# Results from the data obtained by CTD instrument in the east southern of the Caspian Sea (Gorgan Bay- Amirabbad Port)

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**Abstract:**

The most southeastern flank of the Caspian Sea was measured for physical and chemical characteristics of the water column at 14 stations in winter 2014. The water depth varies from 2.5m to the 220m along the 81.4 km navigated transect parallel to Miankaleh Spit. The physical parameters of temperature, electrical conductivity and turbidity as well as bio-chemical properties of pH, dissolved oxygen and Chl-*a* along water column were measured using an Idronaut CTD, the property of the Iranian National Institute for Oceanography and Atmospheric Science (INIOAS).

According to the closed nature of the Caspian Sea and uniqueness of physical properties of the water body, parameters of salinity and density were recalculated by applying a correction coefficient. Based on the acquired results, the sea surface temperature increases westward from 6°C to 11.5°C from coastal shallow waters of Gomishan towards deep waters located in front of Amirabad Port in western part of the surveyed area. Accordingly, the values of electrical conductivity and sound speed belong to surface layer increase from the east to the west. Uniformity of the water column temperature is observable for the shallow waters of the eastern part of the study area, while a relatively strong temperature gradient observed in deeper waters of the western part as temperature changes from 11°C to the 7.5°C at the thermocline layer from the depth 80m to 160m. Salinity variation in both surface and bottom layers is negligible with averages of 11.84 and 11.93, respectively.

Depth value is associated with increasing values of temperature, electrical conductivity, sound speed, turbidity, pH and dissolved oxygen. Density values at the surface layer increases from 8.62 $kg/m^3$ at the western part of the surveying area to

9.55 kg/$m^3$ in eastern part, in front of the Gorgan bay inlet. At the westernmost deepest station, density goes up from 8.62 kg/$m^3$ at the surface to 12.25 kg/$m^3$ at the bottom.

pH value is approximately constant with an average value of 8.30 up to the depth of 80m. Considerable pH drop occurs at depth 80 m to 90 m from the 8.18 to 7.92. Dissolved oxygen value also is approximately constant with an average value of 10.3 ppm up to the depth of 80m. A dramatic decrease in dissolved oxygen values happens in depth of 80-100 m with 9.37 ppm absolute value and then smoothly decreases in depths of 100m to 220m and finally reaches to 6.36ppm at the depth of 220m.

Maximum variation for the Chl-*a* is 1.13 µg/l which belongs to the depths of 15 to 25 m among the whole measurement stations. The Chl-*a* value drops to 0.15 µg/l for the depths of 15 to 100m and then constantly shows the value of 0.1 µg/l for the depths below 100m.Turbidity value reduces from the east to the west and shows a higher value at shallow stations. Moreover, it is evident that turbidity value is higher for deep water than surface waters. Recorded data shows that mean values of turbidity for the both surface layers and bottom are 3.36 and 4.27 FTU, respectively with a maximum value of 14.53 at the easternmost station in front of Gorgan bay inlet.

**Keywords:**

Caspian Sea, CTD, Thermocline, Physical Oceanography