

The following supplement accompanies the article

Larvae define spawning habitat of bocaccio rockfish *Sebastes paucispinis* within and around a large southern California marine reserve

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Supplement 1. Detailed results of statistical and otolith ageing analyses of larval bocaccio data collected within the Cowcod Conservation Area within the Southern California Bight

Table S1. R^2 values for correlations between model environmental covariates in each study year.

2002	Depth	SST	Chlorophyll
Depth	1		
SST	0.02	1	
Chlorophyll	0.09	0.20	1
2003	Depth	SST	Chlorophyll
Depth	1		
SST	0.00	1	
Chlorophyll	0.09	0.35	1
2004	Depth	SST	Chlorophyll
Depth	1		
SST	0.09	1	
Chlorophyll	0.04	0.11	1

Table S2. *Sebastes paucispinis*. Age, larval stage (RH = recently hatched, PF = preflexion, and PO = postflexion), sample size (N = 174), mean total length (Std Dev = standard deviation) and length ranges (both in mm) for larvae included in otolith ageing analysis.

Year	Age (Days)	Stage	N	Mean length (Std Dev)	Length range
2002	0	RH	15	3.5 (0.23)	3.0-3.8
	1	RH	27	3.8 (0.47)	3.1-4.9
	2	PF	8	4.3 (0.41)	3.9-5.1
	3	PF	11	4.4 (0.43)	3.0-5.4
	4	PF	3	4.8 (0.27)	4.6-5.1
	5	PF	4	4.6 (0.22)	4.4-4.9
	6	PF	3	5.1 (0.17)	4.9-5.3
	7	PF	1		5.9
	8	PO	1		5.2
	10	PF	1		6
	12	PF	1		6.5
	13	PF	1		6.7
	14	PO	1		7.4
	15	PF, PO	2	6.9 (0.14)	6.8-7.0
	16	PO	1		7.7
2003	19	PO	1		8.1
	0	RH	20	3.7 (0.44)	3.0-4.7
	1	RH	39	4.1 (0.33)	3.4-5.1
	2	PF	12	4.2 (0.32)	3.5-4.7
	3	PF	3	5.1 (0.23)	4.8-5.3
	4	PF	3	5.1 (0.38)	4.7-5.4
	5	PF	1		4.6
	6	PF	2	5.8 (0.13)	5.7-5.9
	7	PF	1		5.2
	8	PF	2	5.9 (0.00)	5.9
	9	PF	3	6.0 (0.50)	5.4-6.3
	10	PF	1		6.1
	11	PF	1		6.6
	14	PF	1		6.6
	15	PO	1		7.9
	16	PF	1		6.9
	18	PO	1		7.1
22	PO	1		8.6	

Table S3. *Sebastes paucispinis*. Global Moran's I and p-value for residuals of models with (autologistic) and without a spatial covariate by year and stage (RH = recently hatched, PF = preflexion, and PO = postflexion larvae). na indicates that the slope of a nonspatial model was not significant and hence we did not test for residual spatial autocorrelation. LCI and UCI are lower and upper 90% confidence intervals, respectively, and p-value was assessed at $\alpha = 0.05$.

Dependent variable	Model type	Global Moran's I	p-value	Slope _{PSH}	LCI	UCI	p-value
2002 RH	nonspatial	1.46	0.07	1.69	0.68	2.73	0.01
2002 PF	nonspatial	na	na	0.72	-0.30	1.70	0.24
2003 RH	nonspatial	1.56	0.06	2.76	1.72	3.94	< 0.0001
2003 PF	nonspatial	1.51	0.07	-2.03	-4.34	-0.56	0.06
2004 RH	nonspatial	2.39	0.01	1.69	0.70	2.82	0.01
	autologistic	1.31	0.09	1.55	0.51	2.72	0.02
2004 PF	nonspatial	na	na	-0.05	-0.97	0.87	0.93
2004 PO	nonspatial	na	na	-0.39	-1.37	0.54	0.50

Table S4. *Sebastes paucispinis*. Model selection results for logistic regression analysis of environmental parameters on recently hatched (RH) and preflexion (PF) larval bocaccio presence in 2002. The number of parameters (K) including the intercept, adjusted Akaike Information Criterion (AICc), difference between AICc of each model and the lowest AICc (Δ AICc) and the relative weights (w_i) were given for each candidate model.

Dependent variable	Model	K	AICc	Δ AICc	w_i
RH	depth + chlorophyll	3	73.89	0	0.30
	chlorophyll	2	74.59	0.69	0.21
	depth + sst	3	75.54	1.65	0.13
	depth	2	75.57	1.68	0.13
	depth + sst + chlorophyll	4	75.87	1.98	0.11
	sst + chlorophyll	3	76.55	2.65	0.08
	sst	2	78.61	4.72	0.03
PF	sst	2	84.71	0	0.30
	sst + chlorophyll	3	85.57	0.86	0.19
	chlorophyll	2	86.02	1.32	0.15
	depth	2	86.27	1.56	0.14
	depth + sst	3	86.88	2.17	0.10
	depth + sst + chlorophyll	4	87.7	2.99	0.07
	depth + chlorophyll	3	88.14	3.43	0.05

Table S5. *Sebastes paucispinis*. Model selection results for logistic regression analysis of environmental parameters on bocaccio presence in 2003. RH = recently hatched, PF = preflexion larvae. The number of parameters (K) including the intercept, adjusted Akaike Information Criterion (AICc), difference between AICc of each model and the lowest AICc (Δ AICc) and the relative weights (w_i) were given for each candidate model.

Dependent variable	Model	K	AICc	Δ AICc	w_i
RH	depth + chlorophyll	3	74.45	0	0.51
	depth + sst + chlorophyll	4	76.32	1.87	0.20
	depth + sst	3	76.46	2.01	0.19
	depth	2	77.77	3.32	0.10
	chlorophyll	2	86.45	12.00	0
	sst + chlorophyll	3	88.62	14.17	0
	sst	2	93.42	18.97	0
PF	depth + sst + chlorophyll	4	80.49	0	0.36
	depth + chlorophyll	3	80.81	0.32	0.31
	depth	2	82.04	1.55	0.17
	depth + sst	3	84.21	3.72	0.06
	chlorophyll	2	84.48	3.99	0.05
	sst + chlorophyll	3	85.55	5.06	0.03
	sst	2	85.67	5.18	0.03

Table S6. *Sebastes paucispinis*. Model selection results for logistic regression analysis of environmental parameters on bocaccio presence in 2004. RH = recently hatched, PF = preflexion, and PO = postflexion larvae. The number of parameters (K) including the intercept, adjusted Akaike Information Criterion (AICc), difference between AICc of each model and the lowest AICc (Δ AICc) and the relative weights (w_i) were given for each candidate model.

Dependent variable	Model	K	AICc	Δ AICc	w_i
RH	depth + sst	3	76.9	0	0.63
	depth + sst + chlorophyll	4	78.04	1.13	0.36
	depth	2	86.58	9.68	0
	sst	2	87.18	10.28	0
	sst + chlorophyll	3	88.71	11.81	0
	depth + chlorophyll	3	88.76	11.85	0
	chlorophyll	2	104.55	27.65	0
PF	sst	2	104.33	0	0.29
	chlorophyll	2	105.12	0.79	0.19
	depth	2	105.23	0.89	0.18
	sst + chlorophyll	3	106.01	1.68	0.12
	depth + sst	3	106.31	1.97	0.11
	depth + chlorophyll	3	107.29	2.96	0.07
	depth + sst + chlorophyll	4	108.1	3.77	0.04
PO	chlorophyll	2	98.69	0	0.41
	depth + chlorophyll	3	100.15	1.46	0.20
	sst + chlorophyll	3	100.46	1.76	0.17
	depth + sst + chlorophyll	4	101.61	2.92	0.10
	depth	2	102.27	3.58	0.07
	sst	2	103.69	5	0.03
	depth + sst	3	104.39	5.69	0.02

Table S7. *Sebastes paucispinis*. Global Moran's I and p-values testing for spatial autocorrelation in the most plausible model from Tables S3-S5. RH = recently hatched, PF = preflexion, and PO = postflexion larvae. If significant spatial autocorrelation was detected, then a spatial autocovariate was included in the models. If none of the covariates had a slope that differed from zero for a given dependent variable, then we did not test for residual spatial autocorrelation (i.e., "na").

Dependent variable	Model	Global Moran's I	p-value
2002 RH	nonspatial	1.11	0.13
2002 PF	nonspatial	na	na
2003 RH	nonspatial	0.05	0.48
2003 PF	nonspatial	1.62	0.05
2004 RH	nonspatial	1.92	0.03
	autologistic	1.46	0.07
2004 PF	nonspatial	na	na
2004 PO	nonspatial	2.00	0.02
	autologistic	1.38	0.08