

No	Metadata element name	Your input	Help reference no.
1	Submission Date	3/23/2017	1
2	Accession no. of related data sets	N/A	2
3	Investigator-1 name	Andre Punt	3.1
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9	Investigator-1 ID type (ORCID, Researcher ID, etc.)	ORCID	3.7
10	Investigator-2 name	Robert Foy	3.1
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12	Investigator-2 address	301 Research Court, Kodiak AK 99615	3.3
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15	Investigator-2 researcher ID	N/A	3.6
16	Investigator-2 ID type (ORCID, Researcher ID, etc.)	N/A	3.7
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21	Investigator-3 email	michael.dalton@noaa.gov	3.5
22	Investigator-3 researcher ID	N/A	3.6
23	Investigator-3 ID type (ORCID, Researcher ID, etc.)	N/A	3.7
24	Data submitter name	Andre Punt	4.1
25	Data submitter institution	University of Washington School of Aquatic and Fishery Sciences	4.2
26	Data submitter address	1122 NE Boat Street Seattle WA 98195	4.3
27	Data submitter phone	206-221-6319	4.4
28	Data submitter email	aepunt@uw.edu	4.5
29	Data submitter researcher ID		4.6
30	Data submitter ID type (ORCID, Researcher ID, etc.)		4.7
31	Title	Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management	5
32	Abstract	Demographic models of pre- and post-recruitment population dynamics were developed to account for the effects of ocean acidification on biological parameters that affect southern Tanner crab (<i>Chionoecetes bairdi</i>) larval hatching success and larval and juvenile survival. Projections of stock biomass based on these linked models were used to calculate biological and economic reference points on which fisheries management advice is based and thus provide fisheries managers with strategic advice on the likely long-term consequences of ocean acidification. The models utilized information for southern Tanner crab in the eastern Bering Sea. This information included the monitoring data on which conventional size-structured stock assessments are based, as well as the functional relationships that determine survival based on experiments that evaluated the consequences of ocean acidification over the next 100–200 years on crab larval hatching success, larval survival, and the survival of juvenile crab. The results highlighted that juvenile survival had the largest effect (120% decrease over 75 years) on biological and economic reference points, while hatching success, particularly if density dependence occurs after hatching, and larval survival have smaller effects (10% decrease). Catch and profits would be expected to decrease by 50% in 20 years if natural mortality is affected by ocean acidification. Additional laboratory data on oocyte and embryo development leads to large changes in biological reference points depending on the timing of ocean acidification effects relative to natural mortality. The results highlight the need for experiments to evaluate the longer term physiological effects of ocean acidification on multiple life history stages and to measure indices that directly inform population dynamics models to evaluate future management scenarios.	6
33	Purpose	To Integrate biological model of population dynamics, the results of OA experiments conducted by the NMFS Kodiak Lab, and economic parameters related to costs and prices	7
34	Start date	5/1/2015	8.1
35	End date	5/31/2015	8.2

36	Westbd longitude	172	9.1
37	Eastbd longitude	-157	9.2
38	Northbd latitude	58	9.3
39	Southbd latitude	54	9.4
40	Spatial reference system	N/A	10
41	Geographic names	Eastern Bering Sea	11
42	Location of organism collection	On fishery vessels	12
43	Funding agency name	NOAA's Ocean Acidification Program	13.1
44	Funding project title	Forecast effects of ocean acidification on Alaska crab abundance	13.2
45	Funding project ID (Grant no.)	OAPFY13.03.AFSC.002	13.3
46	Research projects	none	14
47	Platform-1 name	N/A - Modelling study	15.1
48	Platform-1 ID		15.2
49	Platform-1 type		15.3
50	Platform-1 owner		15.4
51	Platform-1 country		15.5
52	EXPOCODE	N/A - Modelling study	16
53	Cruise ID		17
54	Section		18
55	Author list for citation		19
56	References		20
57	Supplemental information		21
58	DIC: Variable abbreviation in data files	N/A	22.1
59	DIC: Observation type		22.2
60	DIC: In-situ observation / manipulation condition / response variable		22.3
61	DIC: Manipulation method		22.4
62	DIC: Variable unit		22.5
63	DIC: Measured or calculated		22.6
64	DIC: Calculation method and parameters		22.7
65	DIC: Sampling instrument		22.8
66	DIC: Analyzing instrument		22.9
67	DIC: Detailed sampling and analyzing information		22.10
68	DIC: Field replicate information		22.11
69	DIC: Standardization technique description		22.12.1
70	DIC: Frequency of standardization		22.12.2
71	DIC: CRM manufacturer		22.12.3.1
72	DIC: Batch number		22.12.3.2
73	DIC: Poison used to kill the sample		22.13.1
74	DIC: Poison volume		22.13.2
75	DIC Poisoning correction description		22.13.3
76	DIC: Uncertainty		22.14
77	DIC: Data quality flag description		22.15
78	DIC: Method reference (citation)		22.16
79	DIC: Researcher Name		22.17.1
80	DIC: Researcher Institution		22.17.2
81	TA: Variable abbreviation in data files	N/A	23.1
82	TA: Observation type		23.2
83	TA: In-situ observation / manipulation condition / response variable		23.3
84	TA: Manipulation method		23.4
85	TA: Variable unit		23.5
86	TA: Measured or calculated		23.6

87	TA: Calculation method and parameters	23.7
88	TA: Sampling instrument	23.8
89	TA: Analyzing instrument	23.9
90	TA: Type of titration	23.10
91	TA: Cell type (open or closed)	23.11
92	TA: Curve fitting method	23.12
93	TA: Detailed sampling and analyzing information	23.13
94	TA: Field replicate information	23.14
95	TA: Standardization technique description	23.15.1
96	TA: Frequency of standardization	23.15.2
97	TA: CRM manufacturer	23.15.3.1
98	TA: Batch Number	23.15.3.2
99	TA: Poison used to kill the sample	23.16.1
100	TA: Poison volume	23.16.2
101	TA: Poisoning correction description	23.16.3
102	TA: Magnitude of blank correction	23.17
103	TA: Uncertainty	23.18
104	TA: Data quality flag description	23.19
105	TA: Method reference (citation)	23.20
106	TA: Researcher Name	23.21.1
107	TA: Researcher Institution	23.21.2
108	pH: Variable abbreviation in data files N/A	24.1
109	pH: Observation type	24.2
110	pH: In-situ observation / manipulation condition / response variable	24.3
111	pH: Manipulation method	24.4
112	pH: Measured or calculated	24.5
113	pH: Calculation method and parameters	24.6
114	pH: Sampling instrument	24.7
115	pH: Analyzing instrument	24.8
116	pH: pH scale	24.9
117	pH: Temperature of measurement	24.10
118	pH: Detailed sampling and analyzing information	24.11
119	pH: Field replicate information	24.12
120	pH: Standardization technique description	24.13.1
121	pH: Frequency of standardization	24.13.2
122	pH: pH values of the standards	24.13.3
123	pH: Temperature of standardization	24.13.4
124	pH: Temperature correction method	24.14
125	pH: at what temperature was pH reported	24.15
126	pH: Uncertainty	24.16
127	pH: Data quality flag description	24.17
128	pH: Method reference (citation)	24.18
129	pH: Researcher Name	24.19.1
130	pH: Researcher Institution	24.19.2
131	pCO2A: Variable abbreviation in data files N/A	25.1
132	pCO2A: Observation type	25.2
133	pCO2A: In-situ observation / manipulation condition / response variable	25.3
134	pCO2A: Manipulation method	25.4
135	pCO2A: Variable unit	25.5
136	pCO2A: Measured or calculated	25.6

137	pCO2A: Calculation method and parameters	25.7
138	pCO2A: Sampling instrument	25.8
139	pCO2A: Location of seawater intake	25.9
140	pCO2A: Depth of seawater intake	25.10
141	pCO2A: Analyzing instrument	25.11
142	pCO2A: Detailed sampling and analyzing information	25.12
143	pCO2A: Equilibrator type	25.13.1
144	pCO2A: Equilibrator volume (L)	25.13.2
145	pCO2A: Vented or not	25.13.3
146	pCO2A: Water flow rate (L/min)	25.13.4
147	pCO2A: Headspace gas flow rate (L/min)	25.13.5
148	pCO2A: How was temperature inside the equilibrator measured .	25.13.6
149	pCO2A: How was pressure inside the equilibrator measured.	25.13.7
150	pCO2A: Drying method for CO2 gas	25.14
151	pCO2A: Manufacturer of the gas detector	25.15.1
152	pCO2A: Model of the gas detector	25.15.2
153	pCO2A: Resolution of the gas detector	25.15.3
154	pCO2A: Uncertainty of the gas detector	25.15.4
155	pCO2A: Standardization technique description	25.16.1
156	pCO2A: Frequency of standardization	25.16.2
157	pCO2A: Manufacturer of standard gas	25.16.3.1
158	pCO2A: Concentrations of standard gas	25.16.3.2
159	pCO2A: Uncertainties of standard gas	25.16.3.3
160	pCO2A: Water vapor correction method	25.17
161	pCO2A: Temperature correction method	25.18
162	pCO2A: at what temperature was pCO2 reported	25.19
163	pCO2A: Uncertainty	25.20
164	pCO2A: Data quality flag description	25.21
165	pCO2A: Method reference (citation)	25.22
166	pCO2A: Researcher Name	25.23.1
167	pCO2A: Researcher Institution	25.23.2
168	pCO2D: Variable abbreviation in data files N/A	26.1
169	pCO2D: Observation type	26.2
170	pCO2D: In-situ observation / manipulation condition / response variable	26.3
171	pCO2D: Manipulation method	26.4
172	pCO2D: Variable unit	26.5
173	pCO2D: Measured or calculated	26.6
174	pCO2D: Calculation method and parameters	26.7
175	pCO2D: Sampling instrument	26.8
176	pCO2D: Analyzing instrument	26.9
177	pCO2D: Storage method	26.10
178	pCO2D: Seawater volume (mL)	26.11
179	pCO2D: Headspace volume (mL)	26.12
180	pCO2D: Temperature of measurement	26.13
181	pCO2D: Detailed sampling and analyzing information	26.14
182	pCO2D: Field replicate information	26.15
183	pCO2D: Manufacturer of the gas detector	26.16.1
184	pCO2D: Model of the gas detector	26.16.2
185	pCO2D: Resolution of the gas detector	26.16.3
186	pCO2D: Uncertainty of the gas detector	26.16.4

187	pCO2D: Standardization technique description		26.17.1
188	pCO2D: Frequency of standardization		26.17.2
189	pCO2D: Temperature of standardization		26.17.3
190	pCO2D: Manufacturer of standard gas		26.17.4.1
191	pCO2D: Concentrations of standard gas		26.17.4.2
192	pCO2D: Uncertainties of standard gas		26.17.4.3
193	pCO2D: Water vapor correction method		26.18
194	pCO2D: Temperature correction method		26.19
195	pCO2D: at what temperature was pCO2 reported		26.20
196	pCO2D: Uncertainty		26.21
197	pCO2D: Data quality flag description		26.22
198	pCO2D: Method reference (citation)		26.23
199	pCO2D: Researcher Name		26.24.1
200	pCO2D: Researcher Institution		26.24.2
201	Var1: Variable abbreviation in data files	"year" (FIG7A.csv pertains to the situation where OA impacts post-recruitment survival; FIG7B.csv pertains to the situation where this is not the case)	27.1
202	Var1: Full variable name	Years From Present	27.2
203	Var1: Observation type		27.4
204	Var1: In-situ observation / manipulation condition / response variable		27.5
205	Var1: Variable unit		27.7
206	Var1: Measured or calculated		27.8
207	Var1: Calculation method and parameters		27.9
208	Var1: Sampling instrument		27.10
209	Var1: Analyzing instrument		27.11
210	Var1: Duration (for settlement/colonization methods)		27.12
211	Var1: Detailed sampling and analyzing information		27.13
212	Var1: Field replicate information		27.14
213	Var1: Uncertainty		27.15
214	Var1: Data quality flag description		27.16
215	Var1: Method reference (citation)		27.17
216	Var1: Biological subject		27.18
217	Var1: Species Identification code		27.19
218	Var1: Life stage of the biological subject		27.20
219	Var1: Researcher Name		27.21.1
220	Var1: Researcher Institution		27.21.2
221	Var2: Variable abbreviation in data files	"Fmsy"	27.1
222	Var2: Full variable name	Fishing mortality corresponding to Maximum Sustainable Yield	27.2
223	Var2: Observation type	Model Output	27.4
224	Var2: In-situ observation / manipulation condition / response variable	Response variable	27.5
225	Var2: Variable unit	Years^-1	27.7
226	Var2: Measured or calculated	Calculated	27.8
227	Var2: Calculation method and parameters	Model	27.9
228	Var2: Sampling instrument		27.10
229	Var2: Analyzing instrument		27.11
230	Var2: Duration (for settlement/colonization methods)		27.12
231	Var2: Detailed sampling and analyzing information		27.13
232	Var2: Field replicate information		27.14
233	Var2: Uncertainty		27.15
234	Var2: Data quality flag description		27.16

235	Var2: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
236	Var2: Biological subject	<i>Chionoecetes bairdi</i> Rathbun, 1924	27.18
237	Var2: Species Identification code	98429	27.19
238	Var2: Life stage of the biological subject	Based on all life stages	27.20
239	Var2: Researcher Name	Andre Punt	27.21.1
240	Var2: Researcher Institution	University of Washington	27.21.2
241	Var3: Variable abbreviation in data files	"Fmey"	27.1
242	Var3: Full variable name	Fishing mortality corresponding to Maximum Economic Yield	27.2
243	Var3: Observation type	Model Output	27.4
244	Var3: In-situ observation / manipulation condition / response variable	Response variable	27.5
245	Var3: Variable unit	Years ⁻¹	27.7
246	Var3: Measured or calculated	Calculated	27.8
247	Var3: Calculation method and parameters		27.9
248	Var3: Sampling instrument		27.10
249	Var3: Analyzing instrument		27.11
250	Var3: Duration (for settlement/colonization methods)		27.12
251	Var3: Detailed sampling and analyzing information		27.13
252	Var3: Field replicate information		27.14
253	Var3: Uncertainty		27.15
254	Var3: Data quality flag description		27.16
255	Var3: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
256	Var3: Biological subject	<i>Chionoecetes bairdi</i> Rathbun, 1924	27.18
257	Var3: Species Identification code	98429	27.19
258	Var3: Life stage of the biological subject	Based on all life stages	27.20
259	Var3: Researcher Name	Andre Punt	27.21.1
260	Var3: Researcher Institution	University of Washington	27.21.2
261	Var4: Variable abbreviation in data files	"MSY"	27.1
262	Var4: Full variable name	Maximum Sustainable Yield	27.2
263	Var4: Observation type	Model Output	27.4
264	Var4: In-situ observation / manipulation condition / response variable	Response variable	27.5
265	Var4: Variable unit	000 tonnes	27.7
266	Var4: Measured or calculated	Calculated	27.8
267	Var4: Calculation method and parameters		27.9
268	Var4: Sampling instrument		27.10
269	Var4: Analyzing instrument		27.11
270	Var4: Duration (for settlement/colonization methods)		27.12
271	Var4: Detailed sampling and analyzing information		27.13
272	Var4: Field replicate information		27.14
273	Var4: Uncertainty		27.15
274	Var4: Data quality flag description		27.16
275	Var4: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
276	Var4: Biological subject	<i>Chionoecetes bairdi</i> Rathbun, 1924	27.18
277	Var4: Species Identification code	98429	27.19

278	Var4: Life stage of the biological subject	Based on all life stages	27.20
279	Var4: Researcher Name	Andre Punt	27.21.1
280	Var4: Researcher Institution	University of Washington	27.21.2
281	Var5: Variable abbreviation in data files	"MEY"	27.1
282	Var5: Full variable name	Maximum Economic Yield	27.2
283	Var5: Observation type	Model Output	27.4
284	Var5: In-situ observation / manipulation condition / response variable	Response variable	27.5
285	Var5: Variable unit	Millions of US \$	27.7
286	Var5: Measured or calculated	Calculated	27.8
287	Var5: Calculation method and parameters		27.9
288	Var5: Sampling instrument		27.10
289	Var5: Analyzing instrument		27.11
290	Var5: Duration (for settlement/colonization methods)		27.12
291	Var5: Detailed sampling and analyzing information		27.13
292	Var5: Field replicate information		27.14
293	Var5: Uncertainty		27.15
294	Var5: Data quality flag description		27.16
295	Var5: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
296	Var5: Biological subject	<i>Chionoecetes bairdi</i> Rathbun, 1924	27.18
297	Var5: Species Identification code	98429	27.19
298	Var5: Life stage of the biological subject	Based on all life stages	27.20
299	Var5: Researcher Name	Andre Punt	27.21.1
300	Var5: Researcher Institution	University of Washington	27.21.2
301	Var6: Variable abbreviation in data files	"Bmsy/B0"	27.1
302	Var6: Full variable name	Mature male biomass at which Maximum Sustainable Yield occurs relative to unfished mature male biomass	27.2
303	Var6: Observation type	Model Output	27.4
304	Var6: In-situ observation / manipulation condition / response variable	Response variable	27.5
305	Var6: Variable unit	Unitless	27.7
306	Var6: Measured or calculated	Calculated	27.8
307	Var6: Calculation method and parameters		27.9
308	Var6: Sampling instrument		27.10
309	Var6: Analyzing instrument		27.11
310	Var6: Duration (for settlement/colonization methods)		27.12
311	Var6: Detailed sampling and analyzing information		27.13
312	Var6: Field replicate information		27.14
313	Var6: Uncertainty		27.15
314	Var6: Data quality flag description		27.16
315	Var6: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
316	Var6: Biological subject	<i>Chionoecetes bairdi</i> Rathbun, 1924	27.18
317	Var6: Species Identification code	98429	27.19
318	Var6: Life stage of the biological subject	Based on all life stages	27.20
319	Var6: Researcher Name	Andre Punt	27.21.1
320	Var6: Researcher Institution	University of Washington	27.21.2
321	Var7: Variable abbreviation in data files	"Bmey/B0"	27.1
322	Var7: Full variable name	Mature male biomass at which Maximum Economic Yield occurs relative to unfished mature male biomass	27.2

323	Var7: Observation type	Model Output	27.4
324	Var7: In-situ observation / manipulation condition / response variable	Response variable	27.5
325	Var7: Variable unit	Unitless	27.7
326	Var7: Measured or calculated	Calculated	27.8
327	Var7: Calculation method and parameters		27.9
328	Var7: Sampling instrument		27.10
329	Var7: Analyzing instrument		27.11
330	Var7: Duration (for settlement/colonization methods)		27.12
331	Var7: Detailed sampling and analyzing information		27.13
332	Var7: Field replicate information		27.14
333	Var7: Uncertainty		27.15
334	Var7: Data quality flag description		27.16
335	Var7: Method reference (citation)		27.17
336	Var7: Biological subject	Chionoecetes bairdi Rathbun, 1924	27.18
337	Var7: Species Identification code	98429	27.19
338	Var7: Life stage of the biological subject	Based on all life stages	27.20
339	Var7: Researcher Name	Andre Punt	27.21.1
340	Var7: Researcher Institution	University of Washington	27.21.2
341	Var8: Variable abbreviation in data files	"F35%"	27.1
342	Var8: Full variable name	Fishing mortality corresponding to a spawning biomass-per-recruit of 0.35	27.2
343	Var8: Observation type	Model Output	27.4
344	Var8: In-situ observation / manipulation condition / response variable	Response variable	27.5
345	Var8: Variable unit	year^-1	27.7
346	Var8: Measured or calculated	Calculated	27.8
347	Var8: Calculation method and parameters		27.9
348	Var8: Sampling instrument		27.10
349	Var8: Analyzing instrument		27.11
350	Var8: Duration (for settlement/colonization methods)		27.12
351	Var8: Detailed sampling and analyzing information		27.13
352	Var8: Field replicate information		27.14
353	Var8: Uncertainty		27.15
354	Var8: Data quality flag description		27.16
355	Var8: Method reference (citation)	Punt, AE, Foy, RJ, Dalton, MG, Long, CW, Swiney, KM. 2016. Effects of long-term exposure to ocean acidification conditions on future southern Tanner crab (<i>Chionoecetes bairdi</i>) fisheries management. ICES J. Mar. Sci. 73: 849-864, doi:10.1093/icesjms/fsv205	27.17
356	Var8: Biological subject	Chionoecetes bairdi Rathbun, 1924	27.18
357	Var8: Species Identification code	98429	27.19
358	Var8: Life stage of the biological subject	Based on all life stages	27.20
359	Var8: Researcher Name	Andre Punt	27.21.1
360	Var8: Researcher Institution	University of Washington	27.21.2