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Supplementary material

Multiple Evidence for Climate Patterns Influencing Ecosystem Productivity across Spatial Gradients in the Venice Lagoon

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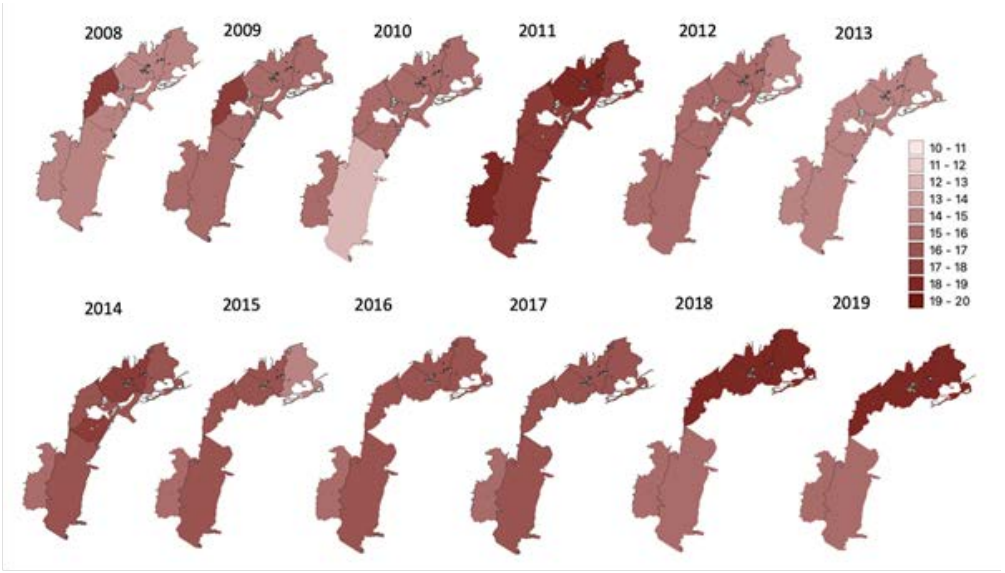
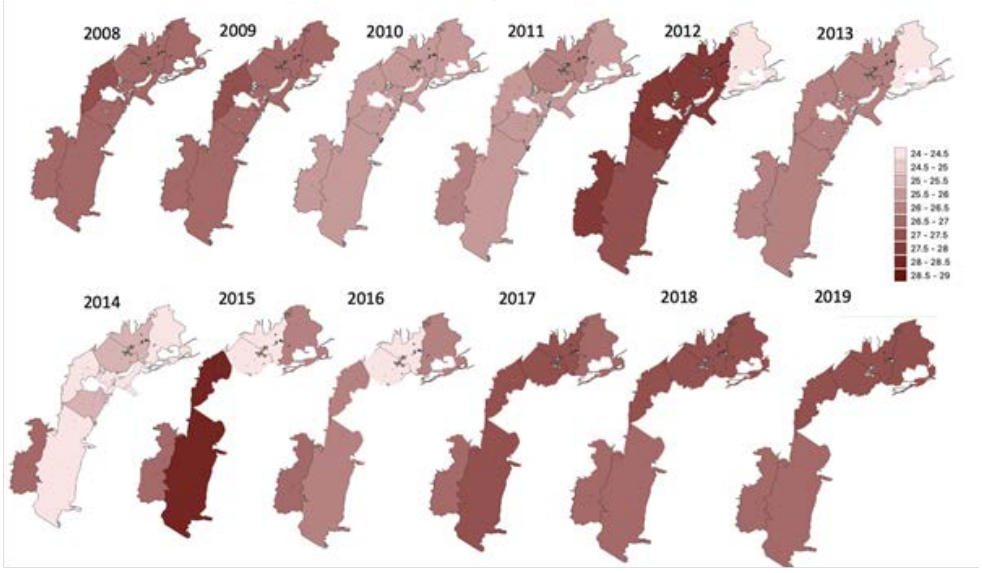


a)



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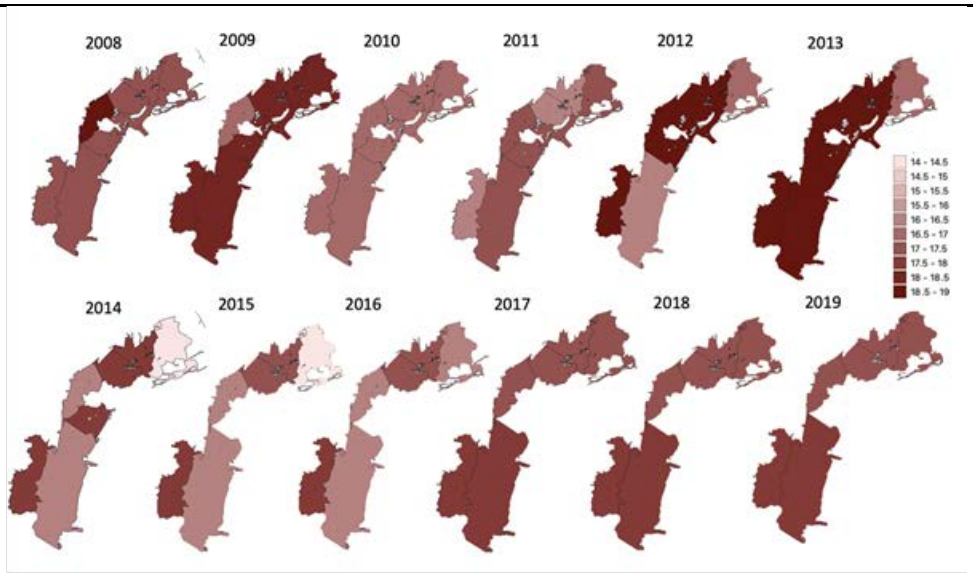

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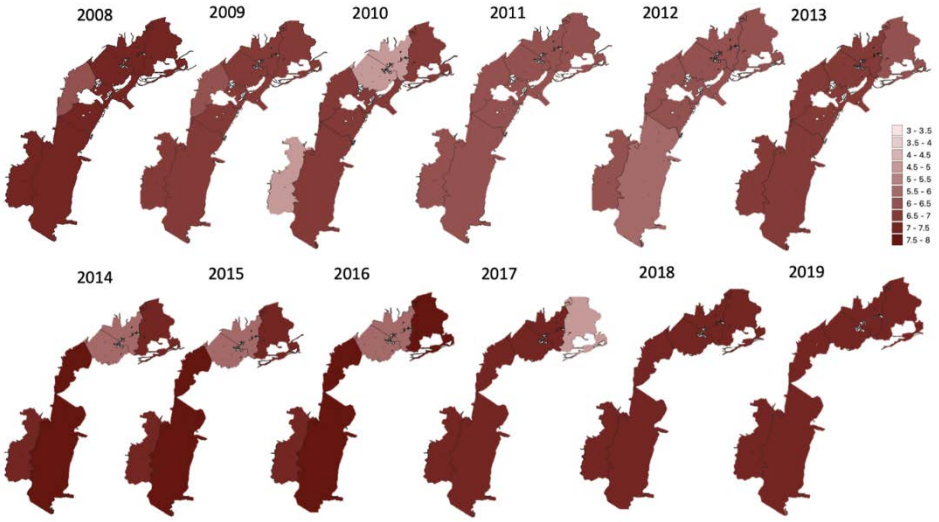

d)

S1 Maps of the Venice lagoon in a) spring, b) summer, c) autumn, d) winter, showing the k-mean temperature in each sub-basin. .

S2 Table with oxygen values (mean, standard deviation, minimum and maximum recorded) for each year and sub-basin. .

Sub-basin	**year**	**Oxygen mg/l (mean** ± sd)	**Oxygen mg/l (min)**	**Oxygen mg/l (max)**
EC	2008	11.2± 2.1	4.8	27.9
	2009	11.3 ± 1.9	2.2	21.1
	2010	10.9 ± 2.1	7.4	22.3
	2011	9.6 ± 1.8	4.6	19.4
	2012	9.4 ± 2.4	4.2	22.7
	2013	10.9 ± 1.9	7.5	22.5

Sub-basin	year	Oxygen mg/l (mean ± sd)	Oxygen mg/l (min)	Oxygen mg/l (max)
	2014	9.5 ± 2.4	5.8	23.7
	2015	9.1 ± 2.8	0.02	18.6
	2016	11.1 ± 2.4	6.2	19.4
	2017	9.4 ± 1.7	2.4	19.6
	2018	10.8 ± 2.5	4.7	19.7
ENC1	2008	11.9 ± 2.7	4.7	28.4
	2009	12.1 ± 2.7	4.6	24.4
	2010	11.1 ± 2.4	6.2	21.7
	2011	11.7 ± 2.9	1.4	28.3
	2012	11.7 ± 3.2	0.9	24.9
	2013	12.1 ± 3.7	4.1	25.1
	2014	12.1 ± 2.9	3.5	24.9
	2015	11.3 ± 3.4	0.1	27.4
	2016	11.3 ± 2.4	4.5	20.9
	2017	10.8 ± 2.6	4.7	21.7
	2018	10 ± 2.7	2.9	19.3
ENC2	2008	10.8 ± 1.8	4.9	19.9
	2009	10.7 ± 1.7	4.7	18.3
	2010	10.5 ± 1.4	5.8	20.1
	2011	11.3 ± 1.8	0.7	20.4
	2012	11.1 ± 1.8	6.1	22.1
	2013	11.3 ± 2.4	2.7	33.5
	2014	12.3 ± 1.7	2.7	18.9
ENC4	2008	12.3 ± 3.1	1.5	29.9
	2009	12.2 ± 2.8	4.2	27.1
	2010	11.7 ± 2.4	7.2	22.5
	2011	12.4 ± 2.8	6.2	26.1

Sub-basin	**year**	**Oxygen mg/l (mean** ± sd)	**Oxygen mg/l (min)**	**Oxygen mg/l (max)**
	2012	11.6 ± 3.1	1.6	24.7
	2013	12.4 ± 3.3	4.7	28.9
	2014	12.1 ± 2.9	3.1	25.5
PC2	2008	10.5 ± 2.1	1.9	23.9
	2009	11.1 ± 2.2	3.4	21.2
	2010	10.8 ± 2.1	4.8	22.9
	2011	11.0 ± 2.1	1.8	21.8
	2012	11.1 ± 2.3	5.7	27.3
PNC1	2008	11.3 ± 2.9	4.7	31.5
	2009	11.6 ± 2.6	5.5	25.9
	2010	11.1 ± 2.4	5.5	25.1
	2011	11.8 ± 3.1	4.5	36.7
	2012	12.2 ± 4.1	2.6	34.3
	2013	10.9 ± 3.8	0.2	38.7
	2014	10.9 ± 3.1	1.8	28.7
	2015	11.7 ± 3.3	3.4	31.2
	2016	11.6 ± 3.1	0.2	32.3
	2017	11.0 ± 2.7	1.6	26.5
	2018	10.5 ± 5.1	0.1	39.7
PNC2PC1	2008	9.7 ± 2.3	1.8	26.2
	2009	11.1 ± 2.8	3.9	30.2
	2010	9.0 ± 2.0	3.8	19.5
	2011	10.7 ± 2.5	3.0	28.8
	2012	12.4 ± 5.9	2.1	43.7
	2013	12.6 ± 4.8	0.01	31.1
	2014	9.2 ± 3.8	0.01	34.7
	2015	10.0 ±3.5	0.2	26.2

Sub-basin	year	Oxygen mg/l (mean ± sd)	Oxygen mg/l (min)	Oxygen mg/l (max)
	2016	9.9 ± 3.4	0.06	26.7
	2017	10.9 ± 3.3	1.3	34.6
	2018	9.8 ± 3.2	1.9	44.2

S3 Means and standard deviation of inorganic nitrogen and phosphorous by sub-basin for the whole period considered (2011-2018).

Sub-basin	Tot number of plankton cells (median ± iqr)	Inorganic nitrogen (mg/l) (median ± iqr)	Inorganic phosphorous(mg/l) (median ± iqr)
EC	891 584 ± 782 829	0.06± 0.09	0.004 ± 0.002
ENC1	909 002 ± 1 091 968	0.04 ± 0.09	0.005 ± 0.002
ENC2	976 457 ± 730 403	0.06 ± 0.24	0.003 ± 0.002
ENC4	1 332 582 ± 764 522	0.07 ± 0.09	0.003 ± 0.003
PC2	7 995 540 ± 7 513 442	0.18 ± 0.24	0.006 ± 0.004
PNC1	651 231 ± 1 060 806	0.12 ± 0.11	0.003 ± 0.003
PNC2PC1	1 207 968 ± 1 056 556	0.13 ± 0.25	0.011 ± 0.016