

No	Item name	Your input	Help reference no.
1	Submission Date	4/15/2014	
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17	Data submitter name	Dylan H. Redman	2.1
18	Data submitter institution	Northeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	2.2
19	Data submitter address	212 Rogers Ave. Milford, CT 06418	2.3
20	Data submitter phone	203-882-6518	2.4
21	Data submitter email	Dylan.Redman@noaa.gov	2.5
22	Title	The effect of ocean acidification on otolith condition and growth of juvenile scup, <i>Stenotomus chrysops</i>	3
23	Abstract	Increasing amounts of atmospheric carbon dioxide from human industrial activities are causing changes in global ocean carbon chemistry resulting in a reduction in pH, a process termed ocean acidification. Studies have demonstrated adverse effects on calcifying organisms, particularly some invertebrates, corals, sea urchins, pteropods, and coccolithophores. It is important to determine which species are sensitive to elevated levels of CO ₂ because of the potential impacts to ecosystems, marine resources, biodiversity, food webs, populations and effects of human communities and economies. There have been few studies examining the effects of ocean acidification on marine fish, particularly the juvenile stages of species that support important fisheries. We examined the effects of elevated levels of CO ₂ on the growth, survival, otolith (ear bone) condition and the skeleton of juvenile scup, <i>Stenotomus chrysops</i> , a species that supports both commercial and recreational fisheries. Elevated levels of pCO ₂ (>1300µatm) had no statistically significant effect on growth, survival, or otolith condition after 8 weeks of rearing. There was a trend towards a greater gain in weight and length in scup exposed to the mid-level (1726 µatm) and the high level (2614µ) treatments of pCO ₂ when compared to the fish in the control (1205µatm) treatments, but these differences were not statistically significant. X-ray analysis of the fish revealed a slightly higher incidence of hyper-ossification in the vertebrae of a few scup from the highest treatments compared to fish from the control treatments. Our results show that juvenile scup are tolerant to increases in levels of environmental pCO ₂ , possibly due to conditions this species encounters in a naturally variable environment.	4
24	Purpose	To determine whether varying levels of PCO ₂ have any effect on length, weight, otolith size, otolith shape or otolith mass of juvenile scup.	5
25	Start date	8/24/2011	6
26	End date	10/19/2011	7
27	Westbd longitude	73° 3' 8" W	8.1
28	Eastbd longitude	73° 3' 8" W	8.2
29	Northbd latitude	41° 12' 42" N	8.3
30	Southbd latitude	41° 12' 42" N	8.4
31	Spatial reference system	WGS 84	9
32	Sea names	Long Island Sound, Wepawaug River	10
33	Funding Agency	NOAA's Ocean Acidification Program	11
34	Projects	none	12
35	Platform-1 name	NOAA Laboratory Milford, CT	13.1
36	Platform-1 ID	none	13.2
37	Platform-1 type	Research Laboratory	13.3
38	Platform-1 owner	NOAA	13.4
39	Platform-1 country	USA	13.5
40	Platform-2 name	none	13.1
41	Platform-2 ID	none	13.2
42	Platform-2 type	none	13.3
43	Platform-2 owner	none	13.4
44	Platform-2 country	none	13.5
45	Platform-3 name	none	13.1
46	Platform-3 ID	none	13.2
47	Platform-3 type	none	13.3
48	Platform-3 owner	none	13.4
49	Platform-3 country	none	13.5
50	EXPCODE	none	14
51	Cruise ID	none	15
52	Section	none	16
53	Dataset ID	none	17
54	DOI	none	18
55	Dataset citation	Perry, D.M., D.H. Redman, J.C. Widman Jr., S.L. Meseck, A. King, and J.J. Pereira	19
56	References		20
57	Supplemental information	none	21
58	DIC: Variable abbreviation in data files	DIC	22.1
59	DIC: Observation type	Dissolved inorganic carbon	22.2
60	DIC: In-situ observation / manipulation condition / response variable	Manipulation condition	22.3
61	DIC: Variable unit	umol/kg	22.4
62	DIC: Measured or calculated	Calculated	22.5
63	DIC: Sampling instrument		22.6
64	DIC: Analyzing instrument		22.7
65	DIC: Detailed sampling and analyzing information		22.8
66	DIC: Field replicate information		22.9
67	DIC: Standardization technique description		22.10.1
68	DIC: Frequency of standardization		22.10.2
69	DIC: CRM manufacturer		22.10.3.1
70	DIC: Batch number		22.10.3.2
71	DIC: Poison used to kill the sample		22.11.1
72	DIC: Poison volume		22.11.2
73	DIC Poisoning correction description		22.11.3
74	DIC: Uncertainty		22.12

75	DIC: Data quality flag description		22.13
76	DIC: Method reference (citation)		22.14
77	DIC: Researcher Name		22.15.1
78	DIC: Researcher Institution		22.15.2
79	TA: Variable abbreviation in data files	TA	23.1
80	TA: Observation type	Laboratory experiment	23.2
81	TA: In-situ observation / manipulation condition / response variable	Manipulation condition	23.3
82	TA: Variable unit	umol/kg	23.4
83	TA: Measured or calculated	Measured	23.5
84	TA: Sampling instrument	Amber 250 ml polypropylene bottles	23.6
85	TA: Analyzing instrument	Alkalinity titrator	23.7
86	TA: Type of titration		23.8
87	TA: Cell type (open or closed)	Open	23.9
88	TA: Curve fitting method		23.10
89	TA: Detailed sampling and analyzing information		23.11
90	TA: Field replicate information		23.12
91	TA: Standardization technique description		23.13.1
92	TA: Frequency of standardization		23.13.2
93	TA: CRM manufacturer	Andrew Dickson's lab at Scripps Institute of Oceanography	23.13.3.1
94	TA: Batch Number	CRM 112 and CRM 98	23.13.3.2
95	TA: Poison used to kill the sample	None	23.14.1
96	TA: Poison volume	None	23.14.2
97	TA: Poisoning correction description	no correction.	23.14.3
98	TA: Magnitude of blank correction		23.15
99	TA: Uncertainty		23.16
100	TA: Data quality flag description		23.17
101	TA: Method reference (citation)	Used spectrometric method from Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp.	23.23
102	TA: Researcher Name	Andrew King	23.19.1
103	TA: Researcher Institution	Northeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	23.19.2
104	pH: Variable abbreviation in data files	pH	24.1
105	pH: Observation type	Laboratory experiment	24.2
106	pH: In-situ observation / manipulation condition / response variable	Manipulation condition	24.3
107	pH: Measured or calculated	Measured	24.4
108	pH: Sampling instrument	Amber 250 ml polypropylene bottles	24.5
109	pH: Analyzing instrument	Varian Cary 100 Spectrometer	24.6
110	pH: pH scale	Total	24.7
111	pH: Temperature of measurement	20 C	24.8
112	pH: Detailed sampling and analyzing information	Varian Cary 100 Spectrometer, M-cresol purple Lot #1080-253	24.9
113	pH: Field replicate information		24.10
114	pH: Standardization technique description	none	24.11.1
115	pH: Frequency of standardization		24.11.2
116	pH: pH values of the standards		24.11.3
117	pH: Temperature of standardization		24.11.4
118	pH: Temperature correction method		24.12
119	pH: at what temperature was pH reported	20	24.13
120	pH: Uncertainty	Values were not corrected for the dye	24.14
121	pH: Data quality flag description		24.15
122	pH: Method reference (citation)	Used spectrometric method from Dickson, A.G., Sabine, C.L. and Christian, J.R. (Eds.) 2007. Guide to best practices for ocean CO2 measurements. PICES Special Publication 3, 191 pp.	24.16
123	pH: Researcher Name	Andrew King	24.17.1
124	pH: Researcher Institution	Northeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	24.17.2
125	pCO2A: Variable abbreviation in data files	pCO2	25.1
126	pCO2A: Observation type	Laboratory experiment	25.2
127	pCO2A: In-situ observation / manipulation condition / response variable	Manipulation condition	25.3
128	pCO2A: Variable unit	uatm	25.4
129	pCO2A: Measured or calculated	Calculated	25.5
130	pCO2A: Sampling instrument		25.6
131	pCO2A: Location of seawater intake		25.7
132	pCO2A: Depth of seawater intake		25.8
133	pCO2A: Analyzing instrument		25.9
134	pCO2A: Detailed sampling and analyzing information		25.10
135	pCO2A: Equilibrator type		25.11.1
136	pCO2A: Equilibrator volume (L)		25.11.2
137	pCO2A: Vented or not		25.11.3
138	pCO2A: Water flow rate (L/min)		25.11.4
139	pCO2A: Headspace gas flow rate (L/min)		25.11.5
140	pCO2A: How was temperature inside the equilibrator measured .		25.11.6
141	pCO2A: How was pressure inside the equilibrator measured.		25.11.7
142	pCO2A: Drying method for CO2 gas		25.12
143	pCO2A: Manufacturer		25.13.1
144	pCO2A: Model		25.13.2
145	pCO2A: Resolution		25.13.3
146	pCO2A: Uncertainty		25.13.4
147	pCO2A: Standardization technique description		25.14.1
148	pCO2A: Frequency of standardization		25.14.2
149	pCO2A: Manufacturer of standard gas		25.14.3.1
150	pCO2A: Concentrations of standard gas		25.14.3.2
151	pCO2A: Uncertainties of standard gas		25.14.3.3
152	pCO2A: Water vapor correction method		25.15
153	pCO2A: Temperature correction method		25.16
154	pCO2A: at what temperature was pCO2 reported		25.17
155	pCO2A: Uncertainty		25.18
156	pCO2A: Data quality flag description		25.19
157	pCO2A: Method reference (citation)		25.20
158	pCO2A: Researcher Name		25.21.1
159	pCO2A: Researcher Institution		25.21.2
160	pCO2D: Variable abbreviation in data files		26.1

161	pCO2D: Observation type		26.2
162	pCO2D: In-situ observation / manipulation condition / response variable		26.3
163	pCO2D: Variable unit		26.4
164	pCO2D: Measured or calculated		26.5
165	pCO2D: Sampling instrument		26.6
166	pCO2D: Analyzing instrument		26.7
167	pCO2D: Storage method		26.8
168	pCO2D: Seawater volume (mL)		26.9
169	pCO2D: Headspace volume (mL)		26.10
170	pCO2D: Temperature of measurement		26.11
171	pCO2D: Detailed sampling and analyzing information		26.12
172	pCO2D: Field replicate information		26.13
173	pCO2D: Manufacturer		26.14.1
174	pCO2D: Model		26.14.2
175	pCO2D: Resolution		26.14.3
176	pCO2D: Uncertainty		26.14.4
177	pCO2D: Standardization technique description		26.15.1
178	pCO2D: Frequency of standardization		26.15.2
179	pCO2D: Temperature of standardization		26.15.3
180	pCO2D: Manufacturer of standard gas		26.15.4.1
181	pCO2D: Concentrations of standard gas		26.15.4.2
182	pCO2D: Uncertainties of standard gas		26.15.4.3
183	pCO2D: Water vapor correction method		26.16
184	pCO2D: Temperature correction method		26.17
185	pCO2D: at what temperature was pCO2 reported		26.18
186	pCO2D: Uncertainty		26.19
187	pCO2D: Data quality flag description		26.20
188	pCO2D: Method reference (citation)		26.21
189	pCO2D: Researcher Name		26.22.1
190	pCO2D: Researcher Institution		26.22.2
191	Var1: Variable abbreviation in data files	Initial number of fish	27.1
192	Var1: Full variable name	Number of fish each tank was initially stocked with	27.2
193	Var1: Climate and Forecast standard name		27.3
194	Var1: Observation type	Laboratory experiment	27.4
195	Var1: In-situ observation / manipulation condition / response variable	Manipulation condition	27.5
196	Var1: Variable unit	Number of individual fish	27.6
197	Var1: Measured or calculated	Measured	27.7
198	Var1: Sampling instrument	Counting	27.8
199	Var1: Analyzing instrument		27.9
200	Var1: Duration (for settlement/colonization methods)	56 days	27.10
201	Var1: Detailed sampling and analyzing information	This variable describes the number of fish stocked into each tank at the start of the experiment	27.11
202	Var1: Field replicate information	Fish were stocked into each tank once at the beginning of the experiment	27.12
203	Var1: Uncertainty		27.13
204	Var1: Data quality flag description		27.14
205	Var1: Method reference (citation)		27.15
206	Var1: Biological subject	Scup	27.16
207	Var1: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
208	Var1: Researcher Name	Dean Perry	27.18.1
209	Var1: Researcher Institution	National Marine Fisheries Service	27.18.2
210	Var2: Variable abbreviation in data files	Number of fish sampled	27.1
211	Var2: Full variable name	Number of live fish remaining in each tank at time of sampling	27.2
212	Var2: Climate and Forecast standard name		27.3
213	Var2: Observation type	Laboratory experiment	27.4
214	Var2: In-situ observation / manipulation condition / response variable	Reponse variable	27.5
215	Var2: Variable unit	Number of individual fish	27.6
216	Var2: Measured or calculated	Measured	27.7
217	Var2: Sampling instrument	Counting	27.8
218	Var2: Analyzing instrument	None	27.9
219	Var2: Duration (for settlement/colonization methods)	56 days	27.10
220	Var2: Detailed sampling and analyzing information	each fish was individually counted while being weighed and measured	27.11
221	Var2: Field replicate information	All live fish were sampled weekly for the duration of the experiment	27.12
222	Var2: Uncertainty		27.13
223	Var2: Data quality flag description		27.14
224	Var2: Method reference (citation)		27.15
225	Var2: Biological subject	Scup	27.16
226	Var2: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
227	Var2: Researcher Name	Dean Perry	27.18.1
228	Var2: Researcher Institution	National Marine Fisheries Service	27.18.2
229	Var3: Variable abbreviation in data files	Fish length mean (mm)	27.1
230	Var3: Full variable name	mean total length of fish in each tank	27.2
231	Var3: Climate and Forecast standard name		27.3
232	Var3: Observation type	Laboratory experiment	27.4
233	Var3: In-situ observation / manipulation condition / response variable	Response variable	27.5
234	Var3: Variable unit	millimeters (mm)	27.6
235	Var3: Measured or calculated	measured	27.7
236	Var3: Sampling instrument	Metric fish measuring board	27.8
237	Var3: Analyzing instrument	Microsoft Excel was used to determine means	27.9
238	Var3: Duration (for settlement/colonization methods)	56 days	27.10
239	Var3: Detailed sampling and analyzing information		27.11
240	Var3: Field replicate information	All live fish were sampled weekly for the duration of the experiment	27.12
241	Var3: Uncertainty		27.13
242	Var3: Data quality flag description		27.14
243	Var3: Method reference (citation)		27.15
244	Var3: Biological subject	Scup	27.16
245	Var3: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
246	Var3: Researcher Name	Dean Perry	27.18.1
247	Var3: Researcher Institution	National Marine Fisheries Service	27.18.2

248	Var4: Variable abbreviation in data files	Fish weight (g)	27.1
249	Var4: Full variable name	mean weight of the fish in each tank	27.2
250	Var4: Climate and Forecast standard name		27.3
251	Var4: Observation type	Laboratory experiment	27.4
252	Var4: In-situ observation / manipulation condition / response variable	Response variable	27.5
253	Var4: Variable unit	grams (g)	27.6
254	Var4: Measured or calculated	measured	27.7
255	Var4: Sampling instrument		27.8
256	Var4: Analyzing instrument	Mettler PM4600 balance	27.9
257	Var4: Duration (for settlement/colonization methods)	56 days	27.10
258	Var4: Detailed sampling and analyzing information		27.11
259	Var4: Field replicate information	All live fish were sampled weekly for the duration of the experiment	27.12
260	Var4: Uncertainty		27.13
261	Var4: Data quality flag description		27.14
262	Var4: Method reference (citation)		27.15
263	Var4: Biological subject	Scup	27.16
264	Var4: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
265	Var4: Researcher Name	Dean Perry	27.18.1
266	Var4: Researcher Institution	National Marine Fisheries Service	27.18.2
267	Var5: Variable abbreviation in data files	D.O.% saturation	27.1
268	Var5: Full variable name	Dissolved Oxygen as a percent of saturation	27.2
269	Var5: Climate and Forecast standard name		27.3
270	Var5: Observation type	Laboratory experiment	27.4
271	Var5: In-situ observation / manipulation condition / response variable	Manipulation condition	27.5
272	Var5: Variable unit	Percentage of saturation	27.6
273	Var5: Measured or calculated	Measured	27.7
274	Var5: Sampling instrument	Placed YSI probe in each tank	27.8
275	Var5: Analyzing instrument	YSI 85, Microsoft Excel was used to determine means	27.9
276	Var5: Duration (for settlement/colonization methods)	56 days	27.10
277	Var5: Detailed sampling and analyzing information	YSI 85 was calibrated daily to an air temperature which matched the water temp being sampled +/- 1°	27.11
278	Var5: Field replicate information	YSI readings were taken daily	27.12
279	Var5: Uncertainty		27.13
280	Var5: Data quality flag description		27.14
281	Var5: Method reference (citation)		27.15
282	Var5: Biological subject	Scup	27.16
283	Var5: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
284	Var5: Researcher Name	Dean Perry	27.18.1
285	Var5: Researcher Institution	National Marine Fisheries Service	27.18.2
286	Var6: Variable abbreviation in data files	D.O. mg/L	27.1
287	Var6: Full variable name	Dissolved Oxygen in milligrams per liter	27.2
288	Var6: Climate and Forecast standard name		27.3
289	Var6: Observation type	Laboratory experiment	27.4
290	Var6: In-situ observation / manipulation condition / response variable	Manipulation condition	27.5
291	Var6: Variable unit	Percentage of saturation	27.6
292	Var6: Measured or calculated	Measured	27.7
293	Var6: Sampling instrument	Placed YSI probe in each tank	27.8
294	Var6: Analyzing instrument	YSI 85, Microsoft Excel was used to determine means	27.9
295	Var6: Duration (for settlement/colonization methods)	56 days	27.10
296	Var6: Detailed sampling and analyzing information	YSI 85 was calibrated daily to an air temperature which matched the water temp being sampled +/- 1°	27.11
297	Var6: Field replicate information	YSI readings were taken daily	27.12
298	Var6: Uncertainty		27.13
299	Var6: Data quality flag description		27.14
300	Var6: Method reference (citation)		27.15
301	Var6: Biological subject	Scup	27.16
302	Var6: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
303	Var6: Researcher Name	Dean Perry	27.18.1
304	Var6: Researcher Institution	National Marine Fisheries Service	27.18.2
305	Var7: Variable abbreviation in data files	Temp C	27.1
306	Var7: Full variable name	Temperature in degrees Celcius	27.2
307	Var7: Climate and Forecast standard name		27.3
308	Var7: Observation type	Laboratory experiment	27.4
309	Var7: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
310	Var7: Variable unit	Degrees celsius	27.6
311	Var7: Measured or calculated	Measured	27.7
312	Var7: Sampling instrument	Placed YSI probe in each tank	27.8
313	Var7: Analyzing instrument	YSI 85, Microsoft Excel was used to determine means	27.9
314	Var7: Duration (for settlement/colonization methods)	56 days	27.10
315	Var7: Detailed sampling and analyzing information	No calibration is required for this measurement	27.11
316	Var7: Field replicate information	YSI readings were taken daily	27.12
317	Var7: Uncertainty		27.13
318	Var7: Data quality flag description		27.14
319	Var7: Method reference (citation)		27.15
320	Var7: Biological subject	Scup	27.16
321	Var7: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
322	Var7: Researcher Name	Dean Perry	27.18.1
323	Var7: Researcher Institution	National Marine Fisheries Service	27.18.2
324	Var8: Variable abbreviation in data files	Salinity	27.1
325	Var8: Full variable name		27.2
326	Var8: Climate and Forecast standard name		27.3
327	Var8: Observation type	Laboratory experiment	27.4
328	Var8: In-situ observation / manipulation condition / response variable	In-situ observation	27.5
329	Var8: Variable unit	Salinity units	27.6
330	Var8: Measured or calculated	Measured	27.7
331	Var8: Sampling instrument	Placed YSI probe in each tank	27.8
332	Var8: Analyzing instrument	YSI 85, Microsoft Excel was used to determine means	27.9
333	Var8: Duration (for settlement/colonization methods)	56 days	27.10

334	Var8: Detailed sampling and analyzing information	No calibration is required for this measurement	27.11
335	Var8: Field replicate information	YSI readings were taken daily	27.12
336	Var8: Uncertainty		27.13
337	Var8: Data quality flag description		27.14
338	Var8: Method reference (citation)		27.15
339	Var8: Biological subject	Scup	27.16
340	Var8: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
341	Var8: Researcher Name	Dean Perry	27.18.1
342	Var8: Researcher Institution	National Marine Fisheries Service	27.18.2
343	Var9: Variable abbreviation in data files	pH probe	27.1
344	Var9: Full variable name	pH measurement tanken with handheld meter	27.2
345	Var9: Climate and Forecast standard name		27.3
346	Var9: Observation type	Laboratory experiment	27.4
347	Var9: In-situ observation / manipulation condition / response variable	Manipulation condition	27.5
348	Var9: Variable unit	millivolts	27.6
349	Var9: Measured or calculated	Measured	27.7
350	Var9: Sampling instrument		27.8
351	Var9: Analyzing instrument	Hach HQ11D	27.9
352	Var9: Duration (for settlement/colonization methods)	56 days	27.10
353	Var9: Detailed sampling and analyzing information	Hach HQ11D was used with probe PHC28101. It was calibrated once a day prior to use with 4.01 and 10.01 buffer solutions	27.11
354	Var9: Field replicate information	pH reading were taken daily	27.12
355	Var9: Uncertainty		27.13
356	Var9: Data quality flag description		27.14
357	Var9: Method reference (citation)		27.15
358	Var9: Biological subject	Scup	27.16
359	Var9: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
360	Var9: Researcher Name	Dean Perry	27.18.1
361	Var9: Researcher Institution	National Marine Fisheries Service	27.18.2
362	Var10: Variable abbreviation in data files	Silicate	27.1
363	Var10: Full variable name	Dissolved Silicate	27.2
364	Var10: Climate and Forecast standard name		27.3
365	Var10: Observation type		27.4
366	Var10: In-situ observation / manipulation condition / response variable	in-situ observation	27.5
367	Var10: Variable unit	µmol/Kg	27.6
368	Var10: Measured or calculated	measured	27.7
369	Var10: Sampling instrument		27.8
370	Var10: Analyzing instrument	Quattro, Test range 0-20µmol/L, 10 mm flowcell with LED photometer at 820 nm, 60 samples/hr, standard deviation is 0.05 µmol/L, detetion limit is 0.01 µmol/L	27.9
371	Var10: Duration (for settlement/colonization methods)		27.10
372	Var10: Detailed sampling and analyzing information	Samples were taken in 250 ml amber polypropylene bottles and ran immediately after collection	27.11
373	Var10: Field replicate information		27.12
374	Var10: Uncertainty		27.13
375	Var10: Data quality flag description		27.14
376	Var10: Method reference (citation)	Method NO Q-066-05 Rev. 3 for QuAAtro Applications developed by the Royal Netherlands Institute for Sea Research	27.15
377	Var10: Biological subject	Scup	27.16
378	Var10: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
379	Var10: Researcher Name	Shannon Meseck	27.18.1
380	Var10: Researcher Institution	National Marine Fisheries Service	27.18.2
381	Var11: Variable abbreviation in data files	Phosphate	27.1
382	Var11: Full variable name	Dissolved Phosphate	27.2
383	Var11: Climate and Forecast standard name		27.3
384	Var11: Observation type		27.4
385	Var11: In-situ observation / manipulation condition / response variable	in-situ observation	27.5
386	Var11: Variable unit	µmol/Kg	27.6
387	Var11: Measured or calculated	Measured	27.7
388	Var11: Sampling instrument		27.8
389	Var11: Analyzing instrument	Quattro, Test range 0-4 µmol/L, 10 mm flowcell with LED photometer at 880 nm, 60 samples/hr, standard deviation is 0.01 µmol/L, detetion limit is 0.004µmol/L	27.9
390	Var11: Duration (for settlement/colonization methods)		27.10
391	Var11: Detailed sampling and analyzing information	Samples were taken in 250 ml amber polypropylene bottles and ran immediately after collection	27.11
392	Var11: Field replicate information		27.12
393	Var11: Uncertainty		27.13
394	Var11: Data quality flag description		27.14
395	Var11: Method reference (citation)	Method NO Q-064-05 Rev. 3 for QuAAtro Applications developed by the Royal Netherlands Institute for Sea Research	27.15
396	Var11: Biological subject	Scup	27.16
397	Var11: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
398	Var11: Researcher Name	Shannon Meseck	27.18.1
399	Var11: Researcher Institution	National Marine Fisheries Service	27.18.2
400	Var12: Variable abbreviation in data files	Otolith #1 area mm ²	27.1
401	Var12: Full variable name	Area in square millimeters of the first otolith that was removed from each fish after the experiment was terminated	27.2
402	Var12: Climate and Forecast standard name		27.3
403	Var12: Observation type	Laboratory experiment	27.4
404	Var12: In-situ observation / manipulation condition / response variable	Response variable	27.5
405	Var12: Variable unit	Square millimeters	27.6
406	Var12: Measured or calculated	Measured	27.7
407	Var12: Sampling instrument	Leica stereo microscope model EZ4D at 160X with camera attached	27.8
408	Var12: Analyzing instrument	Image J software	27.9
409	Var12: Duration (for settlement/colonization methods)	56 days	27.10
410	Var12: Detailed sampling and analyzing information	Each otolith was extracted from the fish, cleaned, dried and photographed under the microscope. Next the photos were analyzed using Image J software to detrmine the area. In some case we were unable to locate one or both otoliths or they broke during extraction. Those samples were not used.	27.11
411	Var12: Field replicate information	Otoliths were removed once after the experiment was terminated	27.12
412	Var12: Uncertainty		27.13
413	Var12: Data quality flag description		27.14
414	Var12: Method reference (citation)		27.15
415	Var12: Biological subject	Scup	27.16
416	Var12: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
417	Var12: Researcher Name	Dean Perry	27.18.1

394	Var12: Researcher Institution	National Marine Fisheries Service	27.18.2
395	Var13: Variable abbreviation in data files	Otolith #1 wgt. (g)	27.1
396	Var13: Full variable name	weight in grams of the first otolith that was removed from each fish after the experiment was terminated	27.2
397	Var13: Climate and Forecast standard name		27.3
398	Var13: Observation type	Laboratory experiment	27.4
399	Var13: In-situ observation / manipulation condition / response variable	Response variable	27.5
400	Var13: Variable unit	grams (g)	27.6
401	Var13: Measured or calculated	Measured	27.7
402	Var13: Sampling instrument	Mettler-Toledo balance model AB104-S/Fact balance	27.8
403	Var13: Analyzing instrument		27.9
404	Var13: Duration (for settlement/colonization methods)	56 days	27.10
405	Var13: Detailed sampling and analyzing information	Each otolith was extracted from the fish, wiped cleaned, dried and weighed on the balance. In some cases one or both otoliths or they broke during extraction.	27.11
406	Var13: Field replicate information	Otoliths were removed once after the experiment was terminated	27.12
407	Var13: Uncertainty		27.13
408	Var13: Data quality flag description		27.14
409	Var13: Method reference (citation)		27.15
410	Var13: Biological subject	Scup	27.16
411	Var13: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
412	Var13: Researcher Name	Dean Perry	27.18.1
413	Var13: Researcher Institution	National Marine Fisheries Service	27.18.2
414	Var14: Variable abbreviation in data files	Otolith #2 area mm ²	27.1
415	Var14: Full variable name	Area in square millimeters of the second otolith that was removed from each fish after the experiment was terminated	27.2
416	Var14: Climate and Forecast standard name		27.3
417	Var14: Observation type	Laboratory experiment	27.4
418	Var14: In-situ observation / manipulation condition / response variable	Response variable	27.5
419	Var14: Variable unit	Square millimeters	27.6
420	Var14: Measured or calculated	Measured	27.7
421	Var14: Sampling instrument	Leica stereo microscope model EZ4D at 160X with camera attached	27.8
422	Var14: Analyzing instrument	Image J software	27.9
423	Var14: Duration (for settlement/colonization methods)	56 days	27.10
424	Var13: Detailed sampling and analyzing information	Each otolith was extracted from the fish, cleaned, dried and photographed under the microscope. Next the photos were analyzed using Image J software to determine the area. In some case we were unable to locate one or both otoliths or they broke during extraction. Those samples were not used.	27.11
425	Var14: Field replicate information	Otoliths were removed once after the experiment was terminated	27.12
426	Var14: Uncertainty		27.13
427	Var14: Data quality flag description		27.14
428	Var14: Method reference (citation)		27.15
429	Var14: Biological subject	Scup	27.16
430	Var14: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
431	Var14: Researcher Name	Dean Perry	27.18.1
432	Var14: Researcher Institution	National Marine Fisheries Service	27.18.2
433	Var15: Variable abbreviation in data files	Otolith #2 wgt. (g)	27.1
434	Var15: Full variable name	weight in grams of the second otolith that was removed from each fish after the experiment was terminated	27.2
435	Var15: Climate and Forecast standard name		27.3
436	Var15: Observation type	Laboratory experiment	27.4
437	Var15: In-situ observation / manipulation condition / response variable	Response variable	27.5
438	Var15: Variable unit	grams (g)	27.6
439	Var15: Measured or calculated	Measured	27.7
440	Var15: Sampling instrument	Mettler-Toledo balance model AB104-S/Fact balance	27.8
441	Var15: Analyzing instrument		27.9
442	Var15: Duration (for settlement/colonization methods)	56 days	27.10
443	Var15: Detailed sampling and analyzing information	Each otolith was extracted from the fish, wiped cleaned, dried and weighed on the balance. In some cases one or both otoliths were not found or they broke during extraction.	27.11
444	Var15: Field replicate information	Otoliths were removed once after the experiment was terminated	27.12
445	Var15: Uncertainty		27.13
446	Var15: Data quality flag description		27.14
447	Var15: Method reference (citation)		27.15
448	Var15: Biological subject	Scup	27.16
449	Var15: Species Identification ID (if available)	<i>Stenotomus chrysops</i>	27.17
450	Var15: Researcher Name	Dean Perry	27.18.1
451	Var15: Researcher Institution	National Marine Fisheries Service	27.18.2
452	Var16: Variable abbreviation in data files	Date	28.1
453	Var16: Full variable name	Date Sampling took place	28.2
454	Var17: Variable abbreviation in data files	Tank #	28.1
455	Var17: Full variable name	Tanks used were 76 liter glass aquaria, tanks 1-3 had no CO2 added, tanks 4-6 were mid level treatments and tanks 7-9 had high levels of CO2 added	28.2
456	Var18: Variable abbreviation in data files	Sample ID	28.1
457	Var18: Full variable name	Identification code used to determine which fish the otolith was removed from	28.2
458	PI-4 name	Shannon L. Meseck	1.1
459	PI-4 institution	Northeast Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	1.2
460	PI-4 address	212 Rogers Ave. Milford, CT 06418	1.3
461	PI-4 phone	203-882-6528	1.4
462	PI-4 email	Shannon.Meseck@noaa.gov	1.5
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465	PI-5 address		1.3
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468	PI-6 name	Jose Pereira	1.1
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471	PI-6 phone	203-882-6538	1.4
472	PI-6 email	Jose.Pereira@noaa.gov	1.5

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