

No	Metadata element name	Your input	Help reference no.
1	Submission Date	9/19/2019	1
2	Accession no. of related data sets		2
3	Investigator-1 name	Thomas P. Hurst	3.1
4	Investigator-1 institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	3.2
5	Investigator-1 address	Hatfield Marine Science Center, Newport, OR 97365, USA	3.3
6	Investigator-1 phone	(541) 867-0222	3.4
7	Investigator-1 email	Thomas.Hurst@noaa.gov	3.5
8	Investigator-1 researcher ID		3.6
9	Investigator-1 ID type (ORCID, Researcher ID, etc.)		3.7
10	Investigator-2 name	Louise Copeman	3.1
11	Investigator-2 institution	College of Earth, Ocean, and Atmospheric Sciences; Cooperative Institute for Marine Resources Studies; Oregon State University	3.2
12	Investigator-2 address	Hatfield Marine Science Center, Newport, OR 97365, USA	3.3
13	Investigator-2 phone	541-867-0359	3.4
14	Investigator-2 email	Louise.Copeman@noaa.gov	3.5
15	Investigator-2 researcher ID		3.6
16	Investigator-2 ID type (ORCID, Researcher ID, etc.)		3.7
24	Data submitter name	Thomas P. Hurst	4.1
25	Data submitter institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	4.2
26	Data submitter address	Hatfield Marine Science Center, Newport, OR 97365, USA	4.3
27	Data submitter phone	(541) 867-0222	4.4
28	Data submitter email	Thomas.hurst@noaa.gov	4.5
29	Data submitter researcher ID		4.6
30	Data submitter ID type (ORCID, Researcher ID, etc.)		4.7
31	Title	CO2 effects on Pacific cod larvae size and behavior	5
32	Abstract	<p>High-latitude seas, which support a number of commercially important fisheries, are predicted to be most immediately impacted by ongoing ocean acidification (OA). Elevated CO2 levels have been shown to induce a range of impacts on the physiology and behavior of marine fish larvae. However, these responses have yet to be characterized for most fishery species, including Pacific cod (<i>Gadus macrocephalus</i>). Based on laboratory experiments, we present a multi-faceted analysis of the sensitivity of Pacific cod larvae to elevated CO2. Fish behavior in a horizontal light gradient was used to evaluate the sensitivity of behavioral phototaxis in 4–5 week old cod larvae. Fish at elevated CO2 levels (~1500 and 2250 μatm) exhibited a stronger phototaxis (moved more quickly to regions of higher light levels) than fish at ambient CO2 levels (~600 μatm). In an independent experiment, we examined the effects of elevated CO2 levels on growth of larval Pacific cod over the first 5 weeks of life under two different feeding treatments. Fish exposed to elevated CO2 levels (~1700 μatm) were smaller and had lower lipid levels at 2 weeks of age than fish at low (ambient) CO2 levels (~500 μatm). However, by 5 weeks of age, this effect had reversed: fish reared at elevated CO2 levels were slightly (but not significantly) larger and had higher total lipid levels and storage lipids than fish reared at low CO2. Fatty acid composition differed significantly between fish reared at high and low CO2 levels ($p < 0.01$) after 2 weeks of feeding, but this effect diminished by week 5. Effects of CO2 on FA composition of the larvae differed between the two diets, an effect possibly related more to dietary equilibrium and differential lipid class storage than a fundamental effect of CO2 on fatty acid metabolism. These experiments point to a stage-specific sensitivity of Pacific cod to the effects of OA. Further understanding of these effects will be required to predict the impacts on production of Pacific cod fisheries.</p>	6
33	Purpose	To determine the effects of CO2 on behavior, growth, and health of Pacific cod larvae	7
34	Start date	2/12/2015	8.1
35	End date	7/2/2016	8.2
36	Westbd longitude	-122.760	9.1
37	Eastbd longitude	-122.760	9.2
38	Northbd latitude	48.135	9.3
39	Southbd latitude	48.135	9.4
40	Spatial reference system	WGS 84	10
41	Geographic names	NOAA AFSC Laboratory, Newport, Oregon	11

42	Location of organism collection	Gulf of Alaska	12
43	Funding agency name	NOAA's Ocean Acidification Program	13.1
44	Funding project title	OA effects on growth and survival of Alaskan finfishes	13.2
45	Funding project ID (Grant no.)	OAPFY13.03.AFSC.004	13.3
46	Research projects	none	14
47	Platform-1 name	none	15.1
48	Platform-1 ID	none	15.2
49	Platform-1 type	none	15.3
50	Platform-1 owner	none	15.4
51	Platform-1 country	none	15.5
62	EXPOCODE	none	16
63	Cruise ID	none	17
64	Section	none	18
65	Author list for citation	Hurst, Thomas P.; Copeman, Louise A.; Haines, Scott A.; Meredith, Summer D.; Daniels, Kamilya; Hubbard, Kalyn M.	19
66	References	Hurst et al. 2019, "Elevated CO2 alters behavior, growth, and lipid consumption of Pacific cod larvae." Marine Environmental Research	20
67	Supplemental information	none	21
68	DIC: Variable abbreviation in data files	DIC	22.1
69	DIC: Observation type	Laboratory experiment	22.2
70	DIC: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	22.3
71	DIC: Manipulation method (SPECIAL USE ONLY) (SPECIAL USE ONLY)	ambient or bubbled CO2 into conditioning tank	22.4
72	DIC: Variable unit	umol/kg	22.5
73	DIC: Measured or calculated	Measured	22.6
74	DIC: Calculation method and parameters		22.7
75	DIC: Sampling instrument	Siphoning tube	22.8
76	DIC: Analyzing instrument	AIRICA (Automated InfraRed Inorganic Carbon Analyzer)	22.9
77	DIC: Detailed sampling and analyzing information		22.10
78	DIC: Field replicate information		22.11
79	DIC: Standardization technique description		22.12.1
80	DIC: Frequency of standardization		22.12.2
81	DIC: CRM manufacturer		22.12.3.1
82	DIC: Batch number		22.12.3.2
83	DIC: Poison used to kill the sample	saturated HgCl2	22.13.1
84	DIC: Poison volume		22.13.2
85	DIC Poisoning correction description	no correction.	22.13.3
86	DIC: Uncertainty	<0.05%	22.14
87	DIC: Data quality flag description	"h2oDQ" reflects reliability of data: 1=good; 2=questionable/outlier/estimated; 3=known error.	22.15
88	DIC: Method reference (citation)		22.16
89	DIC: Researcher Name	Natalie Monacci	22.17.1
90	DIC: Researcher Institution	Ocean Acidification Research Center at the University of Alaska at Fairbanks	22.17.2
91	TA: Variable abbreviation in data files	TA	23.1
92	TA: Observation type	Laboratory experiment	23.2
93	TA: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	23.3
94	TA: Manipulation method (SPECIAL USE ONLY)		23.4
95	TA: Variable unit	umol/kg	23.5
96	TA: Measured or calculated	Measured	23.6
97	TA: Calculation method and parameters		23.7
98	TA: Sampling instrument	Siphoning tube	23.8

99	TA: Analyzing instrument	VINDTA 3C (Versatile Instrument for the Determination of dissolved inorganic carbon and Total Alkalinity)	23.9
100	TA: Type of titration		23.10
101	TA: Cell type (open or closed)		23.11
102	TA: Curve fitting method		23.12
103	TA: Detailed sampling and analyzing information		23.13
104	TA: Field replicate information		23.14
105	TA: Standardization technique description		23.15.1
106	TA: Frequency of standardization		23.15.2
107	TA: CRM manufacturer	Andrew Dickson's lab at Scripps Institute of Oceanography	23.15.3.1
108	TA: Batch Number		23.15.3.2
109	TA: Poison used to kill the sample	saturated HgCl2	23.16.1
110	TA: Poison volume		23.16.2
111	TA: Poisoning correction description	no correction.	23.16.3
112	TA: Magnitude of blank correction		23.17
113	TA: Uncertainty	<0.05%	23.18
114	TA: Data quality flag description	"h2oDQ" reflects reliability of data: 1=good; 2=questionable/outlier/estimated; 3=known error.	23.19
115	TA: Method reference (citation)		23.20
116	TA: Researcher Name	Natalie Monacci	23.21.1
117	TA: Researcher Institution	Ocean Acidification Research Center at the University of Alaska at Fairbanks	23.21.2
118	pH: Variable abbreviation in data files	calcPH	24.1
119	pH: Observation type	Laboratory experiment	24.2
120	pH: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	24.3
121	pH: Manipulation method (SPECIAL USE ONLY)		24.4
122	pH: Measured or calculated	calculated	24.5
123	pH: Calculation method and parameters		24.6
124	pH: Sampling instrument		24.7
125	pH: Analyzing instrument		24.8
126	pH: pH scale	Seawater	24.9
127	pH: Temperature of measurement		24.10
128	pH: Detailed sampling and analyzing information	calculated from DIC, TA, temperature, and salinity	24.11
129	pH: Field replicate information		24.12
130	pH: Standardization technique description		24.13.1
131	pH: Frequency of standardization		24.13.2
132	pH: pH values of the standards		24.13.3
133	pH: Temperature of standardization		24.13.4
134	pH: Temperature correction method		24.14
135	pH: at what temperature was pH reported	8	24.15
136	pH: Uncertainty		24.16
137	pH: Data quality flag description	"h2oDQ" reflects reliability of data: 1=good; 2=questionable/outlier/estimated; 3=known error.	24.17
138	pH: Method reference (citation)	Lewis and Wallace 1995. Basic programs for the CO2 system in seawater. Brookhaven National Laboratory. BNL-61827	24.18
139	pH: Researcher Name	Natalie Monacci	24.19.1
140	pH: Researcher Institution	Ocean Acidification Research Center at the University of Alaska at Fairbanks	24.19.2
141	pCO2A: Variable abbreviation in data files	calcCO2	25.1
142	pCO2A: Observation type	Laboratory experiment	25.2
143	pCO2A: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	25.3
144	pCO2A: Manipulation method (SPECIAL USE ONLY)		25.4
145	pCO2A: Variable unit	uatm	25.5
146	pCO2A: Measured or calculated	Calculated	25.6
147	pCO2A: Calculation method and parameters		25.7
148	pCO2A: Sampling instrument		25.8

149	pCO2A: Location of seawater intake		25.9
150	pCO2A: Depth of seawater intake		25.10
151	pCO2A: Analyzing instrument		25.11
152	pCO2A: Detailed sampling and analyzing information	calculated from DIC, TA, temperature, and salinity	25.12
153	pCO2A: Equilibrator type		25.13.1
154	pCO2A: Equilibrator volume (L)		25.13.2
155	pCO2A: Vented or not		25.13.3
156	pCO2A: Water flow rate (L/min)		25.13.4
157	pCO2A: Headspace gas flow rate (L/min)		25.13.5
158	pCO2A: How was temperature inside the equilibrator measured .		25.13.6
159	pCO2A: How was pressure inside the equilibrator measured.		25.13.7
160	pCO2A: Drying method for CO2 gas		25.14
161	pCO2A: Manufacturer of the gas detector		25.15.1
162	pCO2A: Model of the gas detector		25.15.2
163	pCO2A: Resolution of the gas detector		25.15.3
164	pCO2A: Uncertainty of the gas detector		25.15.4
165	pCO2A: Standardization technique description		25.16.1
166	pCO2A: Frequency of standardization		25.16.2
167	pCO2A: Manufacturer of standard gas		25.16.3.1
168	pCO2A: Concentrations of standard gas		25.16.3.2
169	pCO2A: Uncertainties of standard gas		25.16.3.3
170	pCO2A: Water vapor correction method		25.17
171	pCO2A: Temperature correction method		25.18
172	pCO2A: at what temperature was pCO2 reported		25.19
173	pCO2A: Uncertainty		25.20
174	pCO2A: Data quality flag description	"h2oDQ" reflects reliability of data: 1=good; 2=questionable/outlier/estimated; 3=known error.	25.21
175	pCO2A: Method reference (citation)	Lewis and Wallace 1995. Basic programs for the CO2 system in seawater. Brookhaven National Laboratory. BNL-61827	25.22
176	pCO2A: Researcher Name	Natalie Monacchi	25.23.1
177	pCO2A: Researcher Institution	Ocean Acidification Research Center at the University of Alaska at Fairbanks	25.23.2
178	pCO2D: Variable abbreviation in data files		26.1
179	pCO2D: Observation type		26.2
180	pCO2D: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		26.3
181	pCO2D: Manipulation method (SPECIAL USE ONLY)		26.4
182	pCO2D: Variable unit		26.5
183	pCO2D: Measured or calculated		26.6
184	pCO2D: Calculation method and parameters		26.7
185	pCO2D: Sampling instrument		26.8
186	pCO2D: Analyzing instrument		26.9
187	pCO2D: Storage method		26.10
188	pCO2D: Seawater volume (mL)		26.11
189	pCO2D: Headspace volume (mL)		26.12
190	pCO2D: Temperature of measurement		26.13
191	pCO2D: Detailed sampling and analyzing information		26.14
192	pCO2D: Field replicate information		26.15
193	pCO2D: Manufacturer of the gas detector		26.16.1
194	pCO2D: Model of the gas detector		26.16.2
195	pCO2D: Resolution of the gas detector		26.16.3
196	pCO2D: Uncertainty of the gas detector		26.16.4
197	pCO2D: Standardization technique description		26.17.1
198	pCO2D: Frequency of standardization		26.17.2

199	pCO2D: Temperature of standardization		26.17.3
200	pCO2D: Manufacturer of standard gas		26.17.4.1
201	pCO2D: Concentrations of standard gas		26.17.4.2
202	pCO2D: Uncertainties of standard gas		26.17.4.3
203	pCO2D: Water vapor correction method		26.18
204	pCO2D: Temperature correction method		26.19
205	pCO2D: at what temperature was pCO2 reported		26.20
206	pCO2D: Uncertainty		26.21
207	pCO2D: Data quality flag description		26.22
208	pCO2D: Method reference (citation)		26.23
209	pCO2D: Researcher Name		26.24.1
210	pCO2D: Researcher Institution		26.24.2
211	Var1: Variable abbreviation in data files	Temp	27.1
212	Var1: Full variable name	Water temperature	27.2
213	Var1: Observation type	Laboratory experiment	27.4
214	Var1: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	27.5
215	Var1: Variable unit	degrees centigrade	27.7
216	Var1: Measured or calculated	measured	27.8
217	Var1: Calculation method and parameters		27.9
218	Var1: Sampling instrument		27.10
219	Var1: Analyzing instrument	various	27.11
220	Var1: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
221	Var1: Detailed sampling and analyzing information		27.13
222	Var1: Field replicate information		27.14
223	Var1: Uncertainty		27.15
224	Var1: Data quality flag description		27.16
225	Var1: Method reference (citation)		27.17
226	Var1: Biological subject (SPECIAL USE ONLY)		27.18
227	Var1: Species Identification code (SPECIAL USE ONLY)		27.19
228	Var1: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
229	Var1: Researcher Name	Thomas P. Hurst	27.21.1
230	Var1: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
231	Var2: Variable abbreviation in data files	Salinity	27.1
232	Var2: Full variable name	Water salinity	27.2
233	Var2: Observation type	Laboratory experiment	27.4
234	Var2: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	27.5
235	Var2: Variable unit	parts per thousand	27.7
236	Var2: Measured or calculated	measured	27.8
237	Var2: Calculation method and parameters		27.9
238	Var2: Sampling instrument		27.10
239	Var2: Analyzing instrument	Yellow Springs International meter - Model YSI 85	27.11
240	Var2: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
241	Var2: Detailed sampling and analyzing information		27.13
242	Var2: Field replicate information		27.14
243	Var2: Uncertainty		27.15
244	Var2: Data quality flag description		27.16
245	Var2: Method reference (citation)		27.17
246	Var2: Biological subject (SPECIAL USE ONLY)		27.18
247	Var2: Species Identification code (SPECIAL USE ONLY)		27.19

248	Var2: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
249	Var2: Researcher Name	Thomas P. Hurst	27.21.1
250	Var2: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
251	Var3: Variable abbreviation in data files	calcO Ar	27.1
252	Var3: Full variable name	Aragonite saturation state	27.2
253	Var3: Observation type	Laboratory experiment	27.4
254	Var3: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Manipulation condition	27.5
255	Var3: Variable unit	omega	27.7
256	Var3: Measured or calculated	calculated	27.8
257	Var3: Calculation method and parameters		27.9
258	Var3: Sampling instrument		27.10
259	Var3: Analyzing instrument		27.11
260	Var3: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
261	Var3: Detailed sampling and analyzing information	calculated using CO2sys program	27.13
262	Var3: Field replicate information		27.14
263	Var3: Uncertainty		27.15
264	Var3: Data quality flag description	"h2oDQ" reflects reliability of data: 1=good; 2=questionable/outlier/estimated; 3=known error.	27.16
265	Var3: Method reference (citation)		27.17
266	Var3: Biological subject (SPECIAL USE ONLY)		27.18
267	Var3: Species Identification code (SPECIAL USE ONLY)		27.19
268	Var3: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
269	Var3: Researcher Name	Natalie Monacci	27.21.1
270	Var3: Researcher Institution	Ocean Acidification Research Center at the University of Alaska at Fairbanks	27.21.2
271	Var4: Variable abbreviation in data files	H2ODQ	27.1
272	Var4: Full variable name	Data quality flag for CO2 system measures	27.2
273	Var4: Observation type	Laboratory experiment	27.4
274	Var4: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)		27.5
275	Var4: Variable unit	coded: 1=good; 2=questionable/outlier/estimated; 3=known error.	27.7
276	Var4: Measured or calculated		27.8
277	Var4: Calculation method and parameters		27.9
278	Var4: Sampling instrument		27.10
279	Var4: Analyzing instrument		27.11
280	Var4: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
281	Var4: Detailed sampling and analyzing information		27.13
282	Var4: Field replicate information		27.14
283	Var4: Uncertainty		27.15
284	Var4: Data quality flag description		27.16
285	Var4: Method reference (citation)		27.17
286	Var4: Biological subject (SPECIAL USE ONLY)		27.18
287	Var4: Species Identification code (SPECIAL USE ONLY)		27.19
288	Var4: Life stage of the Biological subject (SPECIAL USE ONLY)		27.20
289	Var4: Researcher Name	Thomas P. Hurst	27.21.1
290	Var4: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
291	Var5: Variable abbreviation in data files	NLMean	27.1
292	Var5: Full variable name	Mean notochord length	27.2
293	Var5: Observation type	Laboratory experiment	27.4

294	Var5: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
295	Var5: Variable unit	mm	27.7
296	Var5: Measured or calculated	measured	27.8
297	Var5: Calculation method and parameters		27.9
298	Var5: Sampling instrument	dissecting microscope	27.10
299	Var5: Analyzing instrument	ImagePro image analysis system	27.11
300	Var5: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
301	Var5: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs. Up to 15 fish were measured from each treatment replicate on each sampling date	27.13
302	Var5: Field replicate information		27.14
303	Var5: Uncertainty		27.15
304	Var5: Data quality flag description		27.16
305	Var5: Method reference (citation)		27.17
306	Var5: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
307	Var5: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
308	Var5: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
309	Var5: Researcher Name	Thomas P. Hurst	27.21.1
310	Var5: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
311	Var6: Variable abbreviation in data files	NLsd	27.1
312	Var6: Full variable name	Standard deviation of notochord length	27.2
313	Var6: Observation type	Laboratory experiment	27.4
314	Var6: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
315	Var6: Variable unit	mm	27.7
316	Var6: Measured or calculated	measured	27.8
317	Var6: Calculation method and parameters		27.9
318	Var6: Sampling instrument	dissecting microscope	27.10
319	Var6: Analyzing instrument	ImagePro image analysis system	27.11
320	Var6: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
321	Var6: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs. Up to 15 fish were measured from each treatment replicate on each sampling date	27.13
322	Var6: Field replicate information		27.14
323	Var6: Uncertainty		27.15
324	Var6: Data quality flag description		27.16
325	Var6: Method reference (citation)		27.17
326	Var6: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
327	Var6: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
328	Var6: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
329	Var6: Researcher Name	Thomas P. Hurst	27.21.1
330	Var6: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
331	Var7: Variable abbreviation in data files	MHmean	27.1
332	Var7: Full variable name	Mean body height (myotome height)	27.2
333	Var7: Observation type	Laboratory experiment	27.4
334	Var7: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
335	Var7: Variable unit	mm	27.7
336	Var7: Measured or calculated	measured	27.8

337	Var7: Calculation method and parameters		27.9
338	Var7: Sampling instrument	dissecting microscope	27.10
339	Var7: Analyzing instrument	ImagePro image analysis system	27.11
340	Var7: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
341	Var7: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs.	27.13
342	Var7: Field replicate information	Up to 15 fish were measured from each treatment replicate on each sampling date	27.14
343	Var7: Uncertainty		27.15
344	Var7: Data quality flag description		27.16
345	Var7: Method reference (citation)		27.17
346	Var7: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
347	Var7: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
348	Var7: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
349	Var7: Researcher Name	Thomas P. Hurst	27.21.1
350	Var7: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
351	Var8: Variable abbreviation in data files	MHsd	27.1
352	Var8: Full variable name	Standard deviation of body height (myotome height)	27.2
353	Var8: Observation type	Laboratory experiment	27.4
354	Var8: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
355	Var8: Variable unit	mm	27.7
356	Var8: Measured or calculated	measured	27.8
357	Var8: Calculation method and parameters		27.9
358	Var8: Sampling instrument	dissecting microscope	27.10
359	Var8: Analyzing instrument	ImagePro image analysis system	27.11
360	Var8: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
361	Var8: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs.	27.13
362	Var8: Field replicate information	Up to 15 fish were measured from each treatment replicate on each sampling date	27.14
363	Var8: Uncertainty		27.15
364	Var8: Data quality flag description		27.16
365	Var8: Method reference (citation)		27.17
366	Var8: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
367	Var8: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
368	Var8: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
369	Var8: Researcher Name	Thomas P. Hurst	27.21.1
370	Var8: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
371	Var9: Variable abbreviation in data files	MH_Kmean	27.1
372	Var9: Full variable name	Mean body condition - expressed as fractional deviation from from ontogenetic relationship between SL and MH	27.2
373	Var9: Observation type	Laboratory experiment	27.4
374	Var9: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
375	Var9: Variable unit	mm	27.7
376	Var9: Measured or calculated	measured	27.8
377	Var9: Calculation method and parameters		27.9
378	Var9: Sampling instrument	dissecting microscope	27.10
379	Var9: Analyzing instrument	ImagePro image analysis system	27.11

380	Var9: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
381	Var9: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs.	27.13
382	Var9: Field replicate information	Up to 15 fish were measured from each treatment replicate on each sampling date	27.14
383	Var9: Uncertainty		27.15
384	Var9: Data quality flag description		27.16
385	Var9: Method reference (citation)		27.17
386	Var9: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
387	Var9: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
388	Var9: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
389	Var9: Researcher Name	Thomas P. Hurst	27.21.1
390	Var9: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
391	Var10: Variable abbreviation in data files	MH_Ksd	27.1
392	Var10: Full variable name	standard deviation of body condition - expressed as fractional deviation from ontogenetic relationship between SL and MH	27.2
393	Var10: Observation type	Laboratory experiment	27.4
394	Var10: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
395	Var10: Variable unit	mm	27.7
396	Var10: Measured or calculated	measured	27.8
397	Var10: Calculation method and parameters		27.9
398	Var10: Sampling instrument	dissecting microscope	27.10
399	Var10: Analyzing instrument	ImagePro image analysis system	27.11
400	Var10: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
401	Var10: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs.	27.13
402	Var10: Field replicate information	Up to 15 fish were measured from each treatment replicate on each sampling date	27.14
403	Var10: Uncertainty		27.15
404	Var10: Data quality flag description		27.16
405	Var10: Method reference (citation)		27.17
406	Var10: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
407	Var10: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
408	Var10: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
409	Var10: Researcher Name	Thomas P. Hurst	27.21.1
410	Var10: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
411	Var11: Variable abbreviation in data files	FeedFrac	27.1
412	Var11: Full variable name	fraction of fish in a sample with food in stomach	27.2
413	Var11: Observation type	Laboratory experiment	27.4
414	Var11: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
415	Var11: Variable unit	none	27.7
416	Var11: Measured or calculated	calculated	27.8
417	Var11: Calculation method and parameters	fraction of fish in a sample with food in stomach	27.9
418	Var11: Sampling instrument	dissecting microscope	27.10
419	Var11: Analyzing instrument	ImagePro image analysis system	27.11
420	Var11: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12

421	Var11: Detailed sampling and analyzing information	Larvae were sampled and measured at specified intervals in the experiment. Each sampling, up to 20 larvae from each replicate tank were digitally photographed under a dissecting microscope. An image analysis system was used to measure fish from the photographs.	27.13
422	Var11: Field replicate information	Up to 15 fish were measured from each treatment replicate on each sampling date	27.14
423	Var11: Uncertainty		27.15
424	Var11: Data quality flag description		27.16
425	Var11: Method reference (citation)		27.17
426	Var11: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
427	Var11: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
428	Var11: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
429	Var11: Researcher Name	Thomas P. Hurst	27.21.1
430	Var11: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
431	Var12: Variable abbreviation in data files	Dwmean	27.1
432	Var12: Full variable name	Mean dry weight	27.2
433	Var12: Observation type	Laboratory experiment	27.4
434	Var12: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
435	Var12: Variable unit	micrograms	27.7
436	Var12: Measured or calculated	measured	27.8
437	Var12: Calculation method and parameters		27.9
438	Var12: Sampling instrument		27.10
439	Var12: Analyzing instrument	Sartorius Microbalance ME5	27.11
440	Var12: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
441	Var12: Detailed sampling and analyzing information	Fish were rinsed in ammonium formate and dried at 50°C for at least 48 hours prior to measurement	27.13
442	Var12: Field replicate information	Fish were weighed individually or in pooled samples of 5 larvae	27.14
443	Var12: Uncertainty		27.15
444	Var12: Data quality flag description		27.16
445	Var12: Method reference (citation)		27.17
446	Var12: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
447	Var12: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
448	Var12: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
449	Var12: Researcher Name	Thomas P. Hurst	27.21.1
450	Var12: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
451	Var13: Variable abbreviation in data files	DWsd	27.1
452	Var13: Full variable name	Standard deviation of individual dryweight	27.2
453	Var13: Observation type	Laboratory experiment	27.4
454	Var13: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	Laboratory experiment	27.5
455	Var13: Variable unit	response variable	27.7
456	Var13: Measured or calculated	micrograms	27.8
457	Var13: Calculation method and parameters	measured	27.9
458	Var13: Sampling instrument		27.10
459	Var13: Analyzing instrument	Sartorius Microbalance ME5	27.11
460	Var13: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
461	Var13: Detailed sampling and analyzing information	Fish were rinsed in ammonium formate and dried at 50°C for at least 48 hours prior to measurement	27.13
462	Var13: Field replicate information	Fish were weighed individually or in pooled samples of 5 larvae	27.14
463	Var13: Uncertainty		27.15

464	Var13: Data quality flag description		27.16
465	Var13: Method reference (citation)		27.17
466	Var13: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
467	Var13: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
468	Var13: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
469	Var13: Researcher Name	Thomas P. Hurst	27.21.1
470	Var13: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
471	Var14: Variable abbreviation in data files	DW_Kmean	27.1
472	Var14: Full variable name	Mean body condition - expressed as fractional deviation from from ontogenetic relationship between SL and DW	27.2
473	Var14: Observation type	Laboratory experiment	27.4
474	Var14: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
475	Var14: Variable unit	mm	27.7
476	Var14: Measured or calculated	measured	27.8
477	Var14: Calculation method and parameters		27.9
478	Var14: Sampling instrument	dissecting microscope	27.10
479	Var14: Analyzing instrument	ImagePro image analysis system	27.11
480	Var14: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
481	Var14: Detailed sampling and analyzing information	Fish were rinsed in ammonium formate and dried at 50°C for at least 48 hours prior to measurement	27.13
482	Var14: Field replicate information	Fish were weighed individually or in pooled samples of 5 larvae	27.14
483	Var14: Uncertainty		27.15
484	Var14: Data quality flag description		27.16
485	Var14: Method reference (citation)		27.17
486	Var14: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
487	Var14: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
488	Var14: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
489	Var14: Researcher Name	Thomas P. Hurst	27.21.1
490	Var14: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
491	Var15: Variable abbreviation in data files	DW_Ksd	27.1
492	Var15: Full variable name	Standard deviation body condition - expressed as fractional deviation from from ontogenetic relationship between SL and DW	27.2
493	Var15: Observation type	Laboratory experiment	27.4
494	Var15: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
495	Var15: Variable unit	mm	27.7
496	Var15: Measured or calculated	measured	27.8
497	Var15: Calculation method and parameters		27.9
498	Var15: Sampling instrument	dissecting microscope	27.10
499	Var15: Analyzing instrument	ImagePro image analysis system	27.11
500	Var15: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
501	Var15: Detailed sampling and analyzing information	Fish were rinsed in ammonium formate and dried at 50°C for at least 48 hours prior to measurement	27.13
502	Var15: Field replicate information	Fish were weighed individually or in pooled samples of 5 larvae	27.14
503	Var15: Uncertainty		27.15
504	Var15: Data quality flag description		27.16
505	Var15: Method reference (citation)		27.17
506	Var15: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18

507	Var15: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
508	Var15: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
509	Var15: Researcher Name	Thomas P. Hurst	27.21.1
510	Var15: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
511	Var16: Variable abbreviation in data files	meancell_LR	27.1
512	Var16: Full variable name	mean cell location from left (1) to right (8)	27.2
513	Var16: Observation type	Laboratory experiment	27.4
514	Var16: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
515	Var16: Variable unit	cell number	27.7
516	Var16: Measured or calculated	calculated	27.8
517	Var16: Calculation method and parameters	coded: tank cells/zones from left (1) to right (8)	27.9
518	Var16: Sampling instrument		27.10
519	Var16: Analyzing instrument		27.11
520	Var16: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
521	Var16: Detailed sampling and analyzing information	Following a 15-min acclimation period, locations were determined in 2.5 min intervals for 20 min total (i.e. light gradient shifted in the opposite direction at 10 min.)	27.13
522	Var16: Field replicate information	Fish were tested in groups of six and individual locations were averaged at 2.5 min intervals	27.14
523	Var16: Uncertainty		27.15
524	Var16: Data quality flag description		27.16
525	Var16: Method reference (citation)		27.17
526	Var16: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
527	Var16: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
528	Var16: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
529	Var16: Researcher Name	Thomas P. Hurst	27.21.1
530	Var16: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
531	Var17: Variable abbreviation in data files	meancell_relDark	27.1
532	Var17: Full variable name	mean cell location relative to the dark side of the light gradient cover	27.2
533	Var17: Observation type	Laboratory experiment	27.4
534	Var17: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
535	Var17: Variable unit	cell number	27.7
536	Var17: Measured or calculated	calculated	27.8
537	Var17: Calculation method and parameters	Average of each individual's distance (cell number) from the dark end of the light gradient	27.9
538	Var17: Sampling instrument		27.10
539	Var17: Analyzing instrument		27.11
540	Var17: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
541	Var17: Detailed sampling and analyzing information	Following a 15-min acclimation period, locations were determined in 2.5 min intervals for 20 min total (i.e. light gradient shifted in the opposite direction at 10 min.)	27.13
542	Var17: Field replicate information	Fish were tested in groups of six and individual locations were averaged at 2.5 min intervals	27.14
543	Var17: Uncertainty		27.15
544	Var17: Data quality flag description		27.16
545	Var17: Method reference (citation)		27.17
546	Var17: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
547	Var17: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
548	Var17: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20

549	Var17: Researcher Name	Thomas P. Hurst	27.21.1
550	Var17: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
551	Var18: Variable abbreviation in data files	dispersion	27.1
552	Var18: Full variable name	dispersion of fish across tank cells (or zones)	27.2
553	Var18: Observation type	Laboratory experiment	27.4
554	Var18: In-situ observation / manipulation condition / response variable (SPECIAL USE ONLY)	response variable	27.5
555	Var18: Variable unit	cell number	27.7
556	Var18: Measured or calculated	calculated	27.8
557	Var18: Calculation method and parameters	number of tank cells/zones (of 8) that were occupied by at least 1 larva (score of no more than 6)	27.9
558	Var18: Sampling instrument		27.10
559	Var18: Analyzing instrument		27.11
560	Var18: Duration (for settlement/colonization methods) (SPECIAL USE ONLY)		27.12
561	Var18: Detailed sampling and analyzing information	Following a 15-min acclimation period, locations were determined in 2.5 min intervals for 20 min total (i.e. light gradient shifted in the opposite direction at 10 min.)	27.13
562	Var18: Field replicate information	Fish were tested in groups of six and individual locations were averaged at every 2.5 min interval	27.14
563	Var18: Uncertainty		27.15
564	Var18: Data quality flag description		27.16
565	Var18: Method reference (citation)		27.17
566	Var18: Biological subject (SPECIAL USE ONLY)	Pacific cod	27.18
567	Var18: Species Identification code (SPECIAL USE ONLY)	Gadus macrocephalus	27.19
568	Var18: Life stage of the Biological subject (SPECIAL USE ONLY)	Larvae	27.20
569	Var18: Researcher Name	Thomas P. Hurst	27.21.1
570	Var18: Researcher Institution	Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration	27.21.2
571	Var19: Variable abbreviation in data files	Experiment	28.1
572	Var19: Full variable name	Experiment type, coded as "Pcod-behav" or "Pcod-grow"	28.2
573	Var20: Variable abbreviation in data files	Life_stage	28.1
574	Var20: Full variable name	Life stage of organism, coded as "broodstock" or "larvae"	28.2
575	Var21: Variable abbreviation in data files	Date	28.1
576	Var21: Full variable name	Sampling date	28.2
577	Var22: Variable abbreviation in data files	Time	28.1
578	Var22: Full variable name	Time of day of sample collection	28.2
579	Var23: Variable abbreviation in data files	Bottle_ID	28.1
580	Var23: Full variable name	Seawater sample identification	28.2
581	Var24: Variable abbreviation in data files	CO2_trt	28.1
582	Var24: Full variable name	CO2 treatment, coded	28.2
583	Var25: Variable abbreviation in data files	DPH	28.1
584	Var25: Full variable name	Days post hatch	28.2
585	Var26: Variable abbreviation in data files	Diet	28.1
586	Var26: Full variable name	Diet treatment, coded as "1" or "2"	28.2
587	Var27: Variable abbreviation in data files	tank	28.1
588	Var27: Full variable name	Laboratory rearing tank identifier	28.2
589	Var28: Variable abbreviation in data files	series	28.1
590	Var28: Full variable name	Experiment conducted twice with fish of different ages; trial 1 ~ 4 weeks old, trial 2 approx 8 weeks old	28.2
591	Var29: Variable abbreviation in data files	trial	28.1
592	Var29: Full variable name	trial	28.2
593	Var30: Variable abbreviation in data files	Obs_tank	28.1
594	Var30: Full variable name	Laboratory observation tank identifier	28.2
595	Var31: Variable abbreviation in data files	Light_orient	28.1
596	Var31: Full variable name	Orientation of the light gradient, coded as: 0 = no light gradient, 1 = dark on left side of light gradient, or 2 = dark on right side of light gradient	28.2
597	Var32: Variable abbreviation in data files	Time_sec	28.1

598	Var32: Full variable name	Time of experimental observation within experiment (s)	28.2
599	Var33: Variable abbreviation in data files	fish	28.1
600	Var33: Full variable name	number of fish with identifiable locations (no more than 6)	28.2