The following appendices (1 to 4) accompany the article

Modeling the impact of oyster culture on a mudflat food web in Marennes-Oléron Bay (France)

Delphine Leguerrier[1], Nathalie Niquil[1,*], Aurélie Petiau[1], Alain Bodoy[2]

[1]Laboratoire de Biologie et Environnement Marins, EA 3168, Université de la Rochelle, Pôle Sciences et Technologie, av. Michel Crépeau, 17042 La Rochelle Cedex 1, France

[2]Centre de Recherche sur les Ecosystèmes Marins et Aquacoles (CREMA / Unité Mixte de Recherche 10, CNRS-IFREMER), BP 5, 17137 L'Houmeau, France

Corresponding author. Email: nniquil@univ-lr.fr

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Appendix 1. Details on macrofauna groups outside the oyster tables. Ninety-eight % of the total macrofauna was taken into account and divided into 4 categories according to their class (data from P.G. Sauriau, used in Leguerrier et al. 2003). Diets are given according to the following abbreviations: ssd = facultative suspension feeders, dep = deposit-feeders, sus = suspensivores (filter feeders), car = carnivores, omn = omnivores

Compartment and species			Biomass mg C m^{-2}	% of total macrofauna	Diet
Bivalves: bbiv			**1111.81**	**57.6%**	
Macoma balthica	Mollusca	Bivalvia	450.68	23%	ssd
Scrobicularia plana (= *S. piperata*)	Mollusca	Bivalvia	397.36	21%	ssd
Abra nitida	Mollusca	Bivalvia	133.18	7%	dep
Abra tenuis	Mollusca	Bivalvia	48.95	2.5%	dep
Cerastoderma (= *Cardium*) *edule*	Mollusca	Bivalvia	36.10	1.9%	sus
Tapes philippinarum	Mollusca	Bivalvia	23.13	1.2%	sus
Mytilus edulis	Mollusca	Bivalvia	17.16	0.9%	sus
Parvicardium ovale	Mollusca	Bivalvia	5.25	0.3%	sus
Annelids and nemerteans: bann			**385.54**	**20%**	
Sternaspis scutata	Annelida	Polychaeta	95.85	5%	dep
Nephtys hombergii	Annelida	Polychaeta	61.47	3.2%	car
Nemertes	nemertes		53.13	2.8%	car
Hediste (= *Nereis*) *diversicolor*	Annelida	Polychaeta	45.32	2.4%	omn
Glycera sp.	Annelida	Polychaeta	39.07	2%	car
Euclymene (= *Clymene*) *oerstedii*	Annelida	Polychaeta	25.60	1.3%	dep
Pseudopolydora antennata	Annelida	Polychaeta	24.51	1.3%	dep
Clymenura tricirrata	Annelida	Polychaeta	15.20	0.8%	dep
Ampharete acutifrons (= *A. grubei*)	Annelida	Polychaeta	5.72	0.30%	car
Diopatra neapolitana	Annelida	Polychaeta	5.47	0.28%	car
Heteromastus filiformis	Annelida	Polychaeta	5.10	0.26%	dep
Neanthes (= *Nereis*) *succinea*	Annelida	Polychaeta	4.90	0.25%	dep
Terebellides stroemi	Annelida	Polychaeta	4.21	0.22%	car
Gastropods: bgas			**321.82**	**16.7%**	
Hydrobia ulvae (*Peringia ulvae*)	Mollusca	Gastropoda	308.90	16%	dep
Ocenebra erinacea	Mollusca	Gastropoda	12.92	0.67%	car
Arthropods: bart			**67.52**	**3.5%**	
Carcinus maenas	Arthropoda	Eumalacostraca	44.77	2.3%	omn
Corophium volutator	Arthropoda	Eumalacostraca	22.74	1.2%	dep
Total macrofauna			**1886.68**	**98%**	

Appendix 2. Data used for the inverse analysis as equations (=) or constraints (min/max values). Compartments are referred to by their abbreviations given in Table 1, mic = microfauna, bac = bacteria, n c mac = non cultivated macrofauna. Other abbreviations: B = biomass, C = consumption, F = feces, I = ingestion, M = mortality, P = production, R = respiration, Excr = excretion, NPP = net primary production, GPP = gross primary production, AE = assimilation efficiency ((P+R)/C), GE = growth efficiency (P/C), and ∝ = is proportional to

Compart.	Flow	Min value	Max value	Unit	Source	Remarks
bphy	NPP	188	307	g C m^{-2} yr^{-1}	Blanchard et al. (1996), Blanchard et al. (1997), Guarini et al. (1998)	Calculus: Max Productivity × Biofilm concentration × Exondation time
	R / GPP	5%	30%		Vézina & Platt (1988)	
	Resuspension/NPP	30%	50%		Guarini (pers. comm.)	
	Excr/ NPP	2%	55%		Baines & Pace (1991), Vézina et al. (1997)	
pphy	P/B	28.6	37.4	g C g C^{-1} yr^{-1}	Ménesguen & Hoch (1997)	
	R/GPP	5%	30%		Vézina & Platt (1988)	
	Excr/NPP	2%	55%		Baines & Pace (1991), Vézina et al. (1997)	
bbac	bbac P	296	502.5	g C m^{-2} yr^{-1}	Garet (1996)	
	bbac R	176	300	g C m^{-2} yr^{-1}		
pbac	P/B	=	392	g C g C^{-1} yr^{-1}	Newell & Linley (1984)	
	R/B	=	873	g C g C^{-1} yr^{-1}		
bmic	Excr	10% of I	R		Vézina et al. (1997)	
pmic	Excr	10% of I	R		Vézina et al. (1997)	
	C/B	236	451	g C g C^{-1} yr^{-1}		
	P/B	59	158	g C g C^{-1} yr^{-1}	Newell & Linley (1984)	
	R/B	97	293	g C g C^{-1} yr^{-1}		
bmei	P/B	2.7	31	g C g C^{-1} yr^{-1}	Giere (1993)	
	Herbivore	=	44.6%		Rzeznik (pers. comm.)	
	Carnivore	=	0.20			
pmes	Grazing	3.6	16.7	g C m^{-2} yr^{-1}	Sautour & Castel (1993)	
	F / Excr	=	5		Anderson & Ducklow (2001)	
birds	C	5.05	6	g C m^{-2} yr^{-1}	Turpie & Hockey (1996), Triplet et al. (1999), Pienkowski et al. (1984)	Biomasses: Boileau (pers. comm.)
	Shelduck C on bgas (*Hydrobia ulvae*), bphy, & bmic		0.35	g C m^{-2} yr^{-1}		
bbiv	P/B	0.1	8.9	g C g C^{-1} yr^{-1}		
	R/B	0.64	15.7	g C g C^{-1} yr^{-1}		
	F/B	1.48	7.3	g C g C^{-1} yr^{-1}		
	Diet: benthic / pelagic C	30%	70%			
	Diet in the pelagic layer	∝ biomass				No selection
bgas	P/B	0.33	6.58	g C g C^{-1} yr^{-1}	Biomass and diets: Kang (pers. comm.)	No specific R/B found
	R/B					Range of R/B bivalves taken
	Carnivores	=	96%		Rates: literature (reviewed in Leguerrier et al. 2003)	
bann	P/B	0.2	6.55	g C g C^{-1} yr^{-1}		
	R/B	3.9		g C g C^{-1} yr^{-1}		
	Carnivores	=	50%			
bart	P/B	1.08	8.25	g C g C^{-1} yr^{-1}		No specific R/B found
	R/B					Range of R/B bivalves taken
	Carnivores	=	58%			
bcoy	Commercial P/B	0.27	0.44	g C g C^{-1} yr^{-1}		Shell of dead oysters + commercial P: exported
	R/B	3.1	6.6	g C g C^{-1} yr^{-1}		
	(F + M)/B	11.5 + 9%	51.6 + 18%	g C g C^{-1} yr^{-1}	Details given in Table 2b	F + flesh of dead oysters
	Pred by bgas / commercial P	=	1%			Go to bPOC
	Diet in the pelagic layer	∝ biomass (no selection)				
	Living particles sedimenting	=	70	g C m^{-2} yr^{-1}		In simulation B
	Proportion in PSF	∝ biomass				
General	GE	10%	60%		Vézina et al. (1997)	Bacteria, microfauna
	GE	10%	30%		Savenkoff et al. (2001)	Bmei, pmes, n c mac & nekton
	AE (all cpt except bac & mci)	50%	90%			

Appendix 3. Details on data and calculations concerning oysters. Values are given for Simulation B (16 % of mudflat area covered by oyster tables)

Abbrev.	Name	Value	Source
Biomass on oyster tables			
TW	Total weight	4.39 kg m^{-2}	Le Moine (pers. comm.)
WW	Wet weight (tissues)	WW/TW = 0.12	Le Moine (pers. comm.)
DW	Dry weight (tissues)	DW / WW = 0.15	Bernard (1974)
AFDW	Ash free dry weight (tissues)	AFDW / DW = 0.9	Jean & Thouzeau (1995)
CW	Carbon weight (tissues)	CW / AFDW = 0.4	Jean & Thouzeau (1995)
SW	Shell total weight	SW = TW – WW	
OMSW	Shell organic matter weight	OMSW = 33 % (SW)	Razet et al. (1990)
CSW	Shell carbon weight	CSW = 3 % (OMSW) = 1 % (SW)	Pouvreau (pers. comm.)
Average Brouage square meter			
	Surface of oyster beds	2731 ha	Le Moine (pers. comm.)
	Surface of MOB	17 000 ha	Le Moine (pers. comm.)
SB	Shell average biomass	6.2 g C m^{-2}	
TB	Tissue average biomass	4.6 g C m^{-2}	
Feces production			
Fmin	Feces production minimum	0.01 g h^{-1} g DW^{-1}	Razet et al. (1990)
Fmax	Feces production maximum	0.045 g h^{-1} g DW^{-1}	Razet et al. (1990)
FC%	Fraction of carbon in feces	4.72 %	Razet et al. (1990)
C Fmin	Feces production minimum , in C	11.5 g C yr^{-1} g C^{-1}	
C Fmax	Feces production maximum , in C	51.7 g C yr^{-1} g C^{-1}	
Commercial production			
P min	110 000 tons produces 30 000 tons	0.27 yr^{-1}	Bacher (1989)
P max	90 000 tons produces 40 000 tons	0.4 yr^{-1}	Bacher (1989)
P/B	Average production rate	0.36 yr^{-1}	
Pseudofeces production			
Fil	Filtration rate	4–7 l h^{-1} g DW^{-1}	Smaal & Zurburg (1997)
[SES]	Seston concentration	0.025 – 0.17 g l^{-1}	Razet et al. (1990)
[SES] C%	Fraction of carbon in seston	4.03 %	Razet et al. (1990)
SRi	Specific rejection rate for seston concentration i	SR25 = 50 %; SR170 = 83 %	Barillé et al. (1997)
<PSF>	Mean pseudofeces production	254.4 g C yr^{-1} g C^{-1}	Barillé et al. (1997)
Respiration			
R O_2	Respiration rate (T: temperature)	R O_2 = (–0.432 + 0.613 $T^{1.042}$) $DW^{0.8}$	Bougrier et al. (1995)
NRJ/O_2	Conversion rate : energetic equivalent of O_2	1 mg O_2 = 1/0.7/20.08 J	Barillé et al. (1995)
Tmin	Temperature minimums per season (Winter-Spring-Summer-Autumn)	1 - 6 - 15 - 16 °C	Blanchard et al. (1996)
Tmax	Temperature maximums per season (Winter-Spring-Summer-Autumn)	11 - 19 - 29 - 25 °C	Blanchard et al. (1996)
R J	Respiration rate (energetic value)	62 – 133 J yr^{-1} g DW^{-1}	
C/NRJ	Conversion rate: energetic value of carbon	1 mg C = 55.67 J	
C Rmin	Respiration rate minimum	3.1 g C yr^{-1} g C^{-1}	
C Rmax	Respiration rate maximum	6.6 g C yr^{-1} g C^{-1}	
Mortality			
M min	Natural mortality rate minimum	9 % of the production	Soletchnik et al. (1999)
M max	Natural mortality rate maximum	18 % of the production	Soletchnik et al. (1999)

Appendix 4. Biomass variations due to oyster tables in the Eastern MOB mudflat. The macrofaunal biomass is reduced under oyster tables. The contributions of bivalves, gastropods, annelids and arthropods (given in parentheses) vary under the tables to the benefit of annelids and arthropods at the expense of the bivalves (Sauriau et al. 1989). The meiofaunal biomass is enhanced under oyster tables (Castel et al. 1989). The third column gives the weighted average: (1 – % area in culture) × biomass outside oyster tables + % area in culture × biomass under oyster tables. These data were used to calculate the biomasses under oyster tables from the knowledge of the biomasses outside them

Biomass (g C m^{-2})	Outside oyster tables	Under oyster tables	Mean m^2 with 16 % oyster tables (Simulation B)
Meiofauna:	0.44	1.61	0.62
Total macrofauna:	1.9	0.424	1.66
Bivalves	1.11 (58 %)	0.111 (26 %)	0.95 (57 %)
Annelids	0.39 (20 %)	0.199 (47 %)	0.36 (21.5 %)
Gastropods	0.32 (17 %)	0.067 (16 %)	0.28 (17 %)
Arthropods	0.08 (4 %)	0.047 (11 %)	0.07 (4.5 %)

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