

Comparison of anchovy and sardine catches within 10 nm from Robben Island with those in the same years from Dassen Island (data from Table 8 in 27) MARAM_IWS_DEC15_PengD_BG1.pdf).

An assumption is made that local biomass levels around each island is correlated (they are close together and are both in the path of the migrations). It is stated that the fleet is cooperative with information, from which one could suggest that they can focus effort on aggregations but also spread effort over available biomass (as determined through observations). If the fleet dynamics really is the case and biomass is correlated it might be expected that catches close to each island should also be correlated.

Using the catch data from Table 8 in *MARAM_IWS_DEC15_PengD_BG1.pdf* an almost complete lack of a relationship is found between anchovy catches around Robben and Dassen islands (Figure 1). However, a relatively strong positive relationship is exhibited between sardine catches between the two islands (Figure 2).

When considering catches within 20nm both species have positive correlations (Figure 3 and Figure 4).

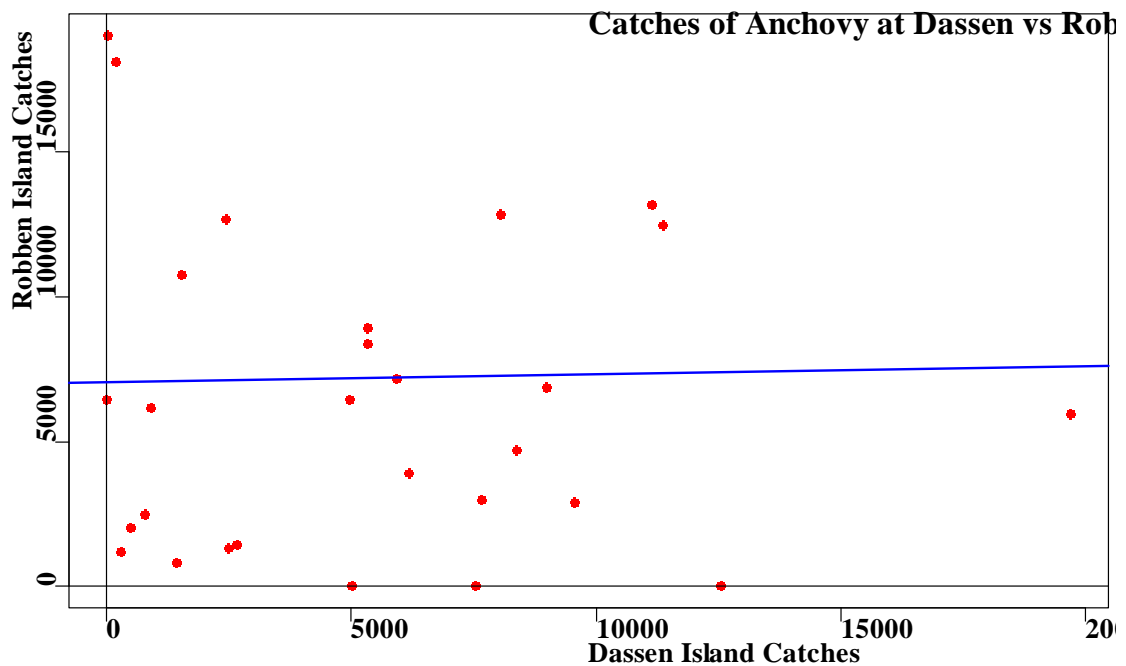


Figure 1. Comparison of anchovy catches within 10 nm from Robben Island with those in the same years from Dassen Island (data from Table 8 in 27) MARAM_IWS_DEC15_PengD_BG1.pdf). The zero lines intersect the values removed from the data sets before calculating the simple regression (blue line; Robben = 7043 + 0.02685 Dassen, adjusted $R^2 = -0.045$, $P = 0.911$). Records with zero catches eliminated from regression.

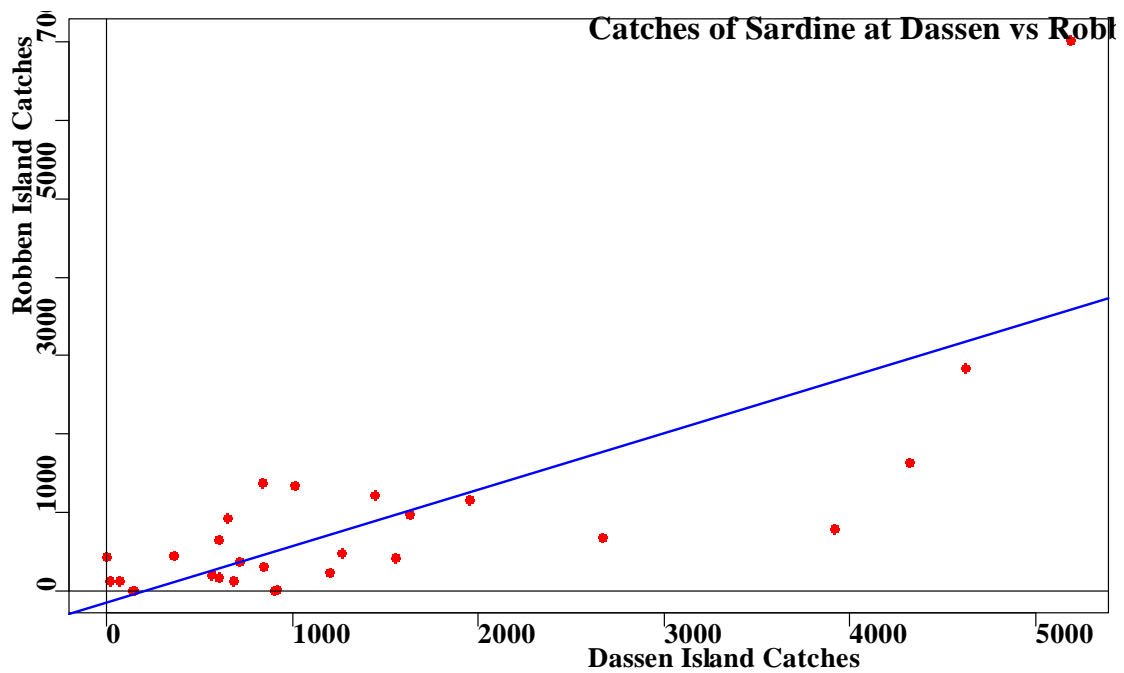


Figure 2. Comparison of sardine catches within 10 nm from Robben Island with those in the same years from Dassen Island (data from Table 8 in 27) MARAM_IWS_DEC15_PengD_BG1.pdf). The zero lines intersect the values removed from the data sets before calculating the simple regression (blue line; Robben = $0.7177 \text{ Dassen} - 139.7$, adjusted $R^2 = 0.5243$, $P = 3.821e-05$). Records with zero catches eliminated from regression.

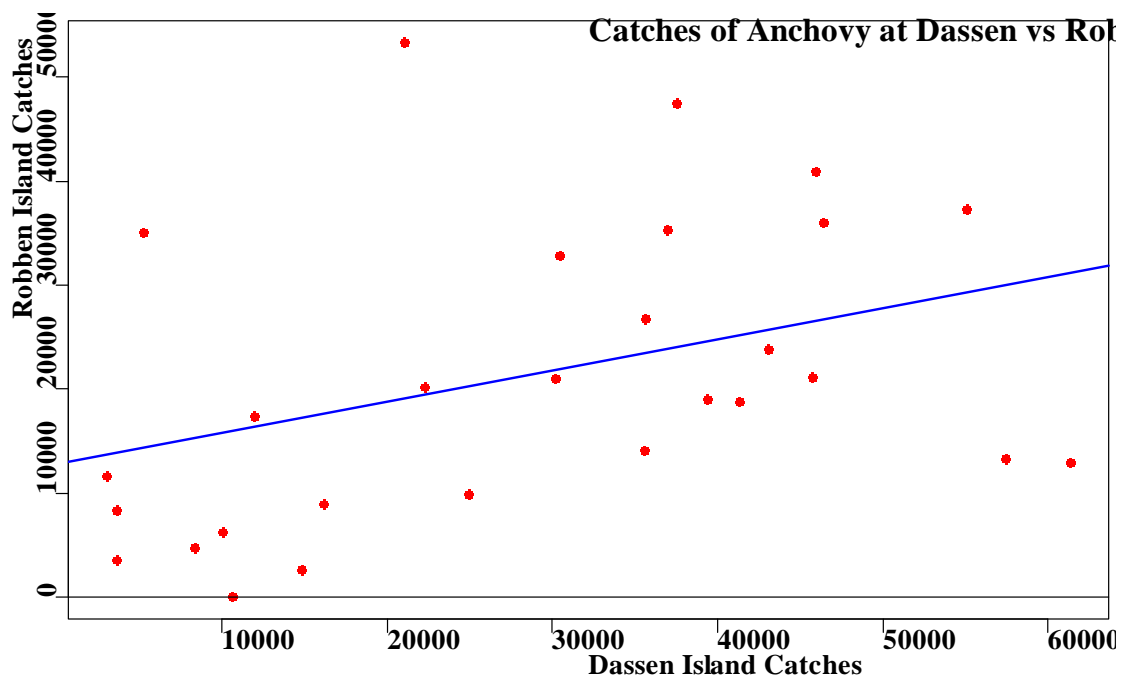


Figure 3. Comparison of anchovy catches within 20 nm from Robben Island with those in the same years

from Dassen Island (data from Table 9 in 27) MARAM_IWS_DEC15_PengD_BG1.pdf). The zero lines intersect the values removed from the data sets before calculating the simple regression (blue line; Robben = 12840 + 0.2986 Dassen, adjusted $R^2 = 0.1107$, $P = 0.0501$). A record with zero catch was eliminated from regression.

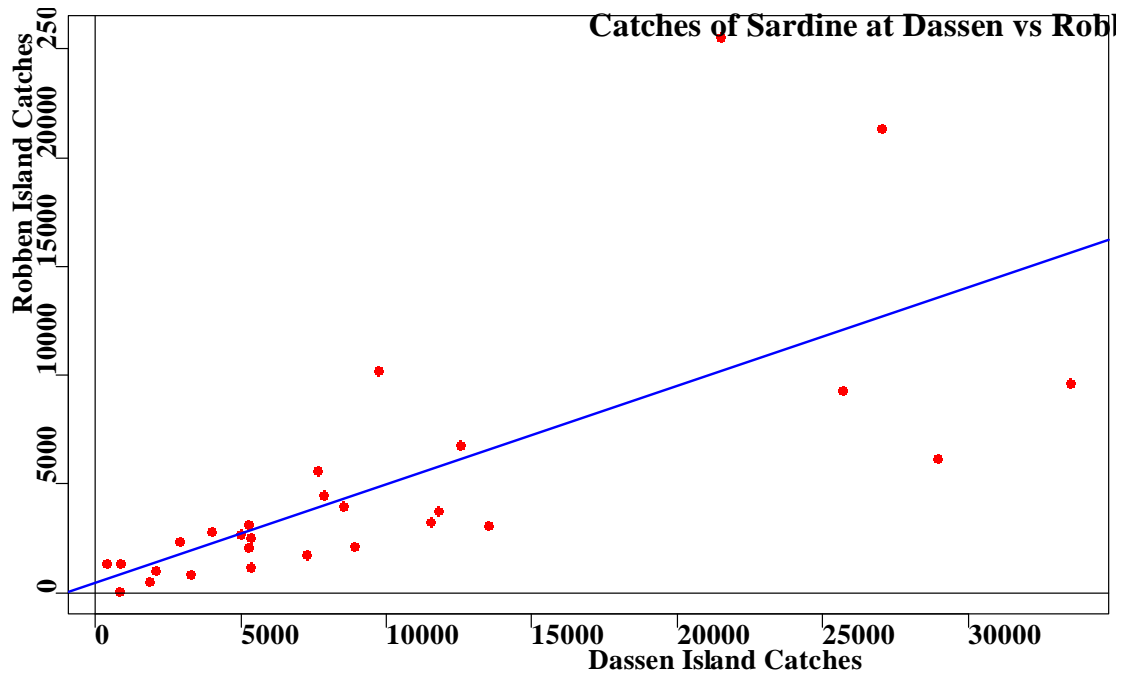


Figure 4. Comparison of sardine catches within 10 nm from Robben Island with those in the same years from Dassen Island (data from Table 8 in 27) MARAM_IWS_DEC15_PengD_BG1.pdf). The zero lines intersect the values removed from the data sets before calculating the simple regression (blue line; Robben = 425.4 + 0.4532 Dassen, adjusted $R^2 = 0.4716$, $P = 3.273e-05$). Records with zero catches eliminated from regression.

Table 8: Catches taken by the purse-seine fishery within 10 nm of the islands. Copied directly from 27) MARAM_IWS_DEC15_PengD_BG1.pdf; see original for more details.

Data provider: Jan van der Westhuizen (DAFF)

10nm	Dassen			Robben			St Croix			Bird		
Year	Anchovy	Sardine	Total	Anchovy	Sardine	Total	Anchov	Sardine	Total	Anchov	Sardine	Total
198	533	56	589	835	19	855	0	0	0	0	0	0
198	151	163	314	1073	97	1171	0	0	0	0	0	0
198	243	60	303	1264	65	1330	0	0	0	0	0	0
199	143	195	338	81	115	197	0	0	0	0	1	1
199	91	126	218	615	47	662	0	6	6	0	0	0
199	593	144	738	715	121	837	0	0	0	0	7	7
199	250	155	405	132	42	174	0	0	0	0	0	0
199	495	83	579	644	138	782	0	0	0	0	3	3
199	266	120	387	142	23	165	0	0	0	0	0	0
199	78	432	511	247	163	410	0	0	0	0	0	0
199	47	65	112	200	93	293	0	0	0	0	0	0
199	28	266	295	119	68	188	0	3	3	0	0	0
199	837	391	1229	467	79	546	0	0	0	0	0	0
200	765	91	857	298	1	299	0	0	0	0	0	0
200	955	68	1023	289	12	302	0	1	1	0	0	0
200	898	462	1360	687	283	970	0	0	0	0	0	0
200	805	518	1324	1283	701	1985	0	3	3	0	0	0
200	534	71	605	890	37	928	0	0	0	0	2	2
200	1969	60	2030	592	16	608	0	0	0	0	9	9
200	1136	101	1238	1244	135	1379	0	6	6	0	16	16
200	1114	36	1151	1315	44	1359	0	30	30	0	91	91
200	19	6	26	1811	12	1823	0	2	2	0	32	32
200	15	1	2	1902	13	1915	0	0	0	0	74	74
201	616	84	701	388	31	420	0	0	0	0	3	3
201	500	90	591	0	0	0	0	0	0	0	0	0
201	1257	14	1271	0	0	0	0	27	27	0	0	0
201	753	14	767	0	0	0	6	16	17	0	0	0
201	0	0	0	646	43	689	0	0	0	0	0	0

**Table 9: Catches taken by the purse-seine fishery within 20 nm of the islands.
Copied directly from 27) MARAM_IWS_DEC15_PengD_BG1.pdf; see original for
more details.**

Data provider: Jan van der Westhuizen (DAFF).

20nm Year	Dassen			Robben			St Croix			Bird		
	Anchovy	Sardine	Total	Anchovy	Sardine	Total	Anchovy	Sardine	Total	Anchovy	Sardine	Total
1987	55122	7280	62401	37283	1733	39016	0	0	0	0	0	0
1988	37539	11539	49077	47413	3222	50635	0	0	0	0	0	0
1989	30498	5038	35536	32766	2653	35419	0	12	12	0	0	0
1990	10028	12548	22575	6224	6784	13008	0	163	163	0	40	40
1991	11977	5285	17262	17309	3092	20400	0	471	471	0	16	16
1992	46421	7886	54307	35917	4465	40382	0	231	231	0	58	58
1993	16144	11818	27961	8960	3757	12718	0	143	143	0	0	0
1994	35678	7638	43316	26707	5594	32301	0	355	355	0	31	31
1995	24930	13536	38467	9911	3087	12998	0	509	509	0	0	0
1996	8353	28978	37331	4665	6147	10812	0	614	614	0	0	0
1997	3672	9730	13402	8351	10168	18519	0	36	36	0	0	0
1998	3635	25706	29341	3595	9301	12896	0	2660	2660	0	0	0
1999	41325	33526	74851	18767	9588	28355	0	1482	1482	0	0	0
2000	35551	8916	44467	14096	2112	16208	0	668	668	0	0	0
2001	57509	8518	66027	13282	3982	17263	0	1100	1100	0	20	20
2002	39423	27062	66485	18975	21328	40303	0	4105	4105	0	12	12
2003	36957	21528	58486	35309	25545	60853	0	14818	14818	0	0	0
2004	30179	2911	33091	20957	2336	23293	0	3976	3976	0	90	90
2005	61371	1862	63233	12943	486	13430	0	1071	1071	0	125	125
2006	43067	4004	47071	23764	2760	26523	0	9485	9485	0	5570	5570
2007	45981	5278	51260	40881	2036	42917	0	2606	2606	0	5854	5854
2008	21071	3324	24395	53327	802	54129	0	491	491	2	3600	3602
2009	5256	420	5676	34991	1315	36306	0	320	320	1	3214	3215
2010	22264	5337	27601	20145	2487	22632	0	1736	1736	0	2028	2028
2011	14888	5355	20243	2558	1143	3701	0	678	678	0	68	68
2012	45743	2071	47814	21049	983	22032	5	4466	4471	0	205	205
2013	10668	831	11499	0	18	18	21	3283	3303	0	420	420
2014	3063	874	3937	11580	1340	12920	0	479	479	0	9	9