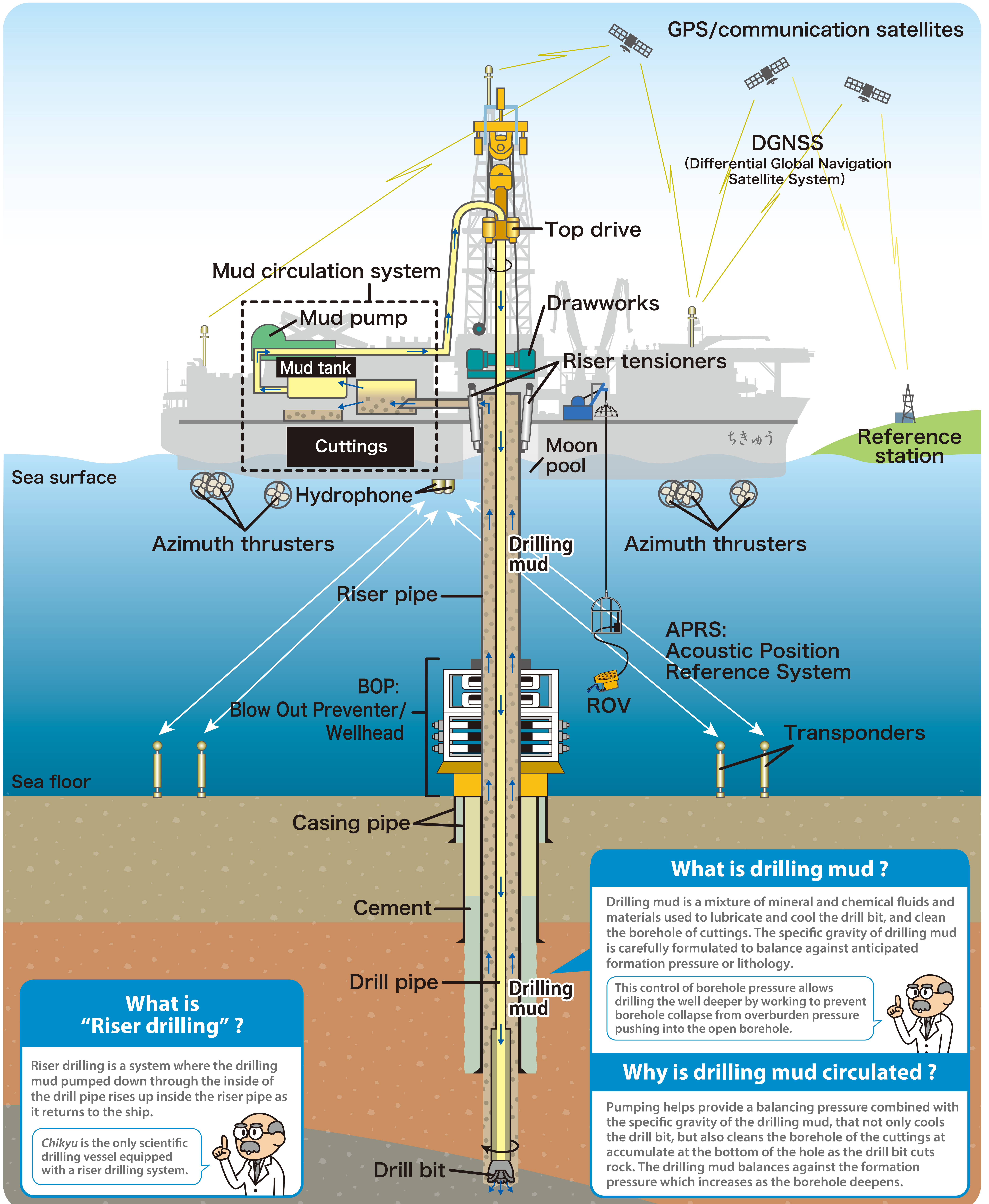


# Riser Drilling system

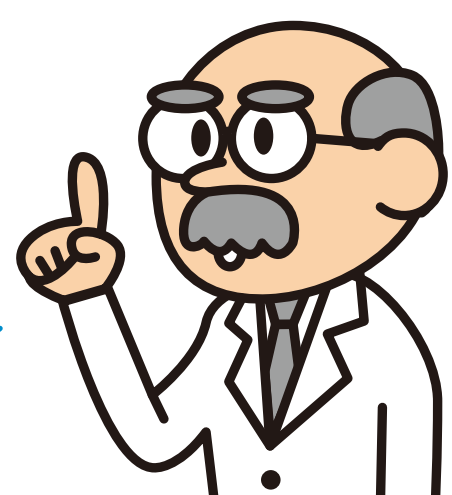
This technology allows drilling with a “closed circuit” system of drilling mud using riser pipes. These connect the ship to the wellhead on the sea floor. Drilling mud circulates through the Riser pipe and brings cuttings to the ship as it cleans the hole.



## What is “Riser drilling” ?

Riser drilling is a system where the drilling mud pumped down through the inside of the drill pipe rises up inside the riser pipe as it returns to the ship.

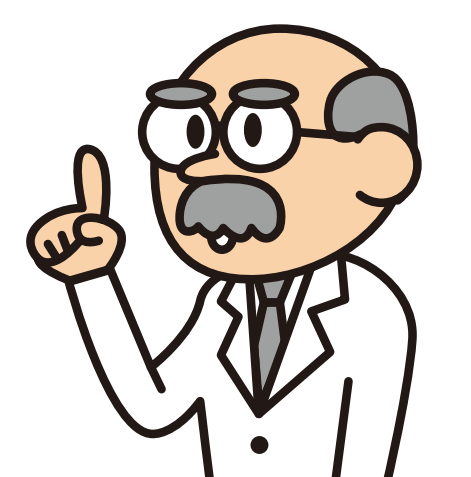
*Chikyu* is the only scientific drilling vessel equipped with a riser drilling system.



## What is drilling mud ?

Drilling mud is a mixture of mineral and chemical fluids and materials used to lubricate and cool the drill bit, and clean the borehole of cuttings. The specific gravity of drilling mud is carefully formulated to balance against anticipated formation pressure or lithology.

This control of borehole pressure allows drilling the well deeper by working to prevent borehole collapse from overburden pressure pushing into the open borehole.



## Why is drilling mud circulated ?

Pumping helps provide a balancing pressure combined with the specific gravity of the drilling mud, that not only cools the drill bit, but also cleans the borehole of the cuttings that accumulate at the bottom of the hole as the drill bit cuts rock. The drilling mud balances against the formation pressure which increases as the borehole deepens.