

TOTAL PHOSPHORUS VARIATION IN A RESTORED SOUTH MEDITERRANEAN LAGOON (NORTH LAGOON OF TUNIS)

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Abstract

The characterization of the trophic state and the water quality of the North lagoon of Tunis through phosphorus concentration was monitored in two times during early and late spring session. Different areas were identified on the basis of the water circulation in the lagoon in order to supervise its proper functioning, especially after the restoration and to characterize the ecological state of the lagoon.

Keywords: *Anoxia, Bacteria, Algerian-Tyrrhenian Trough*

The North lagoon of Tunis is one of the well-known Mediterranean lagoon in the north Africa regarding to its strategic position, biological impact on conserving sea-birds and its economic role for fishers society. This lagoon has known a critical situation due to the accumulation of urban residues and other polluted materials from the town that were thrown up directly in it. this eutrophic state has pushed the authorities in that time to set up a clearance process. Water's phosphorus concentration is one of the important indicators of the trophic state that we have controlled in the North lagoon of Tunis. Even though its basic role in the aquatic life, a high phosphorus concentration can induce to an excessive multiplication of the flora compared to the ecosystem potential and that, can indicate a serious state of eutrophication. This can induce to the decrease of the oxygen levels and even asphyxia that can affect the fishes, due to the respiration of plant biomass and their degradation by the aerobic bacteria when the plants die. We can mention here that the water levels of this nutrient has fallen in the north lagoon of Tunis thanks to the clearance process and the annual average of the phosphorus has decreased from 600µg/l to 20µg/l after the sanitation [1]. We have been able to cover 35 positions throughout the lagoon to study the variation of the phosphorus concentration. For convenience, we have started our prospectations at the opening of the "kheireddine" channel gates which are situated in the north of the lagoon, to follow the water entering quality encircling the lagoon. In early spring prospection, This nutrient is present in a heterogeneously way in the water. The values oscillated between a maximum of 65µg/l in the Southeast stations and a minimum of 4 µg/l in the Northwest stations. The average value is about 30µg/l. At a spatial scale two areas can be individualized: (1) The Northwest and Southwest part, relatively undisturbed area with good circulation of marine flows. (2) The Northeast part and Southeast where the slower currents promotes nutrient release and where there has been a fragile ecological balance.

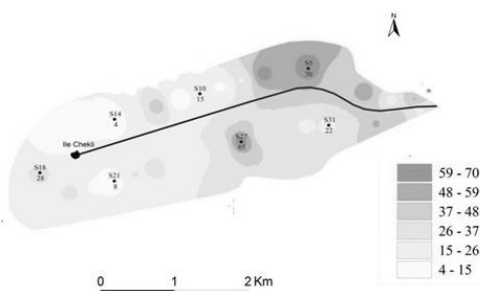


Fig. 1. Cartography of the phosphorus spatial distribution during early spring (concentration in µg/l)

In late spring prospection, there was an average total phosphorus content of about 22 µg /l. The total phosphorus content showed a decrease in May. This can be explained by the reduction of the storm water inflows in this period, also by the augmentation of the photosynthetic activity of the algae. The total phosphorus content shows fairly strong fluctuation depending on the stations. There was a maximum of about 33 µg /l at the Northwest

stations and a minimum of about 9 µg /l at the Northeast stations. The Northwest, center and the southeast are the fullest in total phosphorus which may be explained by the presence of a relatively large amount of algal biomass in these areas of the Lagoon.

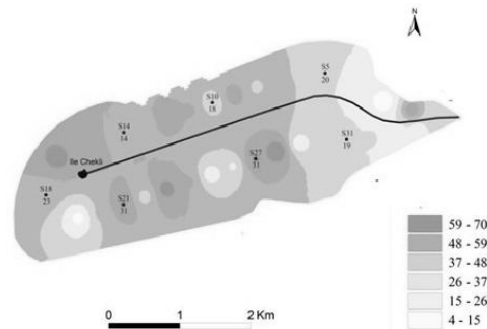


Fig. 2. Cartography of the phosphorus spatial distribution during late spring (concentration in µg/l)

The average of total phosphorus content recorded at 1993 in the north lagoon of Tunis was in the order of 19 µg /l [2]. The presence of the ell fishing nets dams at the entrance and the exit of the lagoon, which is an area of accumulation of the floating macroalgae and the decomposition may be the cause of the increase of the total phosphorus during our prospectations. The control of the evolution of physico-chemical parameters in space and time has shown an improvement of the ecosystem's balance thanks to the clearness process held in 1987, and the values of total phosphorus agree well with the marked improvement of the condition in the north lagoon of Tunis, but, this ecosystem has shown a big fragility and must remain under supervision.

References

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