

# The isotope geochemistry of water resources in Zarivar Lake area -West of Iran

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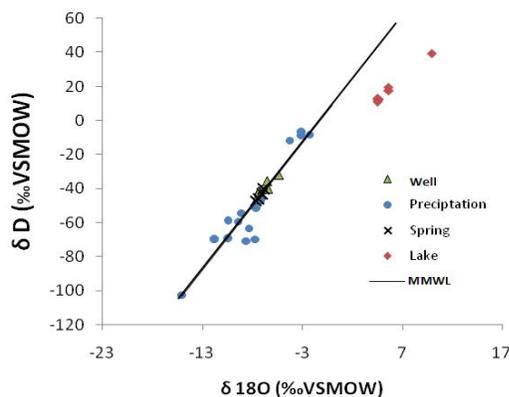


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## ABSTRACT

Lake Zerivar, with an elevation of about 1290 m above sea-level, is located in the West of Iran (35° 32'N, 46° 07'E) 3 km far from Marivan. The lake is situated in a valley between two parallel ridges within Zagros Mountains. Zarivar lake, (with 4.7 km, 2 km, and 4-5 meters, long, wide and depth, respectively) is surrounded by a belt of mire vegetation, partly forming a floating mat (van Zeist and Bottema, 1977). The total catchment area of the lake is about 290 km<sup>2</sup> (Löffler, 1961) and it covers an area of about 830 ha. The mean precipitation of the area is about 900 mm/year, falling mostly in spring and in winter time. The goals of our research are to develop Marivan meteoric water line (MMWL) for Marivan area, and to investigate the stable isotope compositions (<sup>18</sup>O, <sup>2</sup>H) of the lake water, groundwaters, and to study water geochemistry (Ca<sup>+2</sup>, Mg<sup>+2</sup>, Na<sup>+</sup>, K<sup>+</sup>, HCO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, F<sup>-</sup>, As, Pb, Cr, Zn and Hg).

Samples from precipitation and water resources (lake, springs and wells) were collected in 2010. Field parameters (T, pH, EC, and TDS) were measured during sampling period. The geochemical and isotopic analyses of water samples were performed in Geochemistry and G.G. Hatch Isotope laboratories of University of Ottawa, respectively. Figure 1 show the MMWL ( $\delta^2\text{H} = 7.47 \delta^{18}\text{O} + 9.09$ ) and isotopic composition of water resources. The  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  values of precipitation and calculated <sup>2</sup>H excess (>10‰ with average of 13.3‰), indicates the influence of the Mediterranean water masses on this area. In respect to isotopic composition of precipitation, the  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  values of the lake water samples (with average of 5.5 and 17.3‰, respectively) are more enriched than that of groundwater samples (average of -6.9 and -39.4‰, respectively), showing evaporative lost of lake water. The type of water in Marivan area is mostly bicarbonate and the concentration of measured heavy and trace elements is lower than standard levels of world health organization (WHO).



**Figure1:**  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  of water resources (lake, springs and wells) from Zarivar area. The Marivan meteoric water line (MMWL) is based on isotopic compositions of collected precipitation samples.

## Acknowledgements

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## References

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- [2] Löffler (1961). *International Review of Hydrobiology* 46, 309-406.