

Available data for the assessment of the South African chokka squid (*Loligo reynaudii*) resource

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ABSTRACT

A summary of the data currently available for chokka squid to be used in the assessment model fitting process is provided.

KEYWORDS: Data, pack category data, sex-disaggregated, squid

INTRODUCTION

This paper provides the data currently available for squid to be used in the fitting process for the assessment model.

DATA

The decision has been taken to restrict the data to 2009 onwards as this is the period for which reliable pack data are available. Table 1 provides monthly catches of squid (in tonnes) by the jig fishery for fishing years 2009 to 2024, where a fishing year is defined as the period from May of year y to April of year $y + 1$. Table 2 gives the monthly catches for the trawl fishery, with catches from the South and from the West coasts being combined. Extraction of the trawl catches from the end of fishing years 2023 to 2024 still needs to be done.

Table 3 gives the jig CPUE indices, disaggregated by month and by pack size category. Jig CPUE indices for the period 2021 to 2024 are not available yet. Trawl CPUE indices are also not available yet. Survey abundance indices together with their CVs are given in Table 4. These were restricted to the summer survey off the South coast and the autumn survey off the West coast.

Commercial size-composition data for squid are currently available only for four different pack categories, which are sex-aggregated. Initial information to obtain sex-disaggregated proportions in the pack data has recently become available. These data are described in full below. Figure 1 shows the distribution of the jig fishery catches over the period 2017 to 2023. Figure 2 shows the distribution of squid as sampled from fishery-independent demersal surveys. Survey size-composition data were not available in time to include in this summary.

Pack data

Monthly proportions by weight are available for each pack data category for the 2009 to 2015 and 2017 to 2024 fishing years. The pack data are categorised in terms of the following mantle lengths:

- Small: 150-180 mm ML
- Medium: 180-250 mm ML
- Large: 250-300 mm ML
- X Large: > 300 mm ML.

Table 5 gives the proportion in each pack category by month for all fishing years for which this is available.

Sex-disaggregated pack data

In June 2024 and November 2024, an initial exercise was undertaken to sample squid to determine the proportion of males and females in each pack category. Sampling was carried out on two vessels in June and on three vessels in November. Table 6 provides a summary for the squid sampled by pack category, and the observed proportion of males in each category.

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Table 2. Monthly catches of squid (in tonnes) by the jig fishery to be used in the squid assessment. Fishing years are defined as the period from May of the indicated year y to April of year $y + 1$. Dashes represent months where a closed season applied for the fishery.

Fishing year	Month											
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2009	400.0	768.9	941.3	169.7	272.6	703.0	853.1	2793.5	1776.9	685.0	667.8	521.8
2010	308.3	573.6	743.1	454.4	675.7	946.5	1113.6	1964.3	1409.4	838.7	954.4	394.8
2011	755.3	377.3	271.5	368.6	312.4	715.8	339.3	1484.0	879.8	545.4	333.6	157.9
2012	66.1	95.5	143.7	274.2	1105.0	416.7	1239.3	900.5	244.2	83.5	57.1	54.7
2013	151.3	154.2	237.2	180.1	75.7	317.6	196.6	895.0	834.1	47.5	8.6	—
2014	—	—	735.8	607.6	499.1	601.6	1583.3	2150.4	1363.0	837.0	—	—
2015	—	255.0	354.3	162.1	134.2	563.9	805.3	2134.8	1789.3	477.1	269.5	—
2016	—	—	293.2	540.4	1391.2	1633.2	865.7	2047.2	1572.8	1094.3	359.2	—
2017	—	—	1104.7	107.2	427.3	1631.7	2247.7	4097.4	2214.4	931.7	959.1	—
2018	—	—	1802.6	1378.3	1567.9	680.9	979.2	2030.0	1426.1	869.3	1109.4	—
2019	—	—	85.7	238.9	885.2	915.7	280.6	975.0	1043.2	336.0	231.5	—
2020	—	—	276.5	162.7	463.1	514.4	509.0	656.6	1036.5	340.7	228.2	—
2021	—	—	175.9	98.0	249.8	244.3	339.4	483.1	406.7	277.9	163.3	239.0
2022	—	—	628.8	437.2	1166.1	708.6	490.9	1051.2	541.5	291.0	390.5	85.4
2023	—	—	199.5	56.9	199.5	159.0	123.5	310.0	386.6	546.5	1021.4	2884.3
2024	—	—	1822.8	171.8	958.0	662.3	494.2	1057.8	707.4	249.3	484.3	374.9

Table 2. Monthly catches of squid (in tonnes) by the trawl fishery to be used in the squid assessment. Catches from the South and the West coast have been combined. Fishing years are defined as the period from May of the indicated year y to April of year $y + 1$. Blanks represent where these data are not yet available.

Fishing year	Month											
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2009	48.27	33.83	14.67	15.52	16.25	34.68	32.75	66.65	50.59	57.86	102.36	48.73
2010	17.93	14.55	20.20	21.68	48.88	41.31	45.83	40.42	76.90	70.12	71.30	43.58
2011	24.31	18.17	13.32	9.26	14.97	14.95	23.67	9.47	21.75	9.06	12.03	8.47
2012	4.19	3.90	6.51	7.33	7.84	19.19	15.41	6.27	5.78	2.45	2.80	2.64
2013	3.63	5.32	3.24	1.93	2.22	6.20	4.09	7.06	20.64	22.59	16.59	11.52
2014	5.45	8.13	7.60	9.28	15.91	13.91	17.83	32.90	22.46	28.08	17.62	5.77
2015	1.85	1.94	2.81	11.18	6.63	14.39	22.34	198.28	139.35	67.22	52.34	24.07
2016	12.13	16.26	26.60	10.02	28.51	28.59	57.51	83.86	34.47	43.57	26.89	36.63
2017	20.65	7.92	8.84	27.24	44.20	33.42	53.87	135.50	89.78	93.62	95.89	66.48
2018	19.13	11.54	10.53	17.85	27.76	24.90	46.61	16.51	77.28	42.35	37.56	43.57
2019	20.20	8.19	5.20	5.83	38.28	67.79	95.53	39.02	36.45	33.26	57.27	76.40
2020	28.12	28.13	28.52	38.71	91.39	84.71	109.62	59.85	51.52	22.94	31.91	31.83
2021	14.22	10.85	11.29	9.91	14.33	43.13	39.09	57.72	36.42	16.88	29.97	120.50
2022	49.27	20.86	13.03	17.32	19.51	37.01	52.65	28.57	101.75	72.44	46.56	104.00
2023	44.93	14.23	7.32	23.38	15.18	43.35	64.36	53.05				
2024												

Table 3. CPUE indices of relative abundance for chokka squid by month and by pack category size provided by the nominal commercial CPUE series (kg/person-day) for the jig fishery. Fishing years are defined as the period from May of the indicated year y to April of year $y + 1$. Dashes represent months when the season was closed for the fishery or where no data are available. Data for 2021 to 2024 are not yet available; those years have been omitted from the Table.

Fishing year	Pack size	Month											
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2009	S	2.22	3.72	5.18	0.13	3.20	9.18	0.90	13.68	16.92	6.98	2.73	2.90
	M	8.92	12.44	16.76	0.39	6.98	11.40	0.90	11.56	12.85	9.98	6.55	8.46
	L	2.11	3.21	3.95	0.10	1.64	4.15	1.31	14.35	11.89	5.07	3.11	2.64
	XL	3.98	6.00	7.40	0.07	1.98	5.38	1.85	12.03	13.30	9.04	5.70	6.09
2010	S	2.84	7.23	7.43	7.93	6.73	12.58	1.63	13.44	7.89	6.08	4.37	2.95
	M	5.65	7.56	4.48	5.48	5.87	12.35	2.01	14.13	7.73	8.87	8.46	9.54
	L	1.74	2.89	3.17	3.03	2.94	7.07	1.64	11.70	5.73	3.72	3.96	2.79
	XL	3.21	2.01	2.03	2.00	2.81	10.48	2.36	14.41	6.49	4.60	4.54	4.44
2011	S	1.19	1.65	2.19	2.17	2.77	5.12	0.08	5.59	4.65	1.39	1.29	1.21
	M	10.39	11.01	7.81	5.27	5.96	12.38	0.38	10.70	10.61	7.93	7.31	10.95
	L	2.08	1.83	0.88	1.10	1.26	3.31	0.25	4.17	4.37	2.94	1.74	2.13
	XL	4.96	4.86	2.03	1.35	1.75	5.94	0.78	5.57	5.14	3.63	3.04	5.44
2012	S	1.27	2.58	2.67	5.12	6.26	9.96	0.49	5.97	2.16	0.84	1.42	1.41
	M	5.84	4.07	2.04	2.79	5.99	11.14	2.62	16.84	7.09	5.28	5.15	3.34
	L	0.98	1.04	1.23	2.45	4.60	7.11	0.97	6.94	2.91	1.31	1.07	1.05
	XL	1.95	1.32	0.71	1.12	4.23	8.68	3.06	13.90	5.38	3.31	2.26	1.19
2013	S	1.91	1.26	1.80	1.23	0.67	0.50	0.01	0.98	1.80	0.55	0.77	—
	M	4.84	3.46	4.84	4.23	2.63	6.97	0.49	7.25	13.64	5.94	7.56	—
	L	1.31	0.96	1.30	0.88	0.85	1.71	0.17	2.33	4.63	1.66	2.83	—
	XL	1.80	1.32	1.97	1.72	1.63	4.88	0.77	4.38	10.19	3.48	6.61	—
2014	S	—	—	3.93	5.38	2.47	—	0.21	2.78	4.28	2.75	—	—
	M	—	—	5.77	6.47	4.82	—	0.27	6.48	14.54	14.99	—	—
	L	—	—	2.62	2.95	2.30	—	0.19	4.40	9.28	5.96	—	—
	XL	—	—	2.08	3.16	3.45	—	0.29	6.64	15.53	15.39	—	—

Table 3. cont.

2015	S	—	2.08	3.41	3.95	2.31	4.59	0.29	8.53	8.93	6.88	2.37	—
	M	—	3.24	5.67	5.16	3.15	7.06	0.30	14.79	14.15	14.03	8.73	—
	L	—	1.17	1.65	1.35	0.90	5.80	0.67	11.34	9.93	6.49	3.03	—
	XL	—	1.70	2.41	1.31	1.08	6.16	1.24	14.49	14.63	13.96	6.08	—
2016	S	—	—	—	—	—	—	—	—	—	—	—	—
	M	—	—	—	—	—	—	—	—	—	—	—	—
	L	—	—	—	—	—	—	—	—	—	—	—	—
	XL	—	—	—	—	—	—	—	—	—	—	—	—
2017	S	—	—	0.26	—	—	0.41	8.07	27.91	31.40	16.20	14.09	—
	M	—	—	0.18	—	—	0.33	10.73	14.53	15.70	6.62	7.90	—
	L	—	—	0.14	—	—	0.34	15.83	22.90	33.08	9.65	7.83	—
	XL	—	—	0.04	—	—	0.17	7.24	9.06	26.80	10.91	13.71	—
2018	S	—	—	15.09	16.90	15.72	12.99	0.95	16.24	14.05	11.55	10.31	—
	M	—	—	6.33	5.72	8.59	7.07	0.86	11.76	8.89	6.28	5.54	—
	L	—	—	6.04	6.83	10.73	8.08	1.22	12.53	9.54	6.33	4.11	—
	XL	—	—	4.94	4.37	7.95	5.41	1.13	6.99	8.20	9.46	9.18	—
2019	S	—	—	2.57	4.88	5.97	14.57	0.08	4.39	19.02	4.78	7.60	—
	M	—	—	0.98	2.65	4.39	9.27	0.21	3.00	7.08	1.92	5.20	—
	L	—	—	0.81	2.03	3.57	6.86	0.72	3.32	8.18	2.89	3.10	—
	XL	—	—	0.19	1.26	2.19	4.24	0.27	2.77	8.90	3.36	10.90	—
2020	S	—	—	3.96	3.44	4.33	25.84	2.44	18.96	18.82	6.97	4.42	—
	M	—	—	1.38	2.07	1.98	11.95	1.12	8.27	7.24	3.19	2.55	—
	L	—	—	1.45	2.54	2.03	12.47	1.84	11.52	8.76	3.66	2.33	—
	XL	—	—	0.83	1.98	1.57	9.61	2.06	11.31	10.04	4.39	4.46	—

Table 4. Abundance indices for squid together with CVs obtained from surveys off the West and South coasts of South Africa. Fishing years are defined as the period from May of the indicated year y to April of year $y + 1$.

Fishing year	West coast (Summer)		South coast (Autumn)	
	Biomass (tonnes)	CV	Biomass (tonnes)	CV
2009	10 810.2	0.288	16 082.9	0.135
2010	8 154.2	0.269	25 612.7	0.135
2011	1 323.4	0.278	—	—
2012	337.8	0.631	—	—
2013	1 116.3	0.424	15 595.5	0.100
2014	1 207.0	0.320	12 453.3	0.146
2015	3 863.4	0.291	24 066.2	0.167
2016	6 787.3	0.293	—	—
2017	—	—	—	—
2018	8 807.2	0.306	24 421.9	0.108
2019	6 838.0	0.334	—	—
2020	—	—	20599.8	0.101
2021	1745.7	0.336	—	—
2022	4978.9	0.297	25179.7	0.108
2023	11658.0	0.323	71784.0	0.155
2024	—	—	—	—

Table 5. Observed proportions of the catch by weight in each month for each pack category.

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Small pack: 150-180 mm ML												
2009	0.129	0.147	0.156	0.185	0.232	0.305	0.182	0.265	0.308	0.225	0.151	0.144
2010	0.211	0.367	0.434	0.430	0.367	0.296	0.213	0.250	0.283	0.261	0.205	0.150
2011	0.064	0.085	0.170	0.219	0.236	0.191	0.053	0.215	0.188	0.087	0.097	0.061
2012	0.126	0.286	0.401	0.446	0.297	0.270	0.069	0.137	0.123	0.078	0.143	0.202
2013	0.194	0.180	0.182	0.152	0.115	0.036	0.009	0.066	0.060	0.047	0.043	—
2014	—	—	0.273	0.300	0.189	0.000	0.219	0.137	0.098	0.070	—	—
2015	—	0.254	0.259	0.336	0.311	0.194	0.118	0.173	0.187	0.166	0.117	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017	—	—	0.423	—	0.435	0.329	0.193	0.375	0.293	0.373	0.324	—
2018	—	—	0.466	0.500	0.366	0.387	0.228	0.342	0.345	0.343	0.354	—
2019	—	—	0.563	0.451	0.370	0.417	0.060	0.326	0.441	0.369	0.284	—
2020	—	—	0.520	0.343	0.437	0.432	0.328	0.379	0.452	0.376	0.327	—
2021	—	—	0.384	0.244	0.388	0.349	0.253	0.337	0.353	0.390	0.346	0.285
2022	—	—	0.468	0.501	0.397	0.311	0.105	0.338	0.386	0.328	0.277	0.279
2023	—	—	0.512	0.272	0.245	0.278	0.128	0.283	0.243	0.279	0.406	0.416
2024	—	—	0.363	0.371	0.271	0.328	0.145	0.264	0.320	0.291	0.183	0.151

Table 5 cont.

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Medium pack: 180-250 mm ML												
2009	0.518	0.490	0.504	0.570	0.505	0.379	0.182	0.224	0.234	0.321	0.362	0.421
2010	0.420	0.384	0.262	0.297	0.320	0.291	0.263	0.263	0.278	0.381	0.397	0.484
2011	0.558	0.569	0.605	0.532	0.508	0.463	0.257	0.411	0.428	0.499	0.546	0.555
2012	0.582	0.452	0.307	0.243	0.284	0.302	0.367	0.386	0.404	0.492	0.520	0.477
2013	0.491	0.494	0.489	0.525	0.455	0.496	0.339	0.485	0.451	0.510	0.425	—
2014	—	—	0.401	0.360	0.370	0.000	0.285	0.319	0.333	0.383	—	—
2015	—	0.396	0.431	0.438	0.423	0.299	0.119	0.301	0.297	0.339	0.432	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017	—	—	0.291	—	0.094	0.263	0.256	0.195	0.147	0.153	0.182	—
2018	—	—	0.195	0.169	0.200	0.211	0.207	0.247	0.219	0.187	0.190	—
2019	—	—	0.216	0.245	0.272	0.265	0.162	0.223	0.164	0.149	0.194	—
2020	—	—	0.181	0.206	0.200	0.200	0.150	0.165	0.155	0.174	0.190	—
2021	—	—	0.184	0.258	0.217	0.191	0.166	0.160	0.173	0.161	0.247	0.261
2022	—	—	0.164	0.216	0.192	0.222	0.139	0.167	0.173	0.212	0.221	0.272
2023	—	—	0.208	0.224	0.194	0.166	0.112	0.166	0.201	0.249	0.292	0.259
2024	—	—	0.186	0.205	0.222	0.268	0.192	0.204	0.190	0.221	0.276	0.302

Table 5 cont.

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Large pack: 250-300 mm ML												
2009	0.123	0.126	0.119	0.143	0.119	0.138	0.264	0.278	0.216	0.163	0.172	0.132
2010	0.129	0.147	0.185	0.164	0.160	0.166	0.215	0.218	0.206	0.160	0.186	0.142
2011	0.111	0.094	0.068	0.111	0.107	0.124	0.169	0.160	0.176	0.185	0.130	0.108
2012	0.098	0.116	0.185	0.214	0.218	0.193	0.135	0.159	0.166	0.122	0.108	0.150
2013	0.133	0.136	0.131	0.109	0.147	0.121	0.118	0.156	0.153	0.143	0.159	0.000
2014	—	—	0.182	0.164	0.177	0.000	0.197	0.217	0.213	0.153	0.000	—
2015	—	0.143	0.126	0.115	0.121	0.246	0.270	0.231	0.209	0.157	0.150	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017	—	—	0.222	—	0.381	0.270	0.378	0.308	0.309	0.222	0.180	—
2018	—	—	0.186	0.202	0.250	0.241	0.293	0.264	0.235	0.188	0.141	—
2019	—	—	0.178	0.188	0.221	0.196	0.568	0.246	0.189	0.223	0.116	—
2020	—	—	0.191	0.253	0.205	0.208	0.246	0.230	0.183	0.203	0.168	—
2021	—	—	0.234	0.301	0.217	0.238	0.254	0.209	0.194	0.164	0.122	0.120
2022	—	—	0.207	0.195	0.228	0.284	0.357	0.234	0.191	0.163	0.138	0.165
2023	—	—	0.199	0.298	0.284	0.264	0.336	0.235	0.184	0.113	0.074	0.157
2024	—	—	0.238	0.278	0.285	0.240	0.369	0.309	0.211	0.186	0.123	0.118

Table 5 cont.

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
X large pack: >300 mm ML												
2009	0.231	0.236	0.222	0.102	0.144	0.179	0.373	0.233	0.242	0.291	0.315	0.303
2010	0.239	0.102	0.119	0.108	0.153	0.247	0.309	0.268	0.233	0.198	0.213	0.225
2011	0.267	0.251	0.157	0.137	0.149	0.222	0.520	0.214	0.207	0.228	0.227	0.276
2012	0.194	0.146	0.107	0.098	0.201	0.235	0.429	0.318	0.307	0.308	0.229	0.171
2013	0.183	0.189	0.199	0.213	0.282	0.347	0.534	0.293	0.337	0.299	0.372	0.000
2014	—	—	0.145	0.176	0.264	0.000	0.300	0.327	0.356	0.394	—	—
2015	—	0.207	0.184	0.112	0.145	0.261	0.494	0.295	0.307	0.337	0.301	—
2016	—	—	—	—	—	—	—	—	—	—	—	—
2017	—	—	0.063	—	0.090	0.138	0.173	0.122	0.250	0.251	0.315	—
2018	—	—	0.152	0.129	0.185	0.161	0.272	0.147	0.202	0.281	0.315	—
2019	—	—	0.043	0.116	0.136	0.121	0.210	0.205	0.206	0.259	0.407	—
2020	—	—	0.109	0.197	0.158	0.161	0.276	0.226	0.210	0.248	0.316	—
2021	—	—	0.199	0.196	0.178	0.222	0.327	0.295	0.281	0.285	0.285	0.334
2022	—	—	0.161	0.089	0.183	0.183	0.399	0.261	0.250	0.297	0.363	0.284
2023	—	—	0.082	0.206	0.277	0.291	0.424	0.316	0.372	0.360	0.227	0.168
2024	—	—	0.213	0.146	0.222	0.163	0.294	0.224	0.279	0.303	0.418	0.429

Table 6. Observed proportions of males in each pack category, as collected from two pilot studies.

	June 2024			November 2024			
Size Category	<i>MFV Squidon 1</i>	<i>MFV Antonette</i>	Vessels combined	Megaladon	Louise Mari	MFV Michelle	Vessels combined
Small	0.310	0.349	0.319	0.096	0.223	0.565	0.351
Medium	0.648	0.407	0.509	0.865	0.843	0.994	0.895
Large	1.000	0.996	0.998	1.000	1.000	1.000	1.000
X Large	1.000	1.000	1.000	1.000	1.000	1.000	1.000

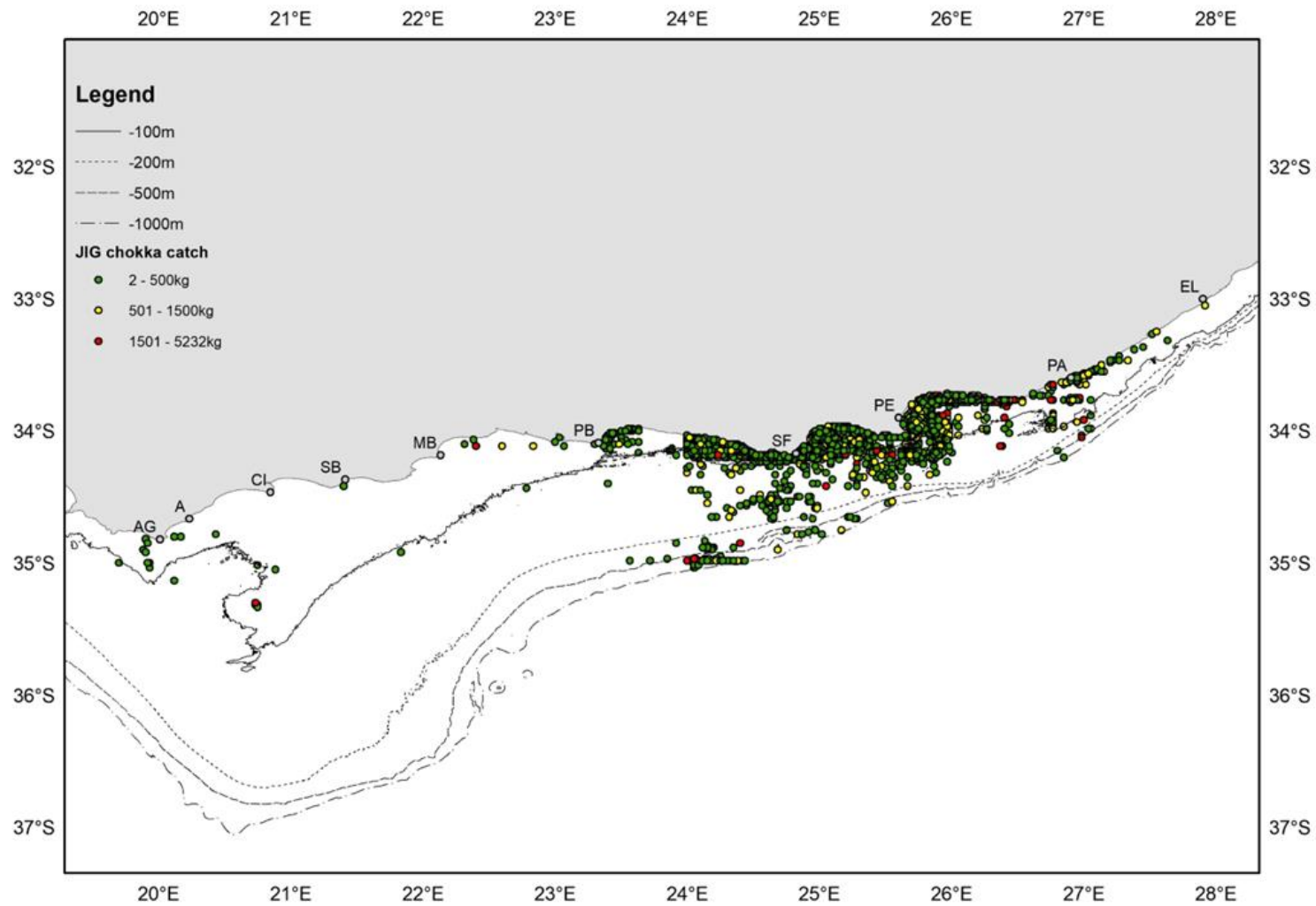


Figure 1. Positions of catches of chokka squid (*Loligo reynaudii*) made by the jig fishery over the period 2017-2023.

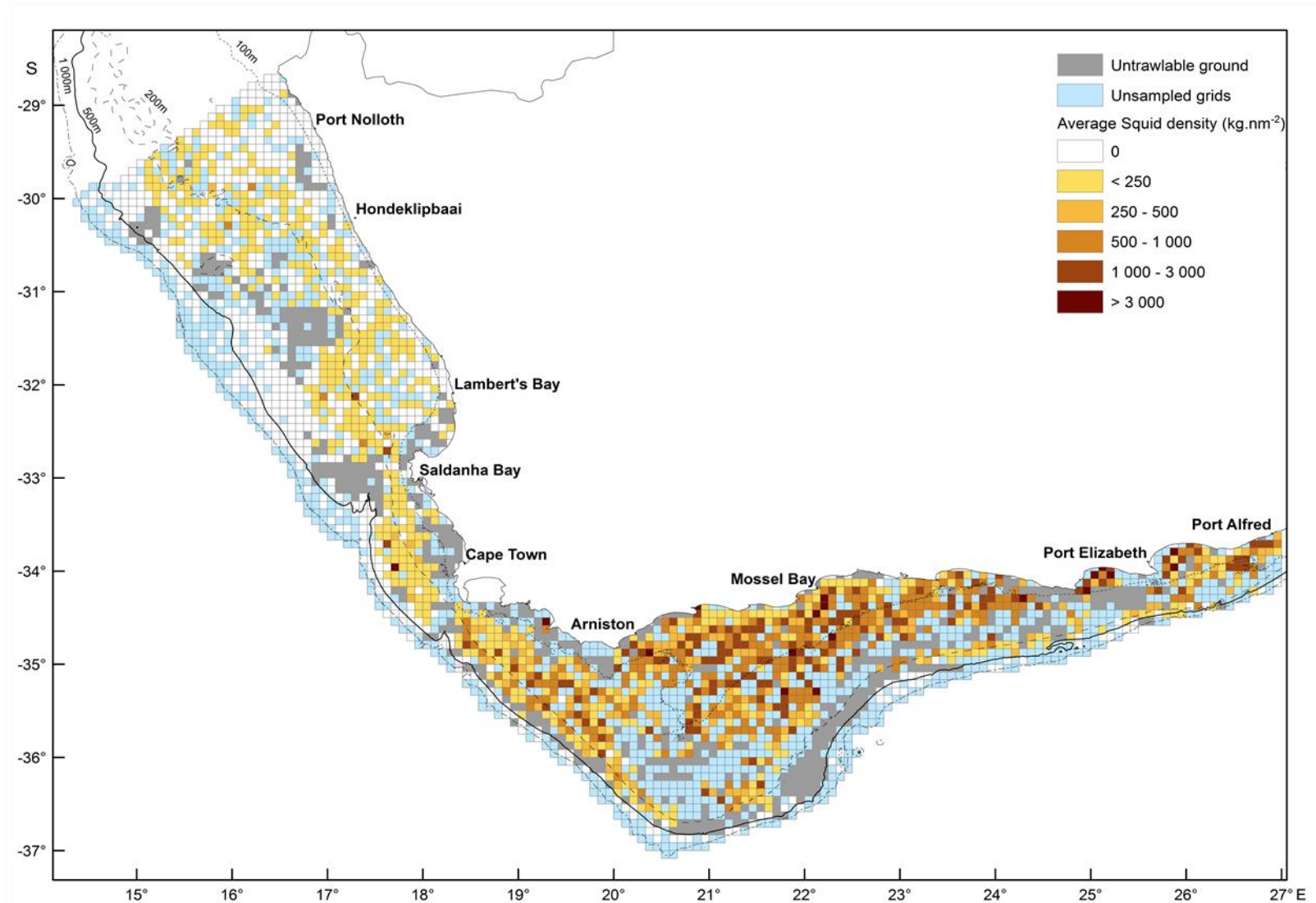


Figure 2. Distribution of chokka squid (*Loligo reynaudii*) as sampled during fishery-independent demersal surveys. Chokka density estimates (kg.nm⁻²) illustrated per 2.5 x 2.5 nm grid block are averages over all survey stations within each grid block over the period 1985-2023.