

# Supplementary Materials

## Supplementary Table:

**Table S1.** Results of the physico-chemical parameters of all campaign (2017. 2018. 2019. and 2020) in the coastal zone of Essaouira basin in the Hauterivian aquifer.

Sample	H	pH	T	EC	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>	HCO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	WQI	IWQI	BI
			°C	μS/cm	mg/L										%
Campaign 2017															
191/51	-	7.2	24	1661	128.3	65.6	108.1	3.9	506.5	326.1	100.9	18.6	109.6	56.3	-9
P9	-	7.4	24.3	1685	122.2	89.9	112.7	7.8	457.7	340.3	163.4	12.4	111.1	56.7	-5
163/51	154.4	7.2	23.3	1165	106.2	70.5	75.9	7.8	335.6	141.8	249.8	6.2	86.5	71.5	-1
HT24	117.4	7.9	19.4	1641	118.2	99.7	131.0	7.8	414.9	397.0	197.0	6.2	110.4	51.7	-5
HT25	-	6.9	24	1787	122.2	91.2	117.2	7.8	494.3	368.7	120.1	12.4	113.7	33.0	-6
HT26	-	7.2	24.8	1681	128.3	80.2	108.1	7.8	408.8	382.9	148.9	6.2	105.9	47.2	-7
HT27	146.1	7.1	22.1	1518	132.3	94.8	96.6	7.8	445.4	326.1	120.1	12.4	105.6	59.1	-1
HT28	-	7.2	24.6	1751	114.2	105.7	119.5	11.7	482.1	354.5	187.4	12.4	117.4	45.2	-5
HT29	-	8.4	23	1134	136.3	59.6	50.6	7.8	244.1	127.6	345.9	6.2	85.9	77.5	-3
HT101	123.1	7.8	21.3	2130	144.3	178.7	133.3	7.8	506.5	425.4	514.1	6.2	145.8	40.9	-5
HT102	148.4	7.2	21.5	1509	124.2	74.1	112.7	7.8	469.9	354.5	139.3	6.2	105.9	46.7	-9
HT103	-	7	22.9	1554	112.2	71.7	110.4	7.8	518.7	312.0	115.3	12.4	108.0	55.8	-9
HT104	-	6.9	22.9	2203	158.3	92.4	216.1	7.8	506.5	638.1	57.7	18.6	134.4	26.5	-5
	Min	6.9	19.4	1134	106.2	59.6	50.6	3.9	244.1	127.6	57.7	6.2	85.9	26.5	-9
	Max	8.4	24.8	2203	158.3	178.7	216.1	11.7	518.7	638.1	514.1	18.6	145.8	77.5	-1
	Moy	7.3	22.9	1647.6154	126.7	90.3	114.8	7.8	445.4	345.8	189.2	10.5	110.8	51.4	-5.4
Campaign 2018															
163/51	153.4	7.3	22.1	1221	118.6	60.3	54.7	5.7	323.4	113.6	227.7	4.1	79.6	74.7	0.0

Sample	H	pH	T	EC	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>	HCO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	WQI	IWQI	BI
			°C	μS/cm	mg/L										%
P9	-	7.4	23.9	1787	121.8	81.6	110.9	4.5	445.4	326.6	139.2	6.0	101.5	56.9	-5.0
HT24	117.5	8	18.3	1754	115.4	81.6	96.2	6.4	427.1	255.6	166.2	7.4	99.8	59.5	-3.0
HT25	-	7.1	24	1991	153.9	89.4	102.1	5.2	549.1	411.8	114.6	10.7	117.1	35.8	-8.0
HT26	-	7.3	24.3	1803	157.1	66.1	105.0	3.4	390.5	340.8	144.1	5.0	99.1	58.2	-3.0
HT28	-	7.2	23.6	1897	117.0	96.2	116.9	8.4	475.9	340.8	171.1	10.0	110.4	55.2	-5.0
HT29	-	8.1	18.1	1094	120.2	61.2	57.7	4.9	225.8	127.8	259.7	4.0	76.1	77.3	3.0
HT102	148.5	7.2	21.6	1754	147.5	77.8	96.2	2.9	512.5	326.6	97.4	9.3	105.3	56.9	-5.0
HT115	326.8	7.7	22.1	1461	89.8	87.5	84.3	9.0	494.2	213.0	109.7	14.8	98.4	62.9	-3.0
HT116	264.3	7.9	22.1	3688	246.9	186.6	196.7	4.4	500.3	894.6	340.8	11.5	176.8	20.0	-6.0
HT117	278.8	7.7	22.6	1131	51.3	89.4	75.4	5.6	506.4	127.8	53.1	15.3	85.3	68.5	0.0
HT118	259.8	8.1	21.6	668	62.5	20.4	45.0	5.1	207.5	127.8	38.4	2.3	50.0	81.8	-6.0
HT119	276.4	8.3	21.6	3270											-
HT120	175.2	7.1	21.1	1731	145.9	82.6	54.7	2.7	469.8	326.6	114.6	10.7	101.9	62.2	-8.0
	<b>Min</b>	7.1	18.1	668	51.3	20.4	45.0	2.7	207.5	113.6	38.4	2.3	50.0	20.0	-8.0
	<b>Max</b>	8.3	24.3	3688	246.9	186.6	196.7	9.0	549.1	894.6	340.8	15.3	176.8	81.8	3.0
	<b>Moy</b>	7.6	21.9285714	1803.57143	126.8	83.1	92.0	5.3	425.2	302.6	152.0	8.5	100.1	59.2	-3.8
Campaign 2019															
163/52	153.5	7.3	22	1350	114.2	64.4	57.5	7.8	335.6	120.5	235.4	6.2	84.8	73.0	-1.0
P9	-	7.4	24	1735	180.4	89.9	103.5	3.9	573.6	411.2	177.8	6.2	120.1	36.2	-8.0
HT24	117.4	7.9	18	1799	148.3	88.7	105.8	15.6	488.2	287.1	182.6	6.2	114.5	56.3	-1.0
HT25	-	7.2	23.5	1836	180.4	58.3	110.4	11.7	610.2	255.2	110.5	12.4	119.3	47.2	-2.0
HT26	-	7.4	24.6	1708	176.4	85.1	115.0	3.9	610.2	382.9	187.4	6.2	121.6	35.3	-8.0
HT28	-	7.3	24.8	1749	190.4	89.9	101.2	7.8	524.8	382.9	230.6	12.4	122.5	37.8	-6.0
HT29	-	8.1	21.4	1130	148.3	89.9	27.6	7.8	244.1	170.2	374.8	6.2	88.0	64.6	-2.0
HT102	148.4	7.2	21.9	1601	180.4	99.7	98.9	7.8	659.0	411.2	96.1	12.4	124.8	35.7	-6.0

Sample	H	pH	T	EC	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>	HCO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	WQI	IWQI	BI
			°C	μS/cm	mg/L										%
HT115	325.7	7.5	22.8	2405	176.4	109.4	48.3	3.9	512.6	351.0	245.0	18.6	128.2	59.6	-8.0
HT117	277.2	7.7	22.8	1113	106.2	59.6	69.0	7.8	549.2	148.9	72.1	12.4	93.0	60.2	-6.0
HT118	257.5	8.2	21.9	687	82.2	38.9	55.2	3.9	280.7	205.6	43.2	0.0	60.4	75.9	-7.0
HT120	174.6	7.1	21.7	1589	180.4	96.0	64.4	3.9	598.0	354.5	158.5	6.2	116.1	41.1	-8.0
	<b>Min</b>	7.1	18	687	82.2	38.9	27.6	3.9	244.1	120.5	43.2	0.0	60.4		-8.0
	<b>Max</b>	8.2	24.8	2405	190.4	109.4	115.0	15.6	659.0	411.2	374.8	18.6	128.2		-1.0
	<b>Moy</b>	7.525	22.45	1558.5	155.3	80.8	79.7	7.2	498.8	290.1	176.2	8.8	107.8		-5.3
Campaign 2020															
HT123	-	7.3	23	2993	192.3	125.0	263.8	3.3	414.8	657.5	343.0	72.1	167.9	22.7	-3.0
HT55	36.7	7.6	22.1	2505	168.7	46.4	301.6	2.1	302.6	661.7	87.3	40.0	126.8	22.4	-1.0
HT54	62.4	7.5	22.3	1891	96.8	63.1	203.6	1.5	407.5	378.0	199.0	27.3	110.5	42.1	-7.0
HT56	0.8	7.2	21.5	5285	340.4	84.3	614.3	214.6	429.4	1090.3	237.6	940.5	600.0		-2.0
E70	0.93	7.1	22.4	1407	141.9	46.3	100.0	5.3	353.8	207.7	116.0	14.5	87.9	65.1	4.0
E71	89.5	7.7	22.2	4094	128.3	58.9	682.6	24.2	280.6	1079.9	218.0	226.8	243.0		-2.0
E72	46	7.6	24.5	2224	159.8	67.0	197.9	5.4	407.5	438.9	246.4	5.5	118.8	41.1	-4.0
E73	47	7.4	29.2	2340	144.8	70.2	210.6	4.8	409.9	487.2	213.6	0.3	117.7	31.2	-6.0
E74	4	8.5	27	27000	341.1	817.5	7117.6	231.0	178.1	11574.5	2320.0	3.5	1244.1		3.0
E75	2.5	6.6	24.1	1981	125.7	59.6	168.0	6.4	341.6	344.4	175.0	0.8	98.3	57.8	-1.0
E76	250	8.05	27.7	1862	92.2	25.6	219.0	2.5	214.7	375.5	196.8	53.5	103.5	36.8	-8.0
HT120	174.4	7.2	25	1541	151.1	58.9	90.5	3.6	419.7	247.5	142.5	8.5	95.4	62.4	-2.0
HT26	135	7.2	25	1579	127.2	60.1	102.8	3.4	444.1	248.9	147.8	3.4	94.7	59.4	-5.0
P9	143	7.3	25.7	1635	130.5	71.3	112.9	4.4	424.6	251.9	128.8	4.6	95.5	58.7	2.0
HT102	148.1	7.5	24	1551	139.2	59.3	111.1	3.1	475.8	243.5	149.8	12.3	100.7	59.6	-4.0
HT25	148	7.4	26.5	1812	168.6	75.6	138.0	5.7	505.1	324.5	180.7	15.3	116.2	59.9	-2.0
HT24	117	8.2	25	1837	104.5	84.7	148.5	8.4	510.0	324.0	194.1	0.2	111.1	57.8	-7.0

Sample	H	pH	T	EC	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>	HCO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	WQI	IWQI	BI
			°C	μS/cm	mg/L										%
E83	163	8.12	32	867	60.7	32.9	39.4	5.1	200.1	51.7	180.4	0.3	55.9	69.3	-6.0
163/52	155.1	-	-	-	-	-	-	-	-	-	-	-			-
HT29	195	8.2	24	1050	106.2	41.3	39.2	5.0	231.8	52.3	245.4	0.3	67.5	67.3	1.0
HT115	324.8	7.9	24	1896	96.6	95.7	166.3	9.9	475.8	314.7	155.2	6.0	109.8	56.4	0.0
HT117	275.2	7.7	24.3	1161	108.5	62.9	81.6	2.8	507.5	106.2	90.8	14.8	94.5	68.4	3.0
HT118	261.35	8.1	24	481	81.9	36.6	59.9	4.3	265.5	215.0	66.0	2.8	59.1	76.5	-9.0
	<b>Min</b>	6.6	21.5	481	60.7	25.6	39.2	1.5	178.1	51.7	66.0	0.2	55.9	22.4	-9.0
	<b>Max</b>	8.5	32	27000	341.1	817.5	7117.6	231.0	510.0	11574.5	2320.0	940.5	1244.1	76.5	4.0
	<b>Moy</b>	7.6	24.8	3136	145.8	97.4	507.7	25.3	372.7	894.4	274.3	66.1	182.7	53.4	-2.5