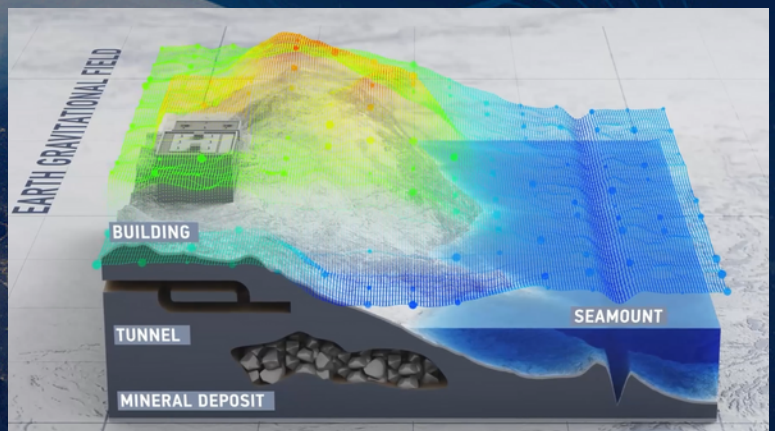


Why is it important to measure Earth gravity ?

Factsheet 3 : June 2024

As mentioned in our *factsheet 1: How can a gravimetry mission support climate change monitoring?* or in the interview of Felix Perosanz, Head of Earth Observation-Solid Space Programmes (CNES), measuring Earth gravity is an interesting tool to **improve the monitoring of climate change**. However, the possible applications of the Earth's gravity measurement are larger than monitoring climate change!

Measuring Earth gravity could be used to **locate natural resources like oil, gas, minerals, and other geological deposits**. Indeed, variations in gravity can indicate the presence of these resources and consequently **better guide exploration efforts**. According to the same principle gravity measurements can also help in **identifying underground water reservoirs and aquifers**, which are crucial for water resource management.



Graphic representation of the impact of geology on the gravitational field

Gravity measurements can also detect mass redistributions caused by tectonic movements, which might **help in understanding and potentially predicting seismic activities**. After an earthquake, gravity changes can also provide information on how the Earth's crust has deformed and adjusted, **aiding in the study of earthquake mechanics and impacts**.



Graphical representation of the improvement in the accuracy of gravity measurements made possible by the use of a quantum gravimeter

By enhancing the accuracy of gravity measurements using a quantum gravimeter, the **CARIOQA programme will significantly improve the effectiveness and applicability of gravity-based methods** discussed above. This advanced technology will **provide more precise data, supporting a wide range of scientific and commercial applications**.

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