

Additional calculations requested 30 November 2015 for the Opportunity Based Model

by

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The panel made the following suggestions for further work, in order of priority:

Analysis related

- a) Super-analysis: (i) select the set which leads to the highest catch rate among all possible sets (no hierarchy), and (ii) do not cap the catch by the actual catch for a set.
- b) Check if 'day' can be replaced by '3-day window'. If the results change to a notable extent:
- c) Replace step 7a by selecting the highest catch rate.
- d) Replace step 7b by not constraining the catch to the actual catch for a set.

Documentation / understanding

- a) Indicate how many sets are replaced by zeros and how many by lower catches *by year*.
- b) List the number of sets that need to be moved *by year*.

Response to panel request viewed as overnight requirement: Analysis related (a) has been carried out (Fig. 1a in the table below). Analysis related (b)-(d) was not carried out because this is a larger task than could be accomplished overnight in the context of existing OBM code. Documentation / understanding (a), (b) has been carried out for the ALL opportunity option and the ADJ, ADJ2 and Other Island opportunity option (see **Figs 3 and 4a,b**).

A number of other runs were carried out as seemed logical in the context of the day's discussions, as presented below (for all years):

Fig #	7a (max of all opportunities or randomly selected)	7b (capped at actual set, or no cap or boat cap or boat x year cap)	Hierarchy (in groups or all lumped together)	Alternative opportunities. ALL = ADJ, ADJ2, OTHER, GANSBAAI, ST HELENA BAY, EXTRA	Set selection	% Lost
B.C.	RANDOM	CAPPED	IN GROUPS	ALL	ALL	40.52%
1a	MAX	NO CAP	LUMPED	ALL	ALL	-26.26%
2a	MAX	CAPPED	IN GROUPS	ALL	ALL	41.52%
2b	RANDOM	NO CAP	IN GROUPS	ALL	ALL	23.68%

2c	RANDOM	CAPPED	LUMPED	ALL	ALL	44.81%
1b	MAX	NO CAP	LUMPED	ADJ, ADJ2, OTHER ISLAND	ALL	4.90%
1c	MAX	NO CAP	IN GROUPS	ADJ, ADJ2, OTHER ISLAND	ALL	12.06%
2d	MAX	CAPPED	LUMPED	ALL	ALL	27.19%
1c'	MAX	NO CAP	IN GROUPS	ADJ, ADJ2, OTHER ISLAND	>15% Anchovy	12.17%
1b'	MAX	NO CAP	LUMPED	ADJ, ADJ2, OTHER ISLAND	>15% Anchovy	5.12%
1a''	MAX	BOAT CAP	LUMPED	ALL	ALL	-11.74%
1a'''	MAX	NO CAP	LUMPED	ALL - St Helena Bay	ALL	-11.83%
1a''''	MAX	BOAT x YEAR CAP	LUMPED	ALL	ALL	-12.01%
2b'	RANDOM	NO CAP	IN GROUPS	ALL	>=2008	29.23%
2b''	RANDOM	BOAT x YEAR CAP	IN GROUPS	ALL	ALL	24.48%

“Tiny set issue”: Sets where anchovy is an incidental small component. There is a potential issue with these sets. We have tried to address this by removing all sets with catches with less than a 15% anchovy content to given an idea of the impact that this is having. Before removing those sets we have a total catch 1987 - 2014 of 7.765 million MT (but based on standardized sets), removing sets with less than a 15% content of anchovy reduces this figure to 7.731 million MT. The results (Fig 1c' compared to Fig 1c) indicate that the role of this effect is small.

OBSERVATIONS

1. Scale of effects depends on other settings so the following are likely to be context specific.
2. Effect of extra opportunities in context of MAX, NO CAP, LUMPED: Compare 1a,1b, 1a''' - suggests Extra, Gansbaai and St Helena Bay add about 30%, and that St Helena Bay on its own adds about 15%.
3. Effect of capping: 2b versus B.C. Removing capping adds about 17%.
4. Effect of lumping opportunities in the context of choosing maximum alternative opportunity: 2d versus 2a adds about 14%.
5. Effect of no cap compared to a pragmatic **boat specific cap** of maximum catch over all years: 1a'' versus 1a: adds about 15%.
6. Effect of no cap compared to a pragmatic **boat x year specific cap** of maximum catch in each year per boat: 1a'' versus 1a: adds about 15%.
7. Maximum versus random alternative opportunity selection in the context of lumped opportunities: 2d vs 2c adds about 17%.
8. 2b versus 2b': 6% additional unreplaceable catch Saldanha Bay factory effect >= 2008 years. Also however confused with other island possibly closed.

Fig 1a

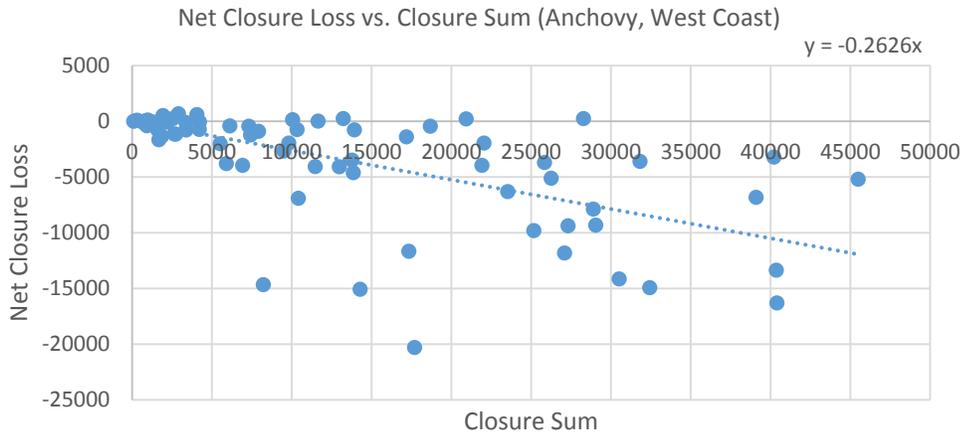


Fig 1a''

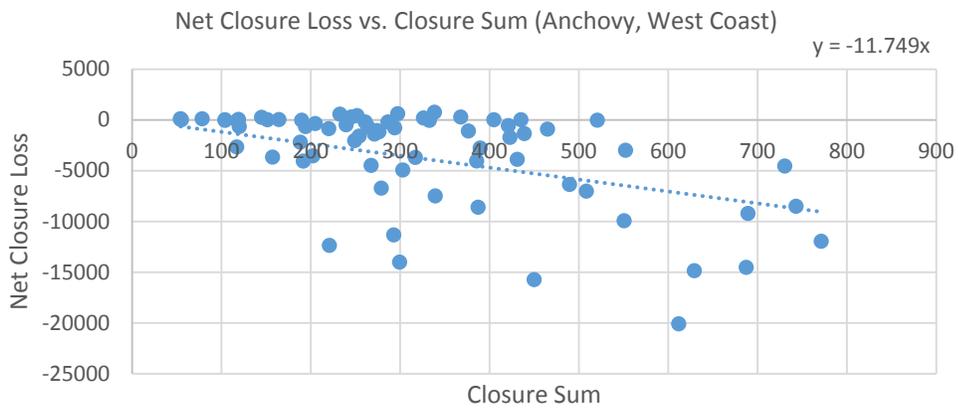


Fig 1a'''

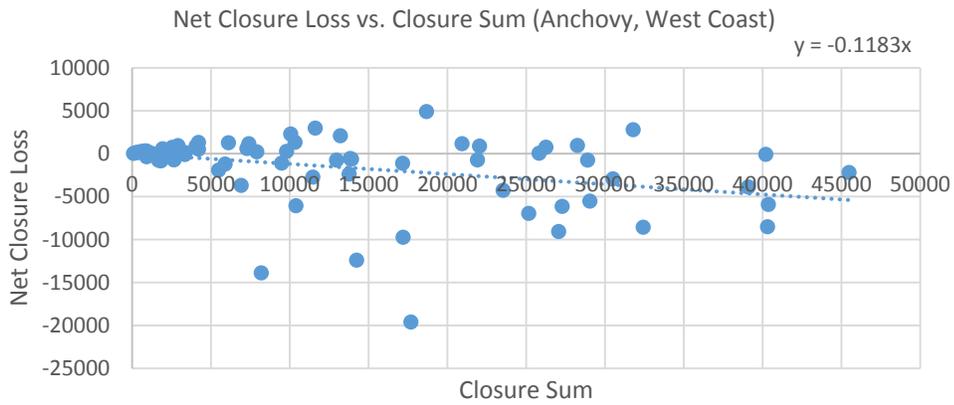


Fig 1a''''

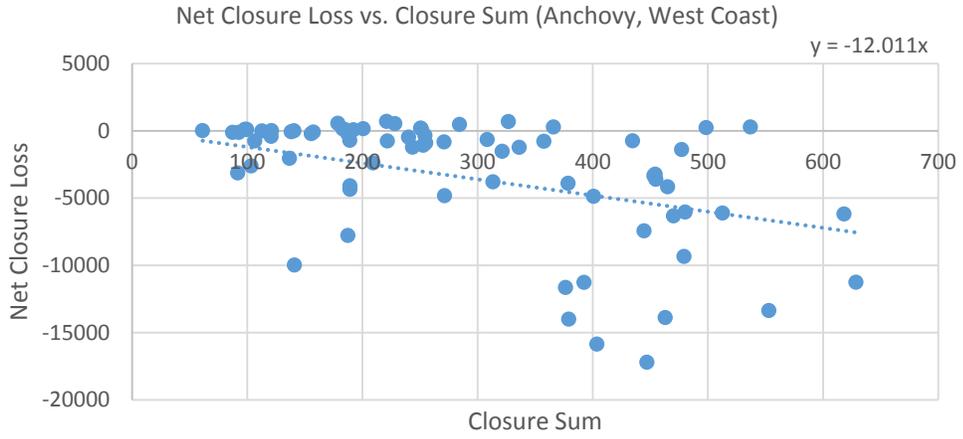


Fig 1b

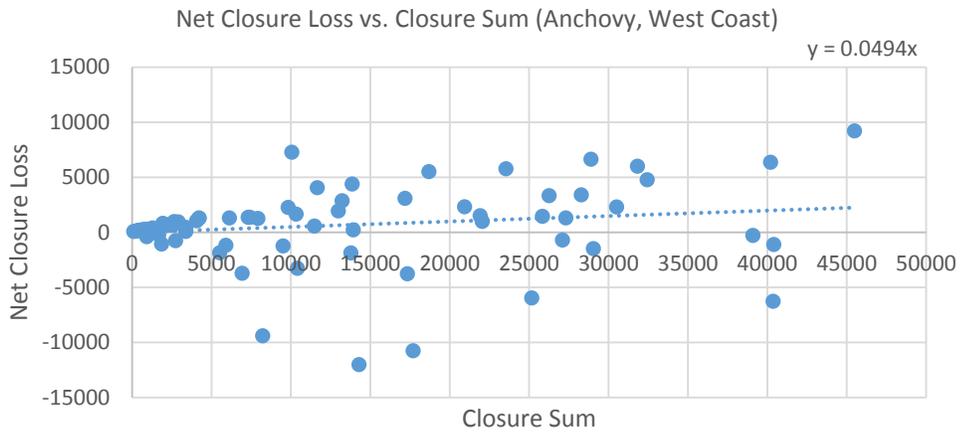


Fig 1b'

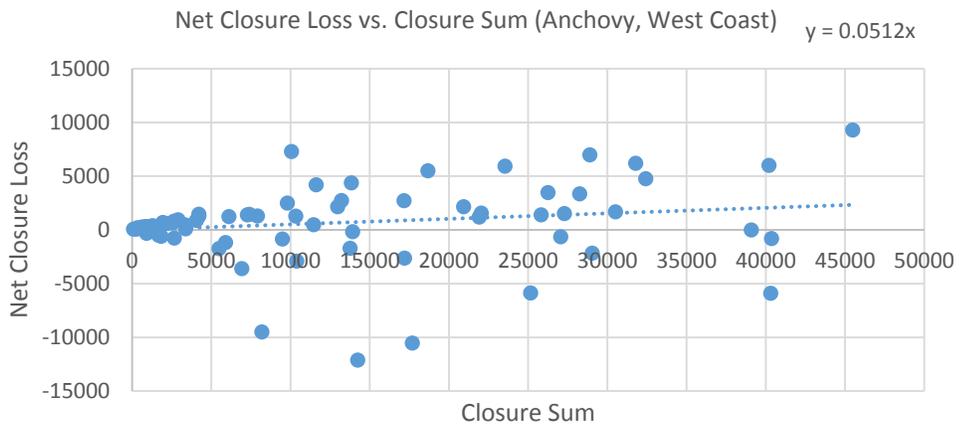


Fig 1c

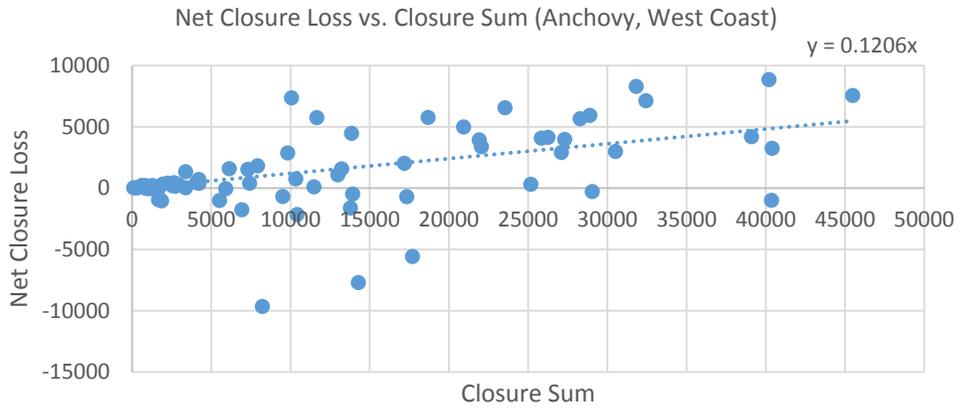


Fig 1c'

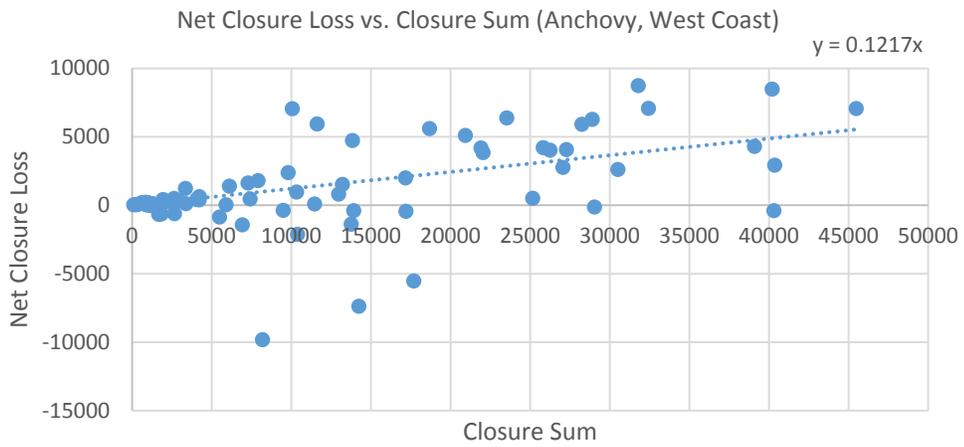


Fig 2a

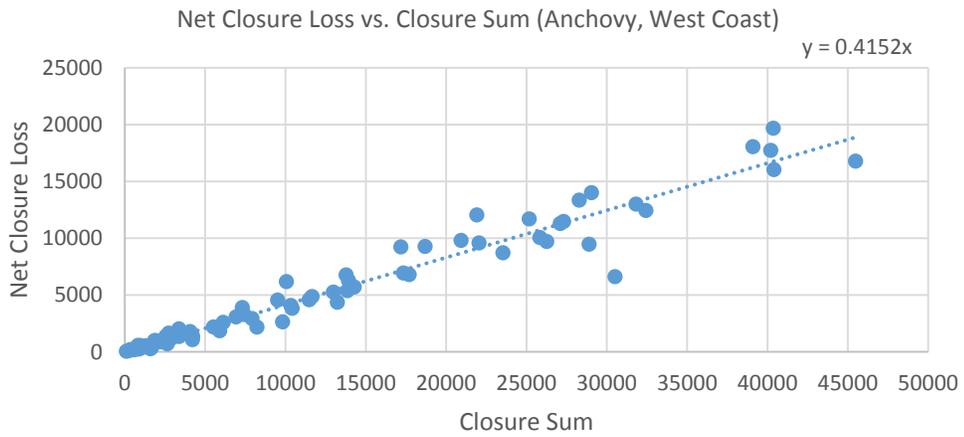


Fig 2b

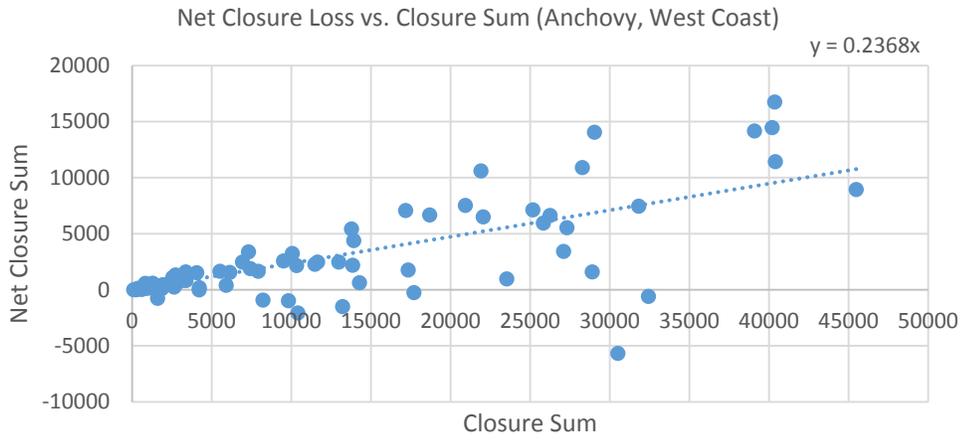


Fig 2c

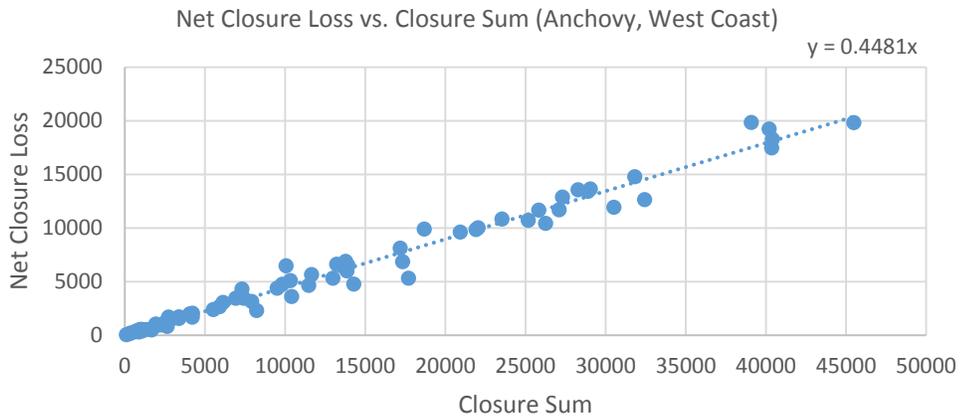
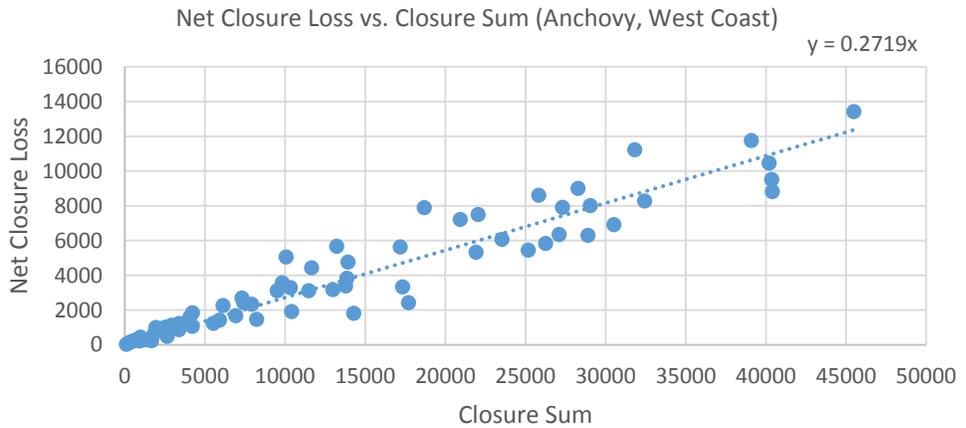


Fig 2d



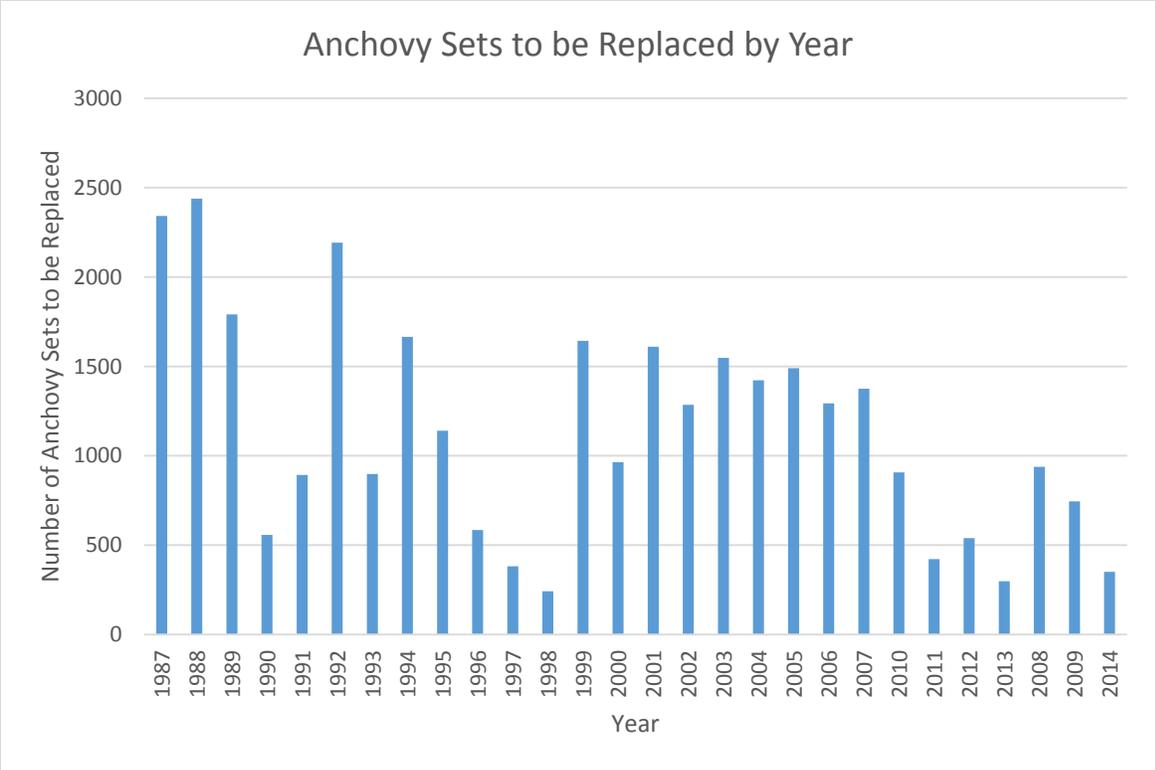


Fig 3. Number of sets needing to be replaced each year for Dassen Island and Robben Island added together.

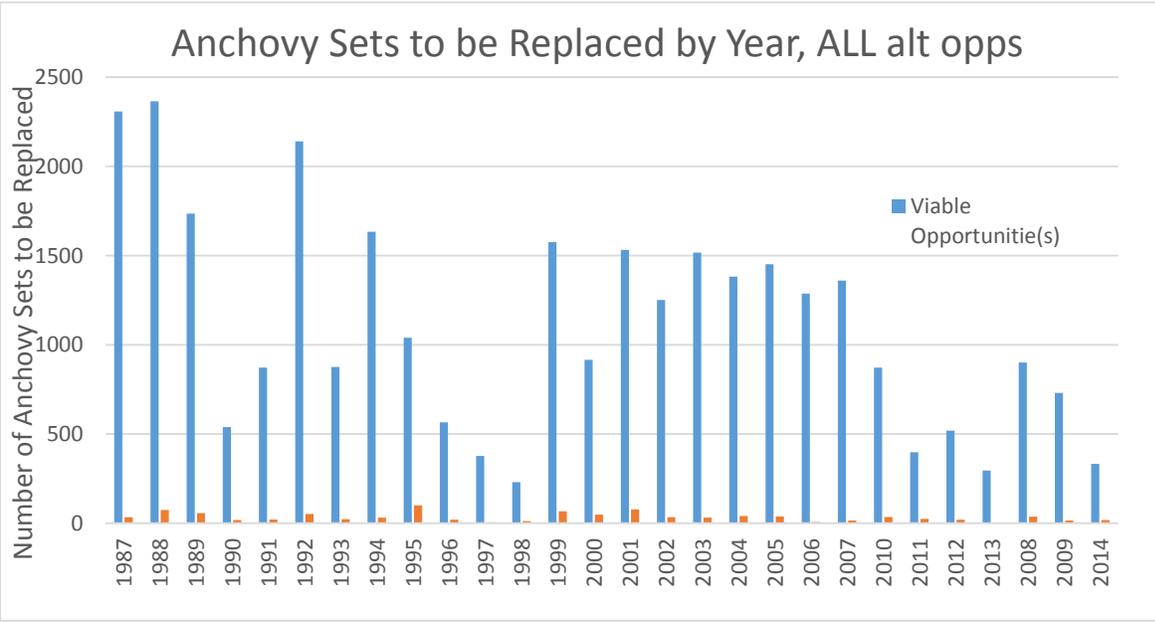


Fig 4a. Orange bars indicate instances of no alternative opportunities.

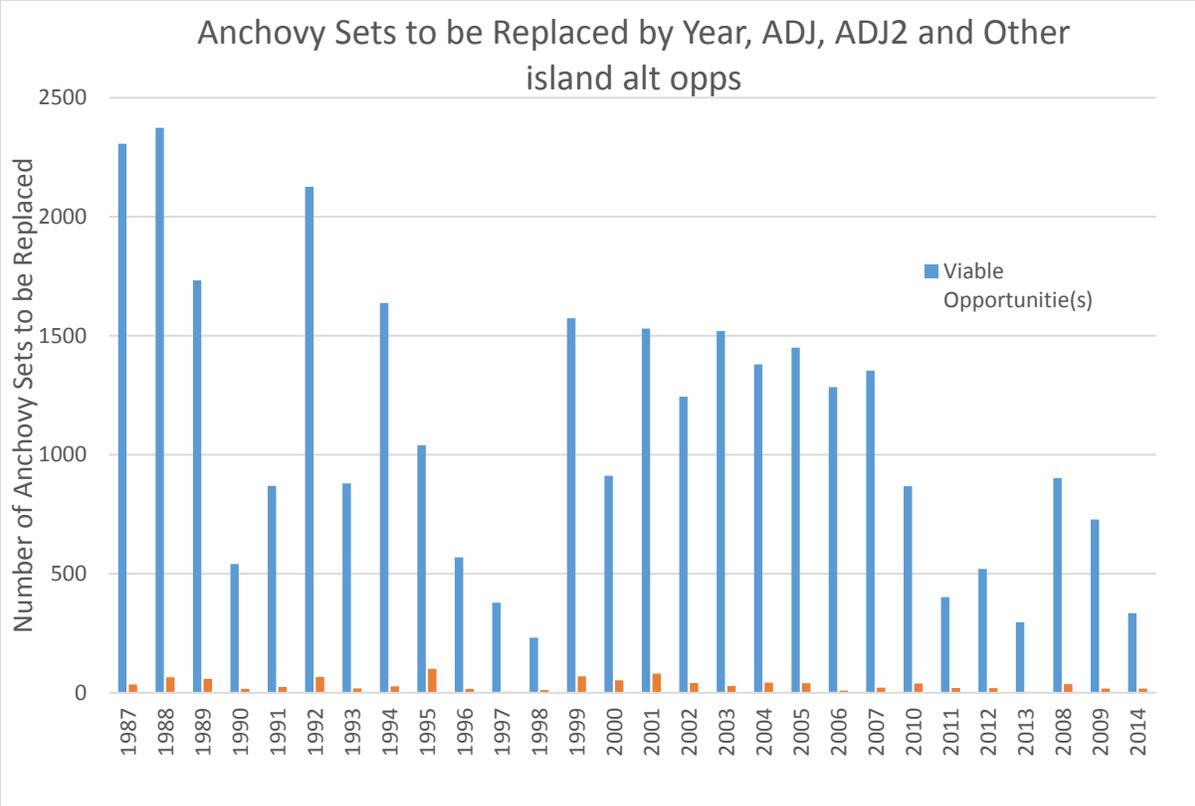


Fig 4b. Orange bars indicate instances of no alternative opportunities.