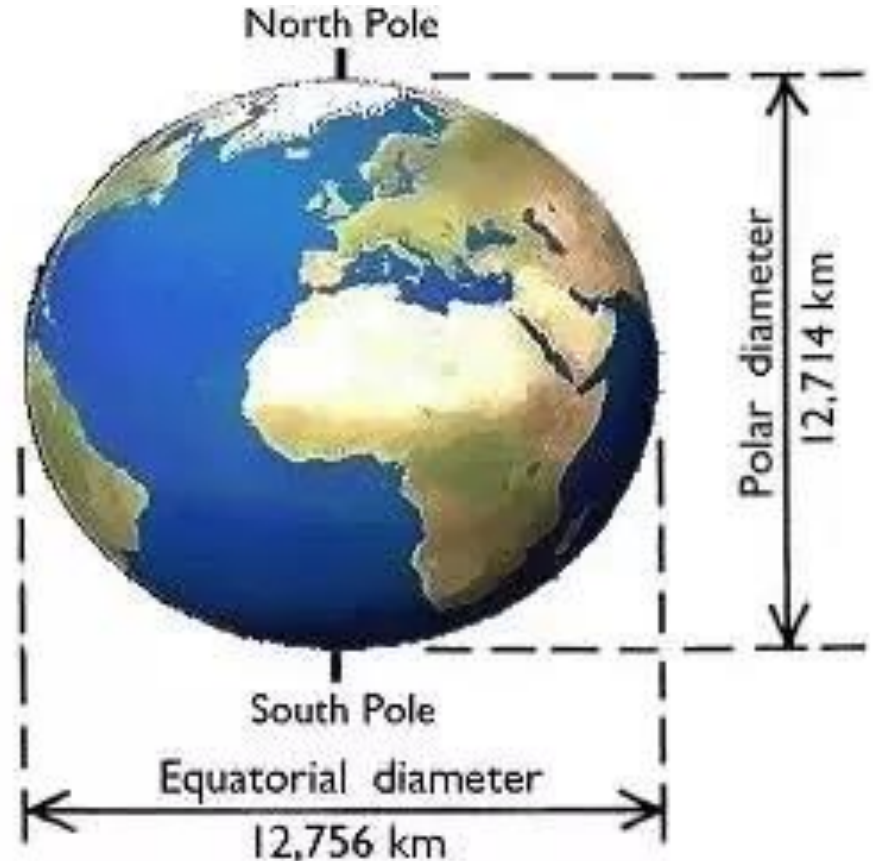


# Earth Shape and Size

- Earth shape can be described as an *oblate spheroid* which is a sphere slightly flattened along the axis from pole to pole such that there is a bulge around the middle resulting from the planet's rotation.
- The Earth's diameter at the equator is just about **0.33%** (42 km or 27 mi) larger than its pole-to-pole diameter.
- Still, Earth is so close to a spherical shape that from any point in space it looks exactly like a perfect sphere with a **mean radius of 6371.0 km (3959 miles)**!



# Horizon

The horizon or skyline is the apparent line that separates earth from sky.

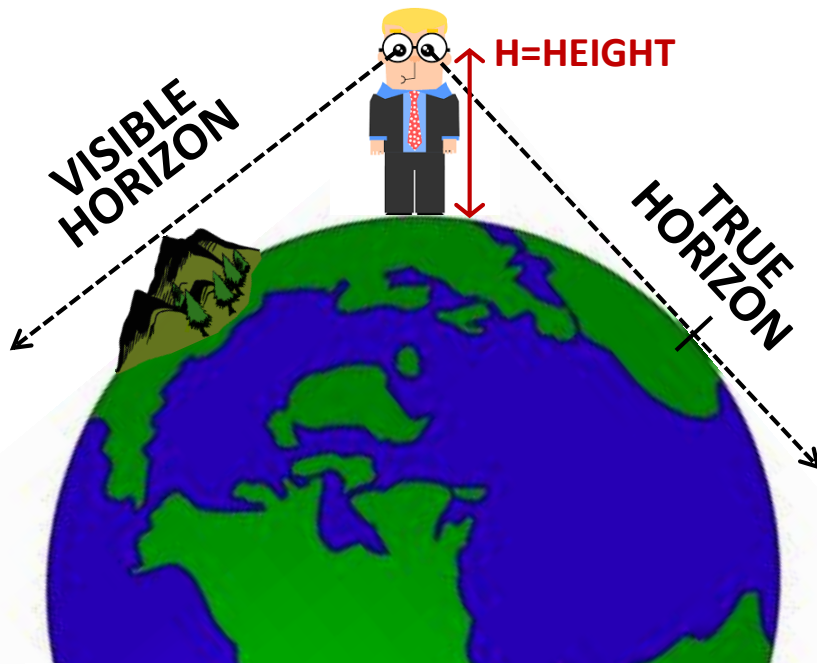
The horizon divides all visible directions into two categories: those that intersect the Earth's surface, and those that do not.

At many locations, the true horizon is obscured by trees, buildings, mountains, etc., and the resulting intersection of earth and sky is called the visible horizon.



# How Far is the Horizon?

Historically, the distance to the horizon has long been vital to survival and successful navigation, especially at sea.



OBSERVER	HEIGHT	DISTANCE to TRUE HORIZON
On the ground	1.7 m (5 ft 7 in)	4.7 km (2.9 mi)
At the Eiffel Tower observation deck	276 m (906 ft)	58.7 km (37 mi)
Atop Mount Everest	8,848 m (29,029 ft)	336 km (209 mi)

In reality, one typically sees further along the Earth's curved surface than a simple geometric calculation allows for because of downward light refraction in the atmosphere. With standard atmospheric conditions, the difference is about 8%.

# Can you see the Curve?

All aboard the **International Space Station!**



**254 miles orbit height**

<https://apod.nasa.gov/apod/ap130331.html>

# Earth and Moon from a million miles out

(via NASA/ NOAA)

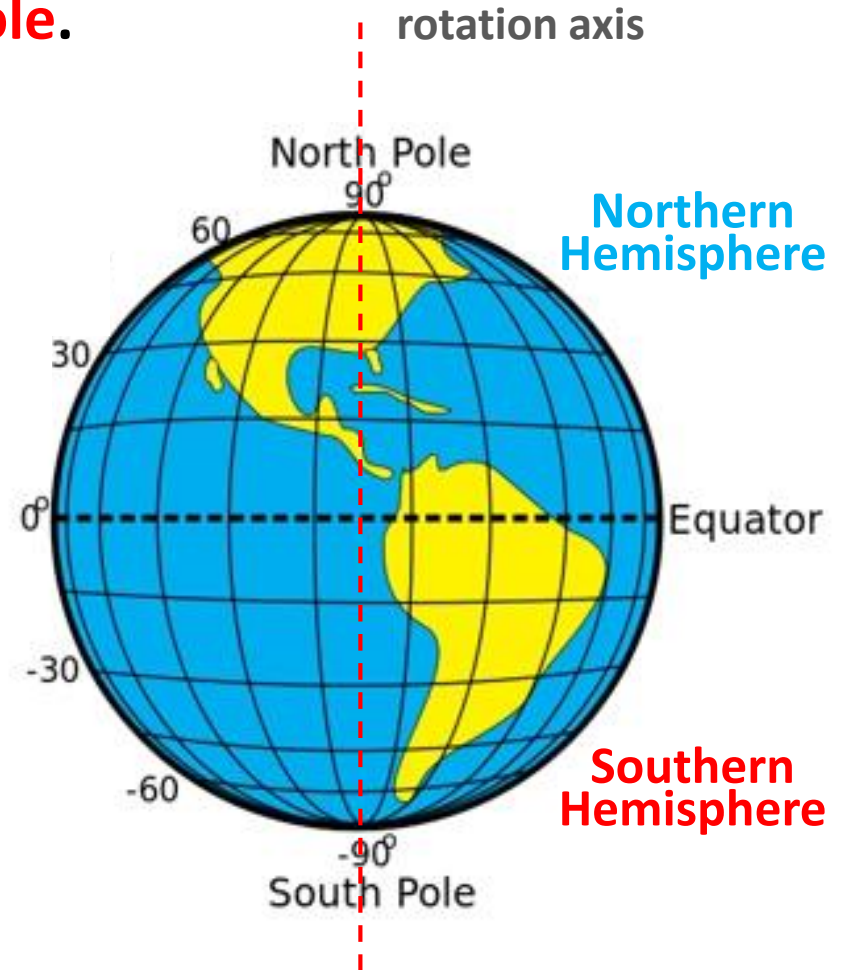


Captured by Deep Space Climate Observatory (DSCOVR) satellite

# Earth's Axis, Poles and Equator

Our planet Earth spins around on an imaginary line running through it. This line is called the Earth's axis. The two points where axis meets the surface are called the **Geographic North Pole** and the **Geographic South Pole**.

- The area around the North Pole is called the **Arctic**, while the area around the South Pole is called the **Antarctic**.
- The **Equator** is an imaginary line on the Earth's surface which is at equal distance from the North Pole and South Pole. It is about 40,075 km (24,901 mi) long; 78.7% is across water and 21.3% is over land.
- The Equator divides Earth into the **Northern Hemisphere** and **Southern Hemisphere**.



# North Pole vs South Pole

Arctic	Antarctic
What kind	of surface?
How much ice	does it have?
How much oil	does it store?
How	cold?
Unique	fauna?



# North Pole vs South Pole

Arctic	Antarctic
Basically is a frozen ocean	Continent
<i>A little bit</i> of ice	90% of all ice on Earth!
Half of the world's remaining oil deposits	No oil deposits
Temperature from $0^{\circ}\text{C}$ to $-49^{\circ}\text{C}$	Temperature from $-25^{\circ}\text{C}$ to $-72^{\circ}\text{C}$
Polar bears	Penguins

