

دراسة تأثير شحة المياه واستخدام مياه السدود والبحيرات على نوعية مياه شط الكوفة للأغراض الإروائية

2009 2007

(82%)

Abstract

There is a water shortage problem in Euphrates river , beside the water quality problem of river water , since the salinity is higher than its average . In this study attempt to relate between the problem of water quality and the river discharge decrease in addition to the effect of using the storage water in the lakes of dams on the water quality .

Samples of water from two different stations along Kufa river were tested and analysis monthly for three years (2007 to 2009) . Five variables were analysis for total dissolved solids (TDS) , electrical conductivity (Ec) , sodium (Na) , calcium (Ca) and magnesium (Mg) .

Results shows that decreasing the river discharge and uses of lake water causes to increasing the salinity of water about (82%) . While there is no effect of the sodium hazard .

The quality of water for Kufa river for irrigational uses was ranging between high to medium salinity and it can be concenter is permissible water , and it is safe water as sodicity hazard .

()

(E11)

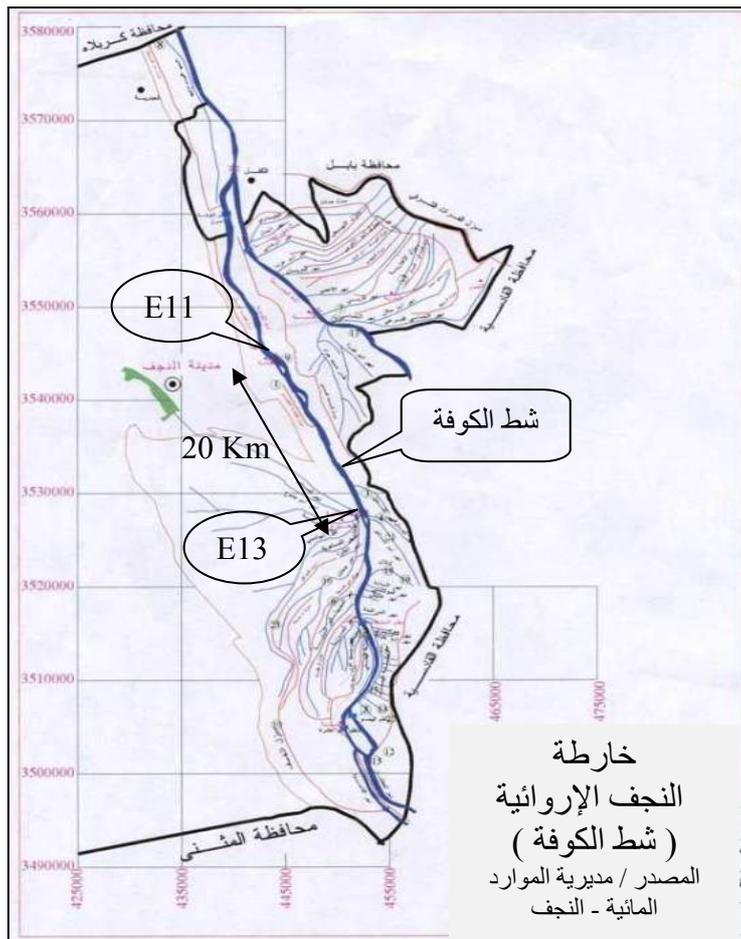
(E13)

(1) 20 Km

(Ca⁺⁺) (Na⁺) (Ec) (TDS)

(K⁺) (Mg⁺⁺)

(Sodicity Hazard) (Salinity)



(1)

: Salinity : "

(TDS)

(TDS)

) (1948 , Wilcox) (1936 , Schofield) (Ec)

. (1945 , Richards) (1954 , Thorne & Peterson

(1))

)

, Todd)

(1972 , Taylor & Ashcroft

(2003 , Fibbs) (1980

: Sodicity Hazard : "

(Dispersed)

Soluble Sodium Percentage (SSP) - 1

$$SSP = [Na / (Ca + Mg + Na + K)] \times 100$$

(1)		
(TDS mg/l)	(Ec μ mhos/cm)	
160-0	250-0	C1
480-160	750-250	C2
1440-480	2250-750	C3
3200-1440	5000-2250	C4
(Taylor & Ashcroft , 1972)		
(TDS mg/l)	(Ec μ mhos/cm)	
480 >	750 >	A
960-480	1500-750	B
1920-960	3000-1500	C
1920 <	3000 <	D
(Fipps , 2003) / (Todd , 1980)		
(TDS mg/l)	(Ec μ mhos/cm)	
175 >	250 >	- 1
525-175	750-250	- 2
1400-525	2000-750	- 3
2100-1400	3000-2000	- 4
2100 <	3000 <	- 5

Sodium Adsorption Ratio (SAR) _____ - 2

$$SAR = Na / \sqrt{[(Ca + Mg) / 2]}$$

Exchangeable Sodium Percentage (ESP) _____ -3

$$ESP = 100 \times (-0.0126 + 0.01475 \times SAR) / [1 + (-0.0126 + 0.01475 \times SAR)]$$

(SAR)

(2)

(SAR)

(Ec)

(2)

(Todd , 1980)

(Fipps,2003)

SAR

(SAR)

(3)

)

(SAR)

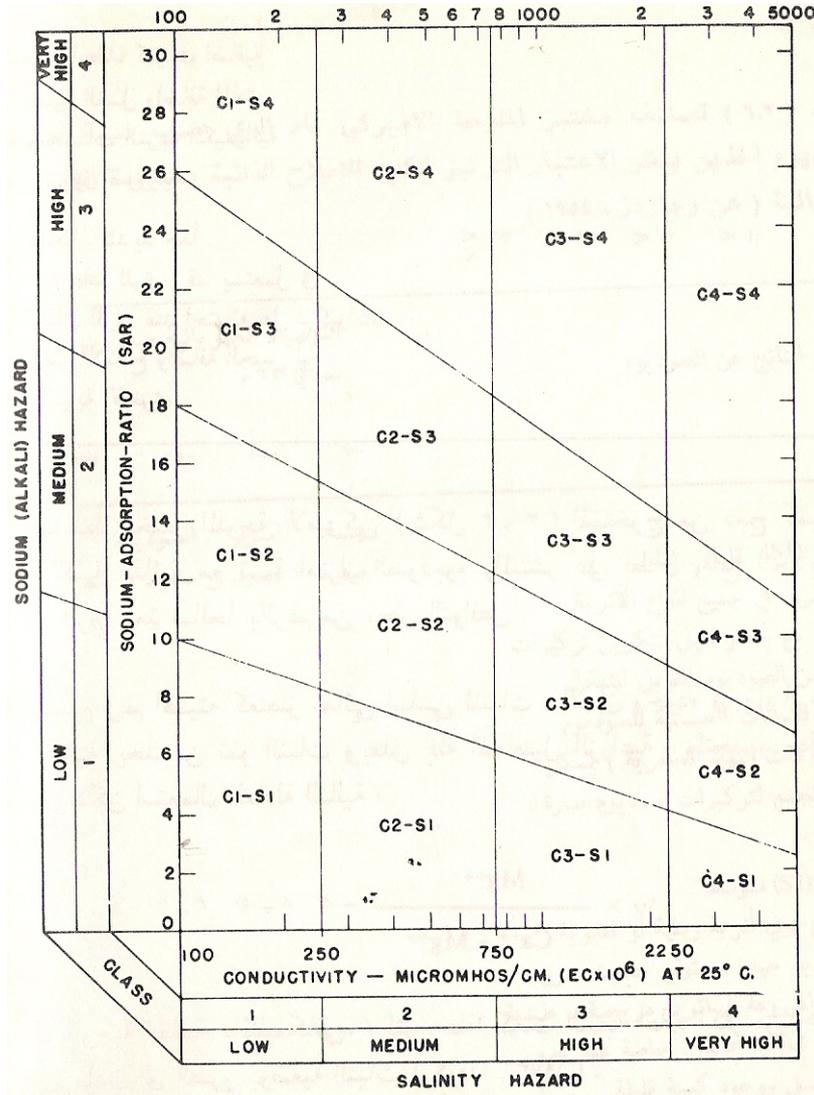
(Ec)

(Mg)

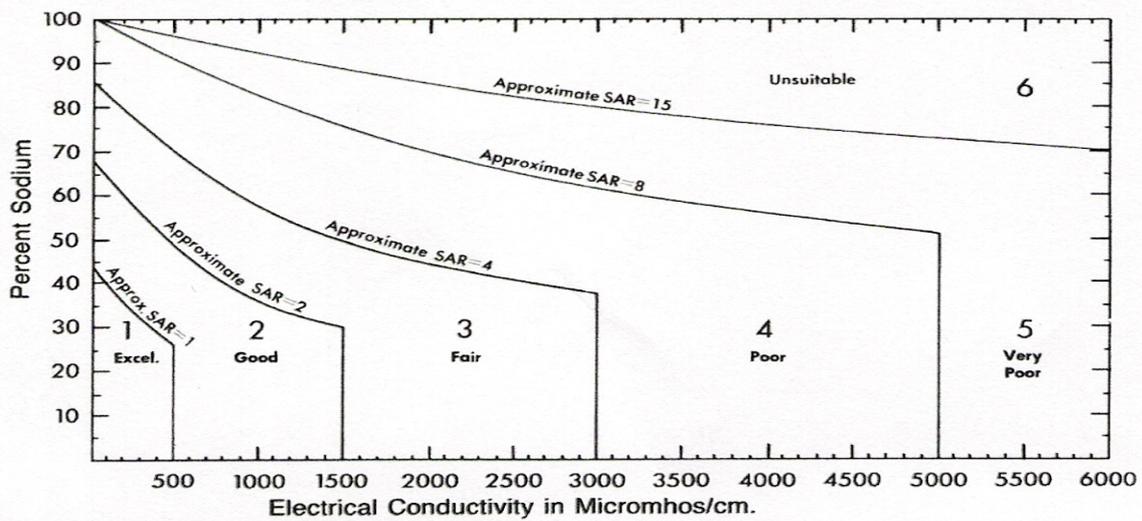
(Ca)

(Na%

(2)				
(Ec μ hos/cm)				
2250<	2250-750	750-250	250-100	
(SAR)				
4 - 0	6 - 0	8 - 0	10 - 0	S1
9 - 4	12 - 16	15 - 8	18 - 10	S2
14 - 9	18 - 12	22 - 15	26 - 18	S3
14 <	18 <	22 <	26 <	S4
(Todd , 1980)				
(SAR)				
20 >				- 1
40 - 20				- 2
60 - 40				- 3
80 - 60				- 4
80 <				- 5
(Fipps , 2003)				
(SAR)				
10 - 1				- 1
18 - 10				- 2
26 - 18				- 3
26 <				- 4



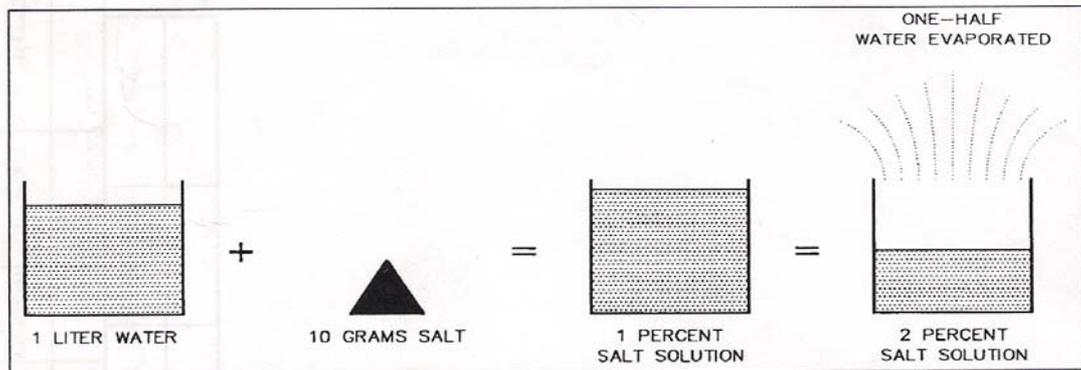
(2)



(3)

(120m³/sec) (2007) (2009) (84 m³/sec) (2008) (m³/sec) (6) (30%) (2007) (2008) (60%) (5) (3)

(3) (2009) (36%) (2008) (31%) (2007) (22%) (4)



(Guy Fipps , 2003)

(4)

Salinity :

(Ec) (TDS)

(7)

(3)

(735 mg/l) 2008

(662 mg/l) 2007

مجلة جامعة بابل / العلوم الهندسية / العدد (١) / المجلد (٢٠) : ٢٠١٢

(2007) (1204 mg/l) (2009) (11%)
 (Ec) (8) (82%)
 (1325 μ hos/cm) (2008 2007) (3)
 . (35%) (1783 μ hos/cm) (2009)
 (2009)

) (2007) (Ec TDS)
 (2008) (TDS) (2009 ,
 -) (2009 ,) (35%)
) (18%) (2008) (Ec) (2009 ,

()

(3)				
2009	2008	2007		
48	84	120	84	
307	431	579	435	
418	564	706	562	
1204	735	662	869	TDS mg/l
1783	1325	1325	1465	Ec μohs/cm
185	143	105	145	Na mg/l
155	71.5	64	96	Ca mg/l
61	67	68	65	Mg mg/l
4.48	4.23	3.1	3.95	SAR
46	51	44	47	Na %

(2008 2007) (- B)
 (2009) (- C)
 ()
: Sodicity Hazard : "
 (SAR)
 (12) (11,10,9)
 () (3) (3.95)
 () ()
: "
 (Ec) (2)
 (SAR)
 () (C3 - S1)
 () ()
 (8) (Ec) (3)
 (SAR) (13) (Na%)
 (3) () (12)
 () ()
 (2009 2008) () (2007)
 ()

-1
 -2
 -3
 -4
 -5

-1

-2

-3

-4

" 1988

" 2009

/

. B

" 2009

"

. C /

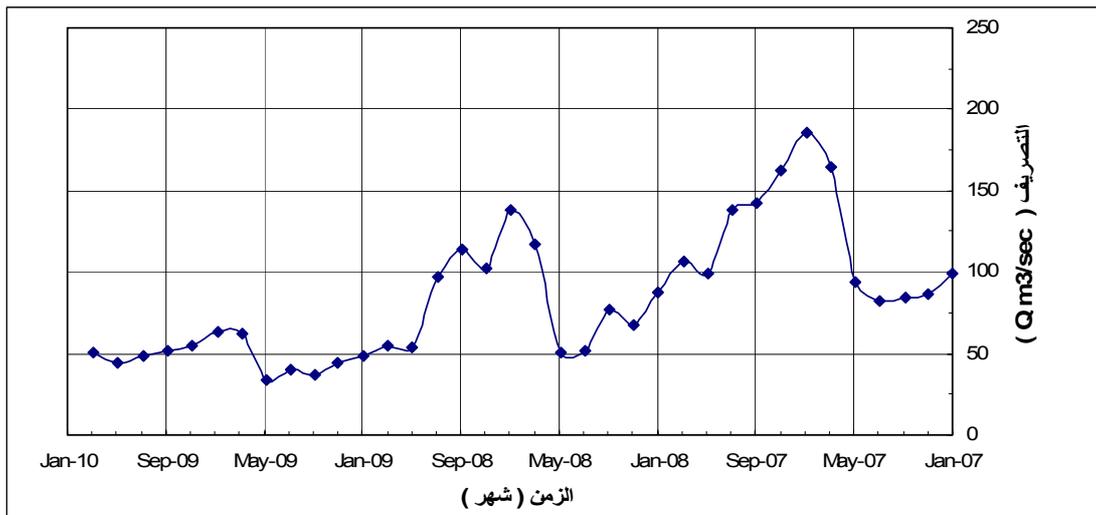
Guy Fipps , 2003 , " *Irrigation Water Quality Standards and Salinity Management Strategies* " Department of Agricultural Engineering , The Texas A&M University System , College Station , Texas .

Johnson , J. and Zhang , H. 2003," *Classification of Irrigation Water Quality* " Division of Agricultural Sciences and Natural Resources , OSU , Oklahoma .

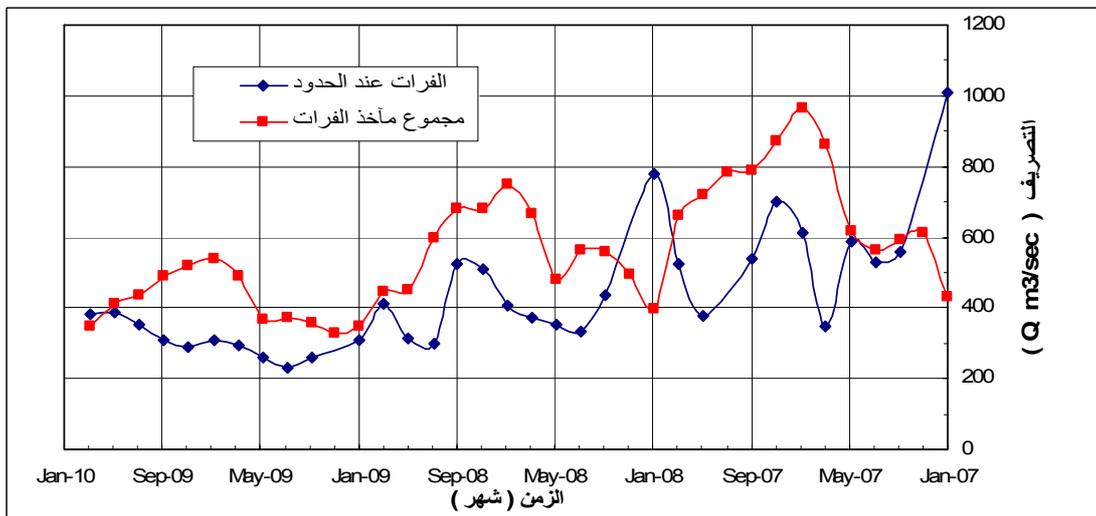
Richards , L. A. (ed) , 1954 , " *Diagnosis and Improvement of Saline and Alkali Soils* " US Dept. Agri. Handbook No. 6 .

Taylor , S. A. and G. L. Ashcroft , 1972 , " *Physical Edaphology* " W. H. Freeman and Co. , San Francisco .

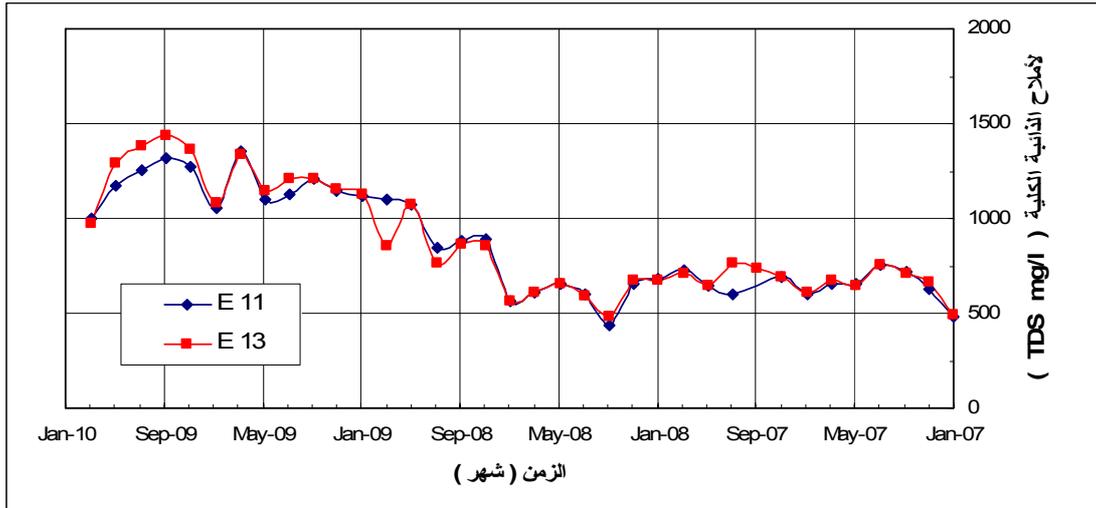
Todd , D. , 1980 , " *Groundwater Hydrology* " Second Edition , John Wiley and Sons Inc. , N. Y.



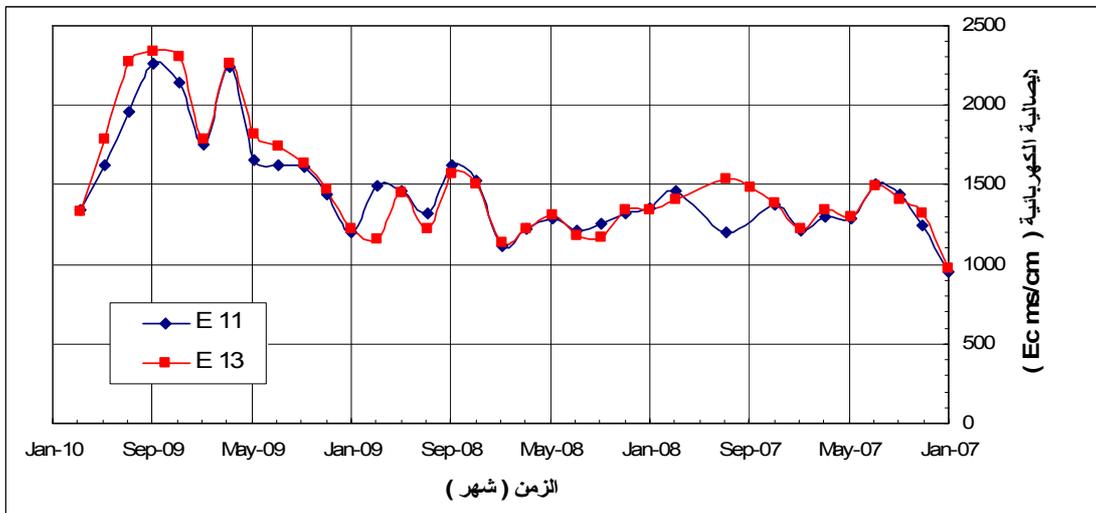
(5)



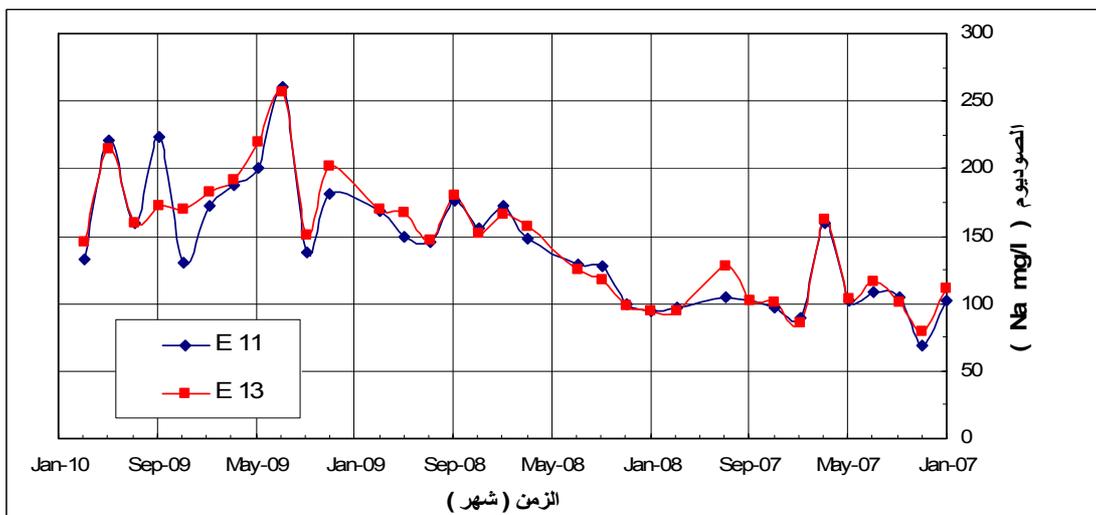
(6)



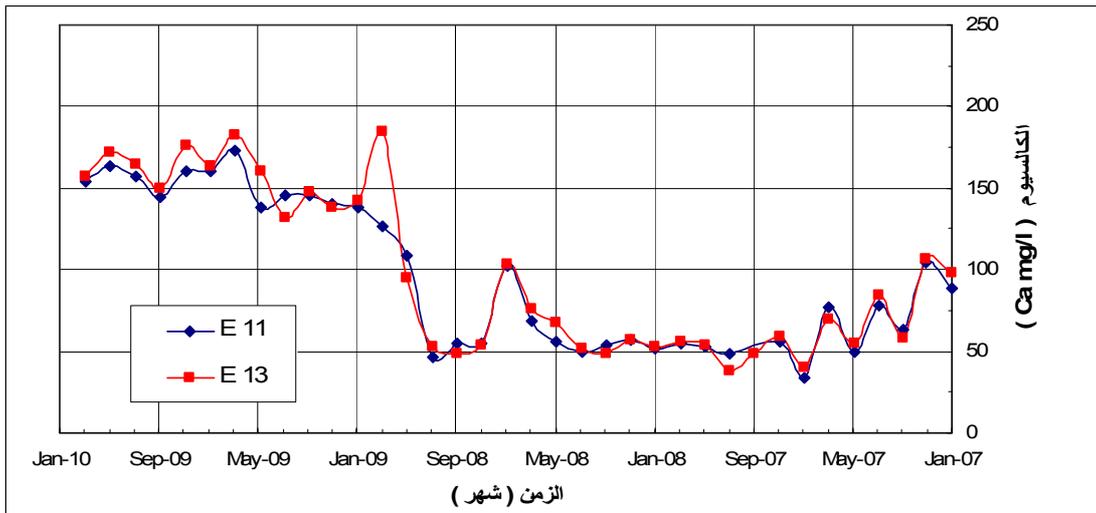
(7)



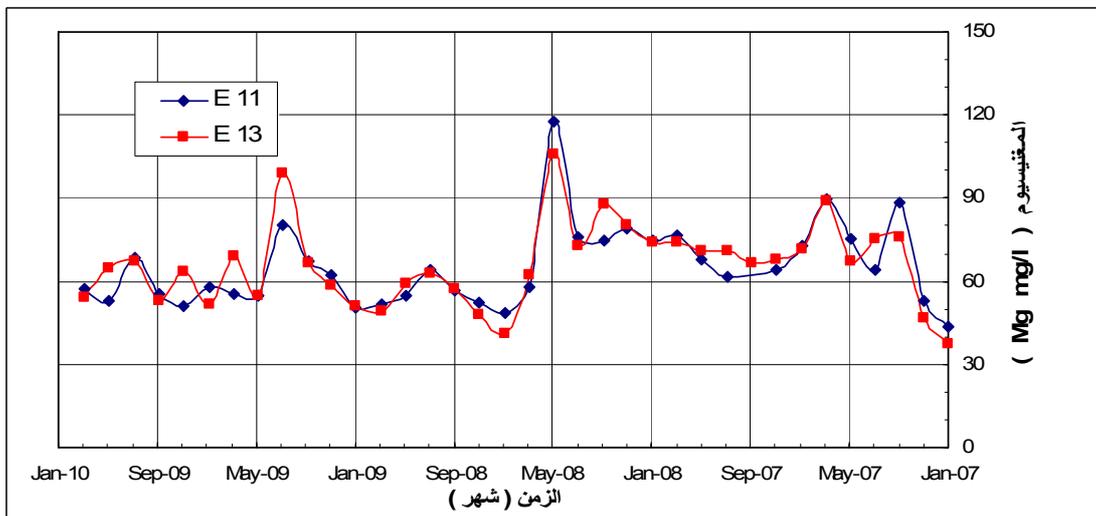
(8)



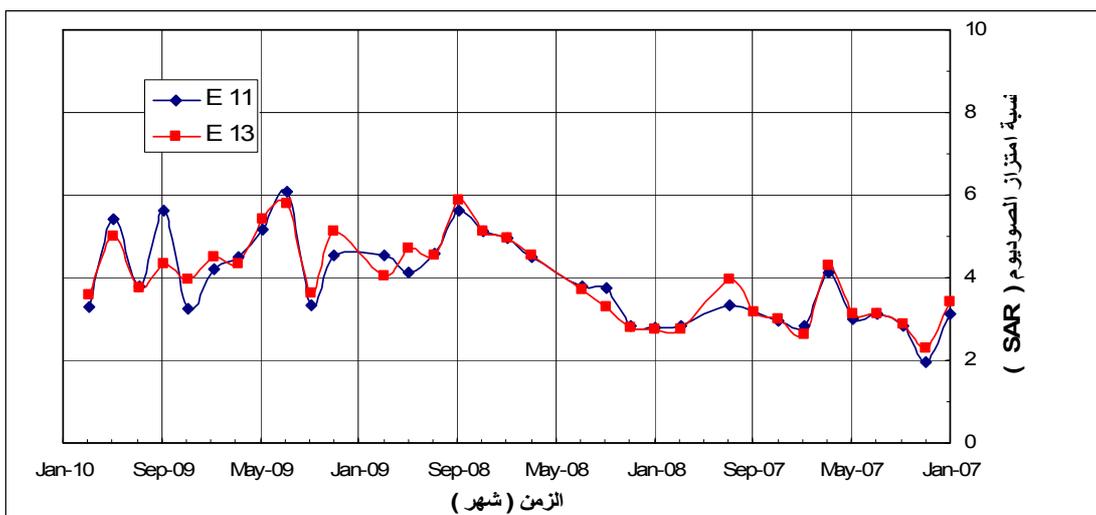
(9)



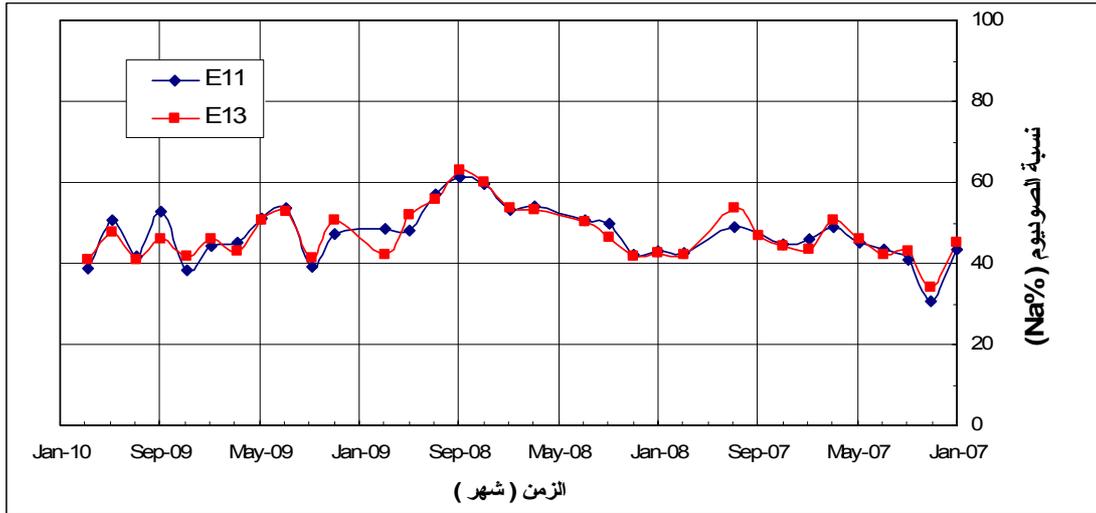
(Ca⁺⁺) (10)



(Mg⁺⁺) (11)



(SAR) (12)



(13)