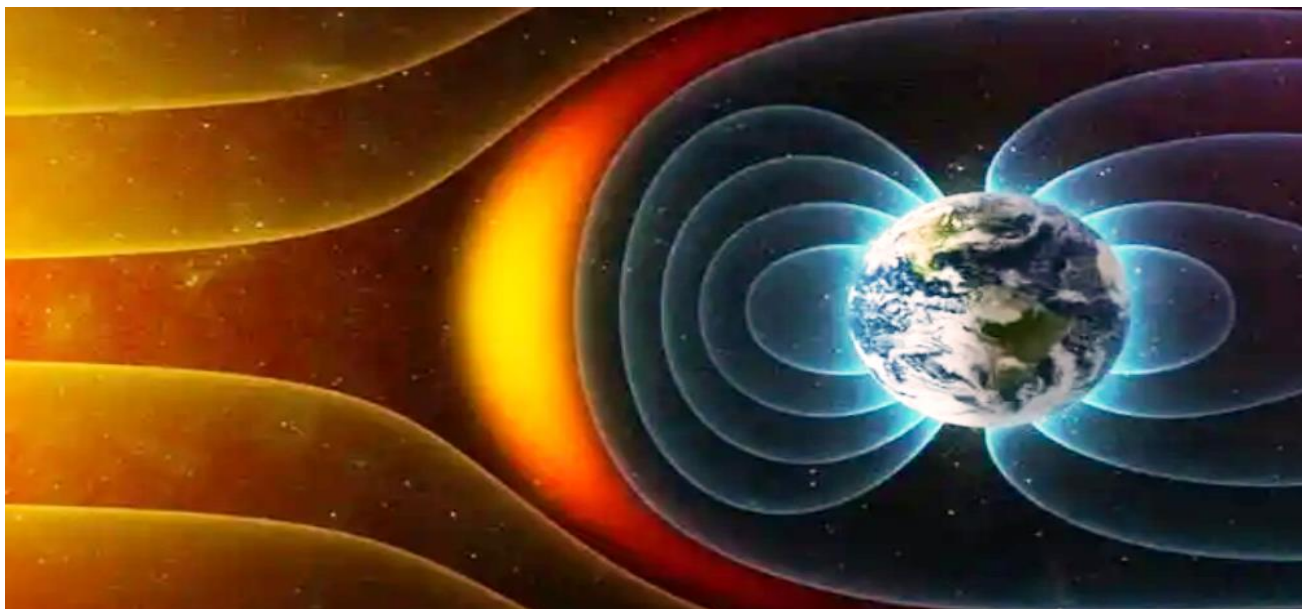
Prof.Rajendra Parihar

Chairman,
Department of Geography
Jai Narain Vyas University, Jodhpur.

Abstract

Earth's northern magnetic pole is moving quickly away from the Canadian Arctic toward Siberia. This movement has forced NCEI's scientists to update the World Magnetic Model mid-cycle.true north isn't quite where it used to be. Earth's northern magnetic pole is moving quickly away from the Canadian Arctic toward Siberia. This movement has forced NCEI's scientists to update the World Magnetic Model (WMM) mid-cycle. What does this mean? Earth's north magnetic pole has been drifting so fast in the last few decades that scientists that past estimates are no longer accurate enough for precise navigation. On Day, they released an update of where true north really was, nearly a year ahead of schedule.

The magnetic north pole is wandering about 34 miles (55 kilometers) a year. It crossed the International Date Line in 2017 and is leaving the Canadian Arctic on its way to Siberia. The US and the United Kingdom tend to update the location of the magnetic north pole every five years in December, but this update came early because of the pole's faster movement.



Earth's northern magnetic pole is moving quickly away from the Canadian Arctic toward Siberia.



Migration of the magnetic north pole over centuries.

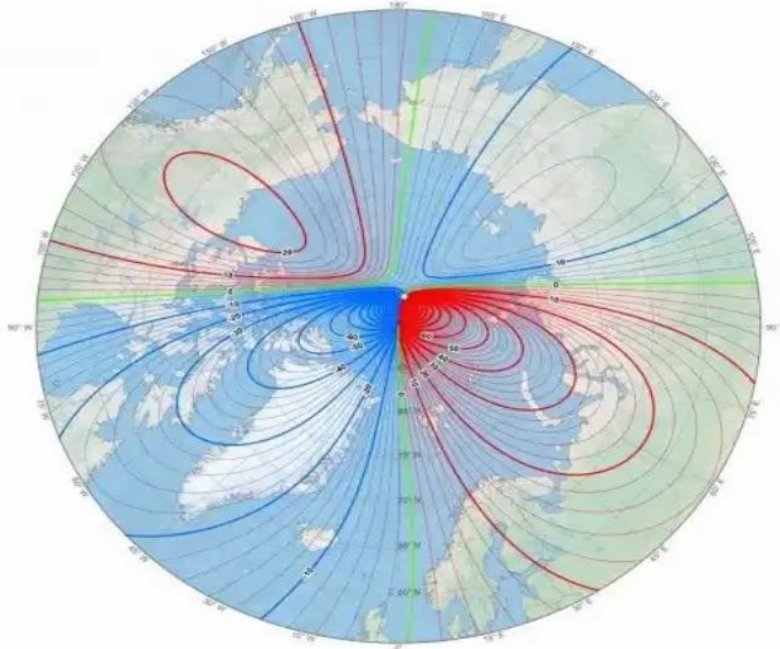
World Magnetic Model

Typically, a new and updated version of the World Magnetic Model (WMM) is released every five years. With the last release in 2015, the next version is scheduled for release at the end of 2019. Due to unplanned variations in the Arctic region, scientists have released a new model to more accurately represent the change of the magnetic field between 2015 and now.

Uses of World Magnetic Model

- The military uses the WMM for undersea and aircraft navigation, parachute deployment, and more.
- Other governmental organizations, such as NASA, the Federal Aviation Administration, US Forest Service use this technology for surveying and mapping, satellite/antenna tracking, and air traffic management.
- The constant shift is a problem for compasses in smartphones and some consumer electronics.
- Airplanes and boats also rely on magnetic north, usually as backup navigation, said University of Colorado geophysicist Arnaud Chulliat, lead author of the newly issued World Magnetic Model.
- GPS isn't affected because it's satellite-based.
- Airport runway names are based on their direction toward magnetic north and their names change when the poles move. For example, the airport in Fairbanks, Alaska, renamed a runway 1L-19R to 2L-20R in 2009.

Why is the magnetic pole moving so fast?



This map shows the location of the north magnetic pole (white star) and the magnetic declination (contour interval 2 degrees) at the beginning of 2019. (Image: NOAA NCEI/CIRES)

The movement of the magnetic north pole is pretty fast, Chulliat said. Since 1831 when it was first measured in the Canadian Arctic, it has moved about 1,400 miles (2300 kilometers) toward Siberia. Its speed jumped from about 9 mph (15 kph) to 34 mph (55 kph) since 2000.

The reason is turbulence in Earth's liquid outer core. There is a hot liquid ocean of iron and nickel in the planet's core where the motion generates an electric field, said Daniel Lathrop, geophysicist, University of Maryland, who wasn't part of the team monitoring the magnetic north pole.

"It has changes akin to weather," Lathrop said. "We might just call it magnetic weather."

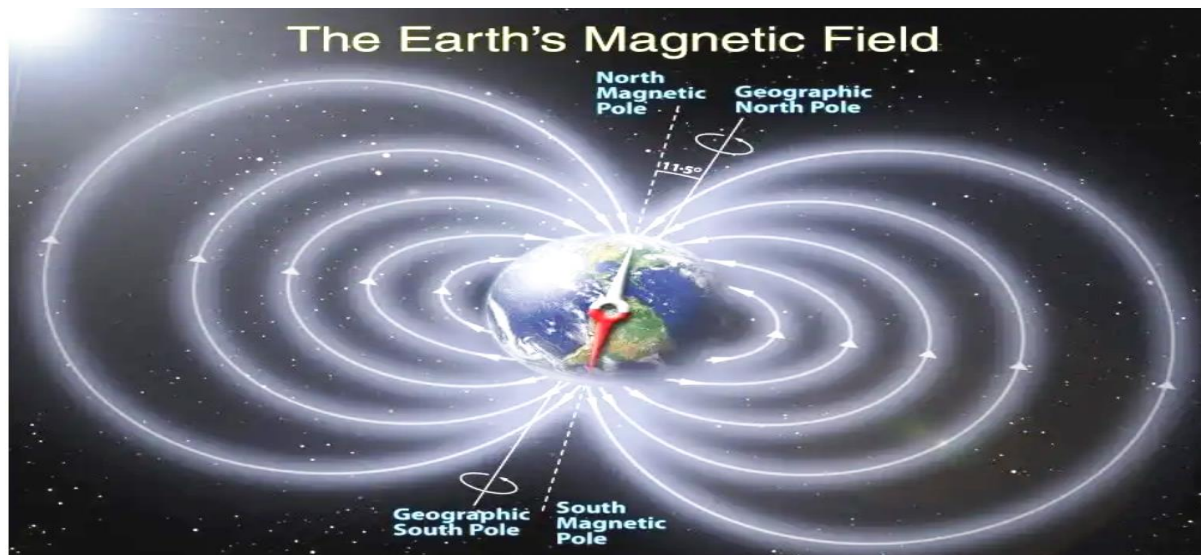
North and South pole might eventually flip

The magnetic south pole is moving far slower than the north. In general, Earth's magnetic field is getting weaker leading scientists to say that it will eventually flip, where north and south pole changes polarity, like a bar magnet flipping over. It has happened numerous times in Earth's past, but not in the last 780,000 years.

"It's not a question of if it's going to reverse, the question is when it's going to reverse," Lathrop said.

When it reverses, it won't be like a coin flip, but will take 1,000 or more years, experts said.

What is a magnetic field?



Magnetic pole reversal can throw Earth into utter chaos.(Image: NASA)

Just like the invisible force shield around the Death Star, Earth's magnetic field surrounds and protects our planet from the hottest, most statically charged particles that the sun can throw our way.

This shield -- the natural product of molten iron swirling around the planet's core -- has had our backs for billions of years and has prevented Earth from becoming an irradiated, electrified wasteland.

However, every now and then the shield lets down its guard.

Concept of magnetic pole reversal

A few times every million years or so, Earth's magnetic field reverses polarity. Imagine a giant bar magnet inside our planet got flipped upside down; iron molecules in the Earth's outer core would switch direction, the magnetic North Pole would become the magnetic South Pole, and the invisible currents of energy that make up our planet's magnetic armour would tangle and break, potentially reducing the shield's protective strength by up to 90 per cent, previous studies have suggested, according to Live Science's 6 Visions of Earth's Core. But according to WMM, partial or temporary shifts in Earth's magnetic poles can occur much, much faster than was previously thought possible -- potentially, within a single human lifetime. Lathrop sees a flip coming sooner rather than later because of the weakened magnetic field and an area over the South Atlantic has already reversed beneath Earth's surface.

That could bother some birds that use magnetic fields to navigate. And an overall weakening of the magnetic field isn't good for people and especially satellites and astronauts. The magnetic field shields Earth from some dangerous radiation.

Reference:

- India today book & web desk.
- <https://www.businessinsider.in/earths-magnetic-north>.
- <https://www.nationalgeographic.com/magnetic-north>.
- https://en.wikipedia.org/wiki/North_Pole.
- <https://blogs.ei.columbia.edu/https://blogs.ei.columbia.edu/>
- <http://earth.columbia.edu/http://earth.columbia.edu/>
- <http://www.columbia.edu/http://www.columbia.edu/>
- <https://blogs.ei.columbia.edu/>