

Geotherma = TG

@wikipedia

Synonym: Geothermal Temperature Profile = Geotherma

Natural subsurface temperature profile along the **True Vertical Direction**: $T_G(z)$, where z is **True Vertical Depth Sub-Sea (TVDss)**.

It is essentially a **true vertical** component of local **Geothermal Temperature Field** $T_G(x, y, z)$.

Many subsurface studies are focused on **Sedimentary Cover** below a specific surface area where lateral $\{x, y\}$ variation of **Geothermal Temperature Field** $T_G(x, y, z)$ maybe insignificant comparing to variation along the **true vertical direction** $\{z\}$.

This happens, for example, at the lateral scales of a typical **Petroleum Field** and allows modelling **Geothermal Temperature Field** with a laterally constant **Geothermal Temperature Profile** $T_G(z)$.

The high level overview of the **Earth's Geothermal Temperature Profile** is brought at **Fig 1**.

The zoomed picture of a typical **Geothermal Temperature Profile** in **Sedimentary Cover** of the **Earth's Crust** is brought at **Fig 2**.

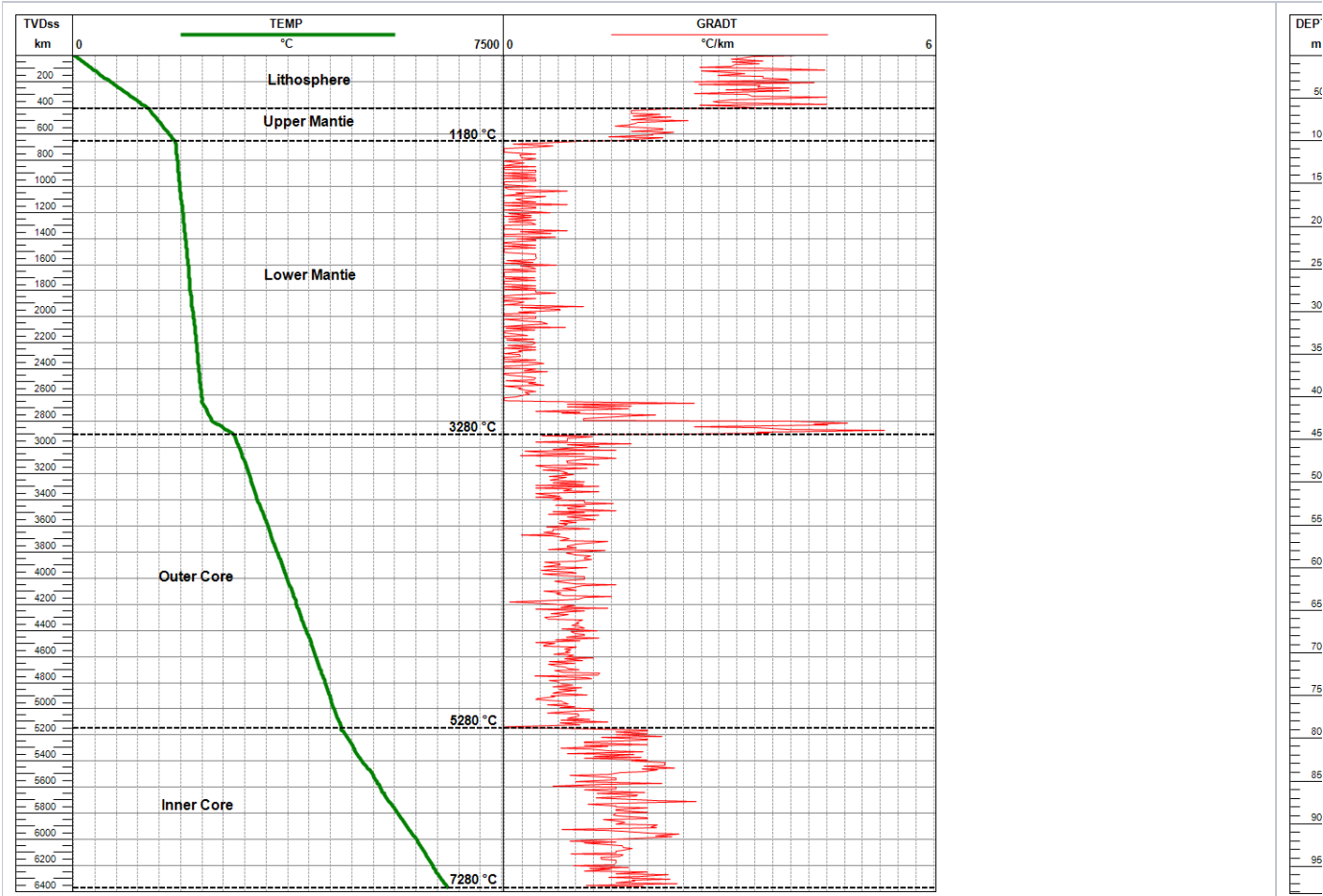


Fig. 1. Schematic picture of **Geothermal Temperature Profile** of the **Earth**.

Fig

Impact from Surface Temperature Variations

The surface temperature variations penetrate the [Sedimentary Cover](#) all the way down to the [Neutral Temperature Layer \(NTL\)](#) (see [Fig. 3](#)) which varies from few meters to few dozens of meters.

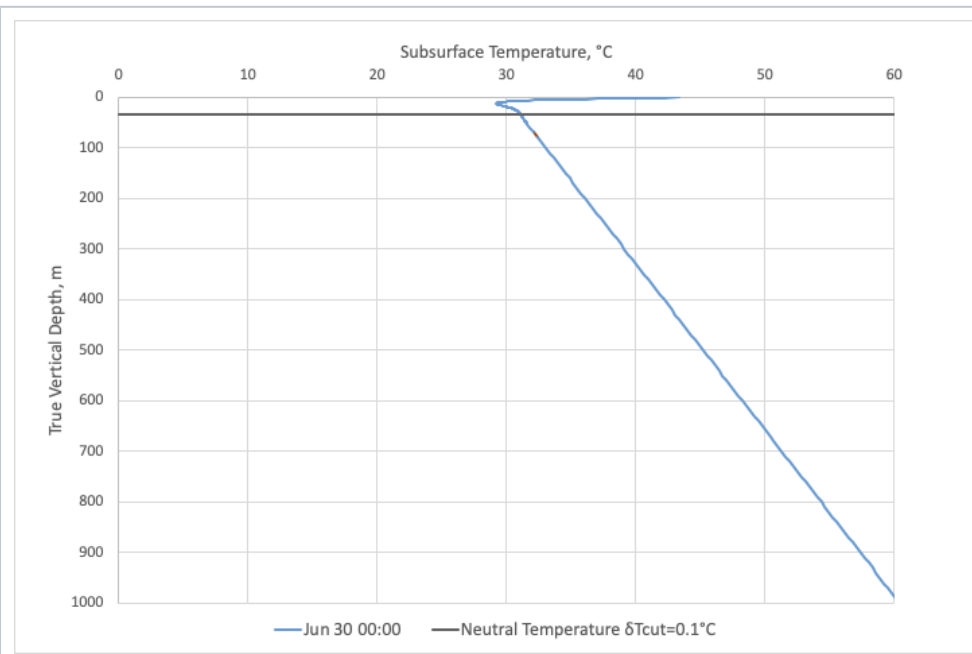


Fig. 3.1. A sample of [Geothermal Temperature Profile](#) captured at a certain time moment when surface temperature was higher than annual average.

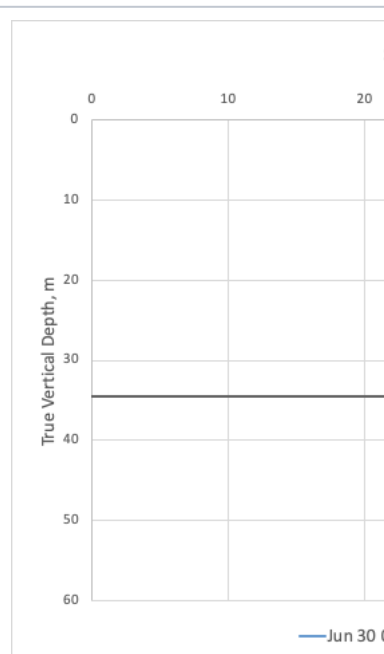


Fig. 3.2. A sample of [Geothermal temperature variations above Neutral Temperature Layer](#) captured at a certain time moment when surface temperature was higher than monthly average.

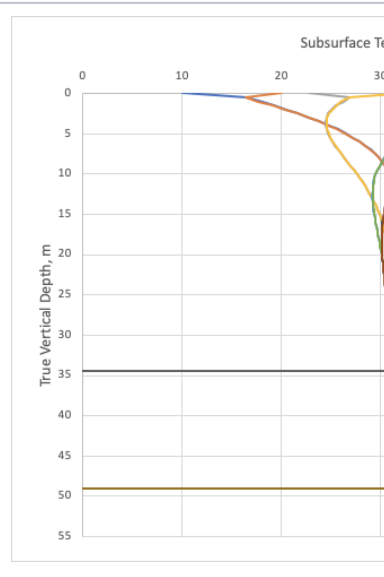
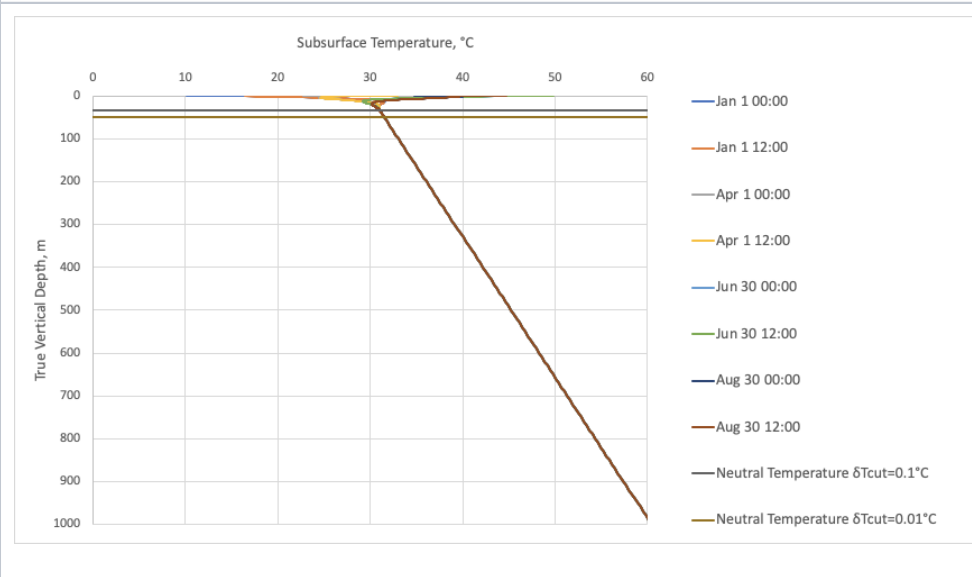


Fig. 3.3. A sample of [Geothermal Temperature Profile](#) captured at different time moments.

Fig. 3.4. A sample of [Geothermal Temperature Profile](#) moments with zoom around temperature layer

An imaginary subsurface temperature profile under assumption of the constant surface temperature $T_s(t) = \text{const}$ is called [Unbiased Geothermal Temperature Profile](#) $T_{GN}(z)$ (see **Fig. 4**).

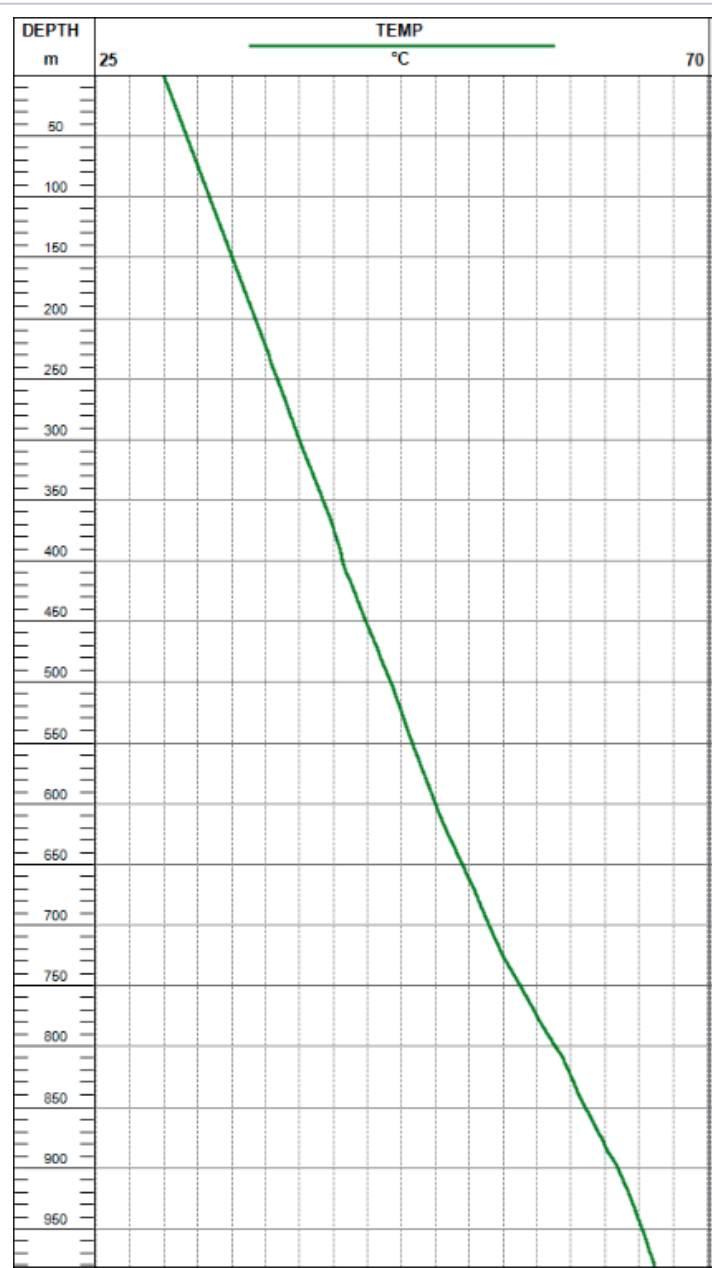


Fig. 4. A typical example of [Geothermal Temperature Profile \(TG\)](#) and [Unbiased Geothermal Temperature Profile \(TGN\)](#)

See Also

[Geology / Geothermal Temperature Field](#)

[\[Petroleum Geology \]](#) [\[Geological Model \(GM\) \]](#) [\[Neutral Temperature Layer \(NTL\) \]](#) [\[Unbiased Geothermal Temperature Profile \(TGN\) \]](#)

[\[Geothermal Temperature Profile @model \]](#)

Reference

[GeothermalTemperatureProfile.xlsx](#)