

Effect of Pollution on the Hydrochemical Characteristics of Different Water Types in El-Mex Bay Area, West of Alexandria, Egypt

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El-Mex Bay, west of Alexandria, has a surface area of about 19.4 km² and volume 190.3 x 10⁶ m³. It receives a heavy load of wastewater (2.4 x 10⁹ m³/year). Seven marine trips were carried out in El-Mex Bay area during the period from January 1988 to January 1989 using a motor boat. Temperature, salinity, pH, alkalinity, dissolved oxygen, oxidizable organic matter, hydrogen sulphide, phenolic compounds and nutrients salts were measured at surface and bottom from seven sampling stations. The present work is an attempt to illustrate the extent of the influence of the polluted water on the characteristics of El-Mex Bay waters and to shed more light on the pathways of the pollutants in the Bay.

Based on the distribution of surface salinity in the investigated area, four types of water are identified :

- 1- Mediterranean Sea water (S) of salinity > 38.50‰.
- 2- Diluted sea water (D) with a salinity range from 30 to 38.50‰.
- 3- Mixed water (M) of salinity 10 to 30‰, and
- 4- Mixed land drainage (L) with a salinity of less than 10‰.

According to El-Maghraby and Halim (1965), Said (1979) and Abdel-Moati and Said (1987), the salinity value 38.50‰ was taken to represent the inner boundary of the neritic water off Alexandria. This value still could be generally accepted and will be used here to identify the limits within which the diluted sea water extends horizontally seawards. The hydrochemical characteristics of the water types referred to the mentioned above are listed in table (1). The most important features which distinguish water type "L" from other types are the low salinity, low oxygen content, high concentration of hydrogen sulphide, organic matter, alkalinity, chlorophyll *a*, nutrient salts (which is mainly present in the ammonia form) and total phenolic compounds. In contrast, water type "S" free from the effects of drainage water has high salinity values and relatively high oxygen content but low alkalinity, hydrogen sulphide, organic matter, chlorophyll *a*, and nutrient salts. The study pointed out also that water types "M" and "D" are affected to a certain extent by land drainage water which does indeed more clear in "M" water type than in "D" water type.

Table (1). Seasonal variations of the hydrochemical characteristics of average values for the different water types (L, M & D respectively).

Parameter	T	Dissolved Oxygen	Organic matter	Alkalinity	Ammonia	Nitrite	Nitrate
Month	°C	mlO ₂ L-1	mgO ₂ L-1	millieq.L-1	uM	uM	uM
January, 1988	14.20	1.79	9.94	5.40	32.20	2.52	0.08
February, 1988	14.93	1.52	7.07	4.76	40.74	1.74	2.70
April, 1988	21.07	1.70	1.46	4.36	57.66	3.87	4.41
June, 1988	27.25	0.85	2.39	2.87	7.54	0.63	0.67
August, 1988	28.41	0.81	6.66	5.62	72.20	4.87	19.50
November 1988	19.60	3.12	1.68	5.61	***	***	***
January, 1989	14.20	2.93	6.62	5.66	***	***	***
January, 1988	14.80	2.21	3.66	4.03	24.05	3.06	8.78
February, 1988	15.45	1.82	4.80	3.89	31.91	0.41	3.40
April, 1988	19.50	2.08	2.66	3.45	28.40	4.17	9.29
June, 1988	26.50	2.21	1.72	3.14	3.78	17.24	22.27
August, 1988	28.22	1.60	5.26	4.19	16.89	3.57	16.15
November 1988	22.40	3.50	3.99	4.37	***	***	***
January, 1989	14.80	3.47	5.29	3.56	***	***	***
January, 1988	15.27	2.28	4.80	2.82	4.97	0.59	0.17
February, 1988	16.00	3.37	2.40	3.23	8.83	0.77	3.58
April, 1988	19.70	2.55	1.20	3.04	12.71	2.66	17.49
June, 1988	26.28	2.00	1.94	3.40	5.46	7.62	16.71
August, 1988	---	---	---	---	---	---	---
November 1988	22.72	3.68	0.95	3.78	***	***	***
January, 1989	15.27	3.35	4.31	3.08	***	***	***

*** not sampled.

References :

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