

## Updated 2020 poaching time series for use in west coast rock lobster population models

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### Summary

This document describes the methods used to provide updated 2020 poaching time series for each super-area and the resource as a whole for use in west coast rock lobster population models.

**KEY WORDS:** West coast rock lobster, poaching

### Background

There are three sources of information on poaching which need to be combined.

- 1) The **TRAFFIC** time series of annual amounts of poached lobster exported, obtained by comparison of international import and export statistics. These values are absolute (in tons) and are underestimates of the total amount poached each year as they do not include illegal catches sold locally. These data extend from 2001 to 2019. A method of applying linear regressions to pre-2019 values was used to produce a more reliable estimate for 2019 of 500t (see Appendix).
- 2) The **compliance** trend series obtained from statistics collected by the DEFF compliance section from 2008 to 2019. These are relative indices (i.e. NOT in tons) and are taken to apply to all poaching (i.e. covering both international and local sales). Some assumption is needed to scale these values to absolute quantities in tons.
- 3) Impressions of the likely size of the **locally sold illegal catch** in 2019. The west coast rock lobster task team (TT) had different views on the appropriate value for this amount, but reached a compromise agreement to consider a range from 400 to 700 tons. The value assumed here is of importance for the process used to scale the compliance series to tons. The scaling factor is the ratio of the sum of the 2019 international illegal amount (from TRAFFIC) and the local illegal amount, divided by the 2019 compliance series value.

The final composite series was constructed by:

- a) Using the TRAFFIC time series to 2008.
- b) From 2009 to 2019 using the compliance series calibrated as described in 3).

### Further information

Previous TT proposals regarding poaching trends and quantities were developed through a number of steps. These are set out in detail below.

#### North:South split (North A3-7 : South A8+) (unchanged from previous years' assumptions)

North : South in 2008: 30 : 70

The relative splits of poaching in the North area amongst A3+4, A5+6 and A7 remain as previously, and are (as a % of poaching in the North):

A3+4: 37.5% (i.e. in 2008 11.25% of total)

A5+6: 37.5% (i.e. in 2008 11.25% of total)

A7: 25.0% (i.e. in 2008 7.5% of total)

#### **Historical Trend (relative trend with a value of 1.0 in 2008)**

Pre-1990	0.5 in 1990 decreasing linearly to zero in 1950
South 1990 – 2008	0.5 (in 1990) → 1.13 (in 2008)
North 1990 – 2008	0.5 (in 1990) → 1.00 (in 2008)

#### **TRAFFIC absolute values**

The TRAFFIC data provide absolute estimates of poaching for the 2001-2019 period. A value of 500t is taken to be the more reliable estimate for 2019 (based on linear regression analyses (Johnston and Butterworth 2020)). Figure 1 shows these estimates.

#### **The compliance trend series**

Figure 2 shows the final estimates of trends in poaching from the DEFF compliance data for both the North (A3-7) and South (A8+). The plots show the results from the application of the 3-pt smoothing method (Brandao and Butterworth 2021) to summarise those estimates.

#### **Final Trends**

The final two poaching series (local sales of either 400 MT or 700 MT in 2019) are shown in Figure 3a. Figure 3b compares these scenarios with those assumed in 2019.

#### **Trends at super-area level**

Figure 4 shows the alternative poaching scenarios for each super-area in absolute terms (MT). The left panels show trends assuming local sales of 400t in 2019 and the right panels show trends assuming local sales of 700t in 2019. Figure 5 compares the poaching trends in each super-area assuming local sales of 700t. Note how A8+ increasingly dominates the overall poaching for the resource.

#### **References**

Brandao, A. and Butterworth, D.S. 2021. Updated trends in poaching for West Coast rock lobster from modelling the “old” and the “new” databases simultaneously.

FISHERIES/2021/MAY/SWG/WCRL/02.

Louw, S. and Burgener, M. 2020. Estimating the discrepancy between world reported imports and South African landings data for west coast rock lobster, 2000-2019.

FISHERIES/2020/AUG/SWG/WCRL/06.

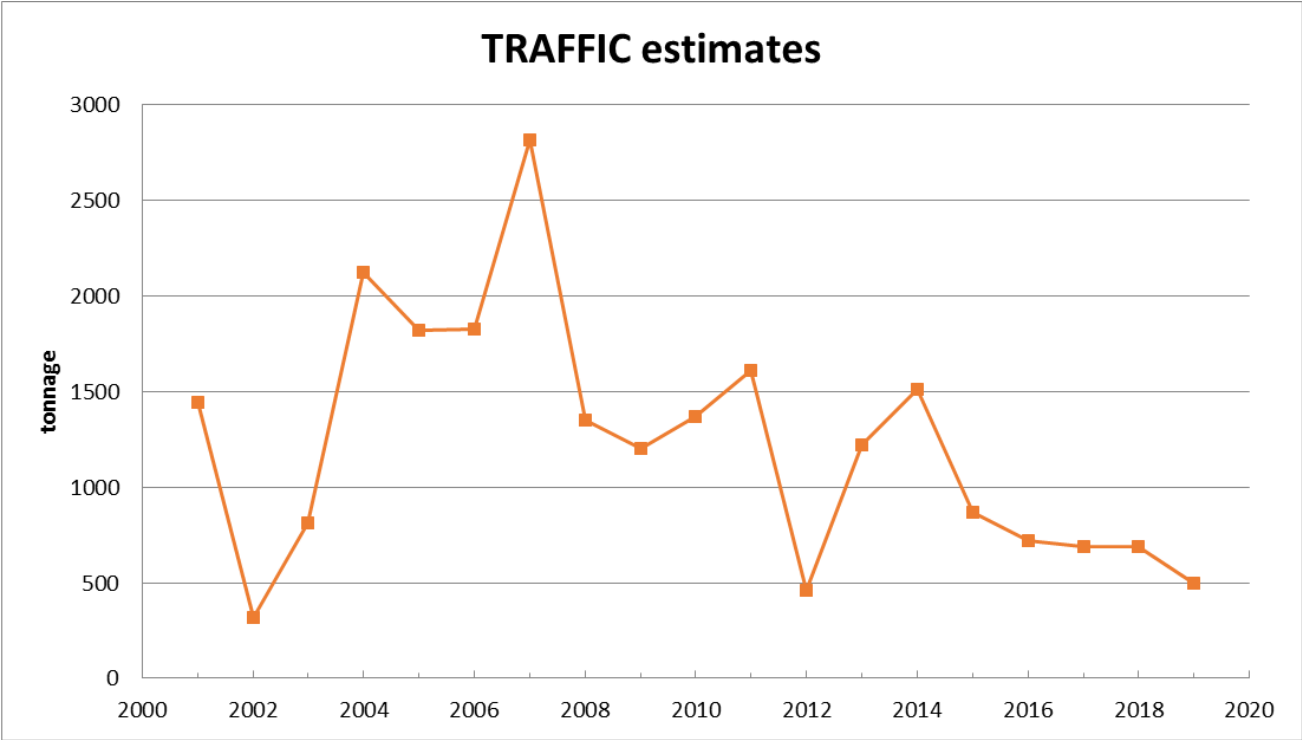


Figure 1: Estimates of poached lobster obtained from TRAFFIC import-export data analyses (Louw and Burgener 2020).

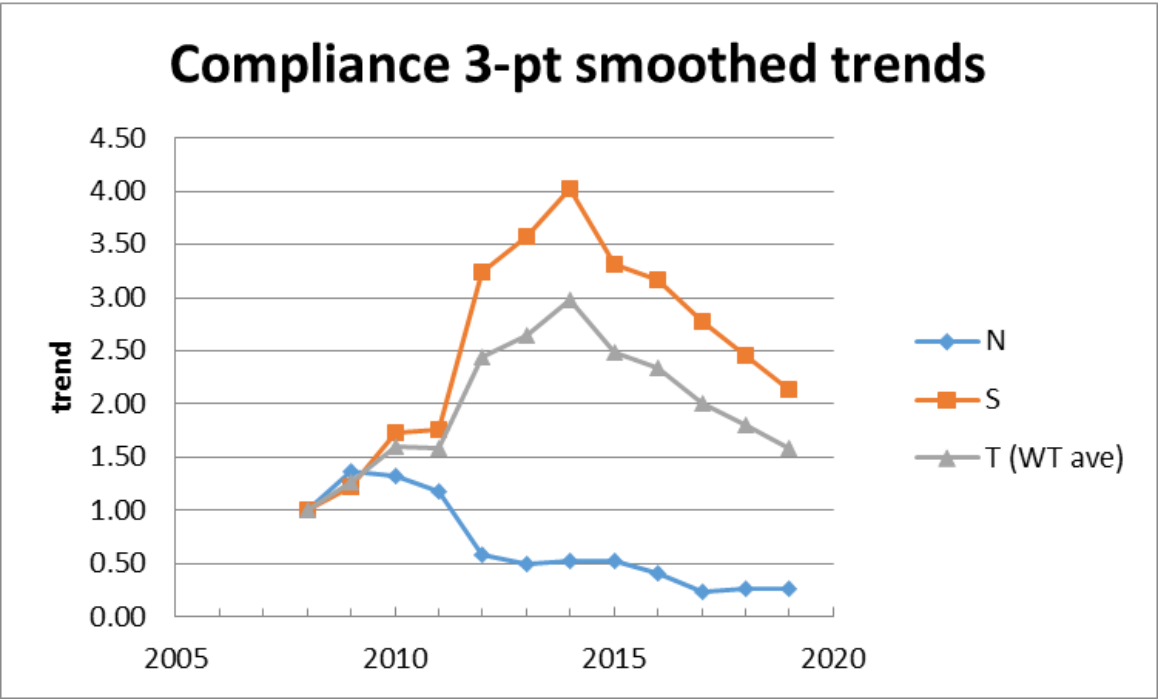


Figure 2: Poaching trends for 2020 for the North and South obtained from DEFF compliance data using 3-pt smoothing (Brandao and Butterworth 2021). The weighted-average for the total resource is also shown.

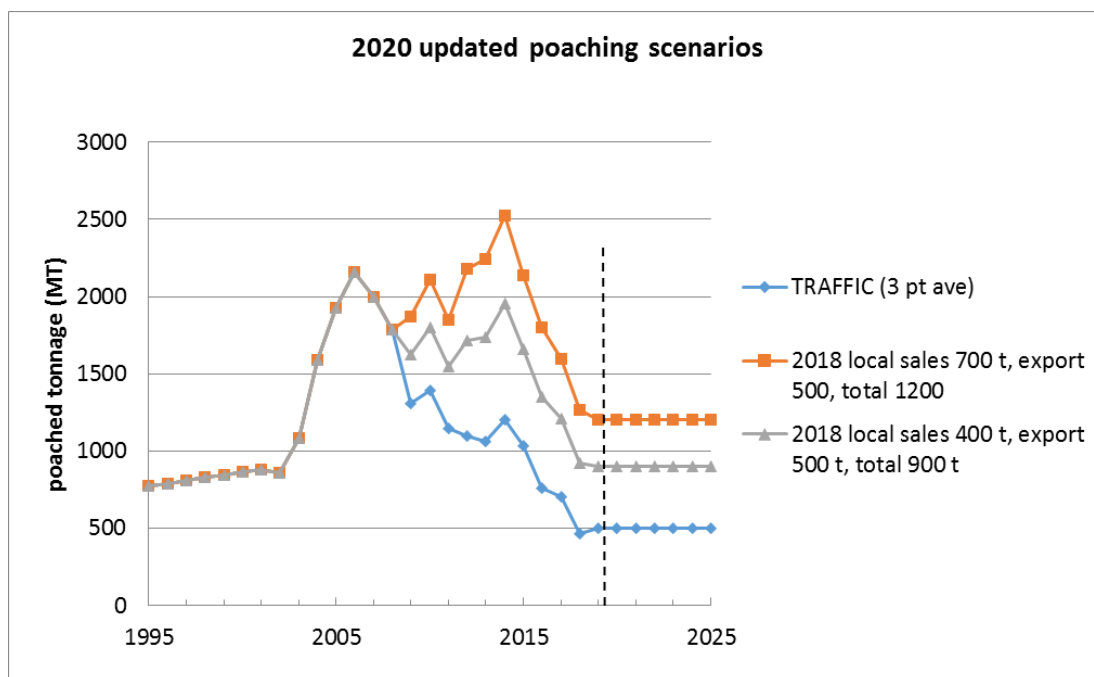


Figure 3a: Alternative 2020 poaching time series for the resource as a whole in absolute terms (MT). The TRAFFIC time series also indicated (blue). The black dashed line refers to start of projection period.

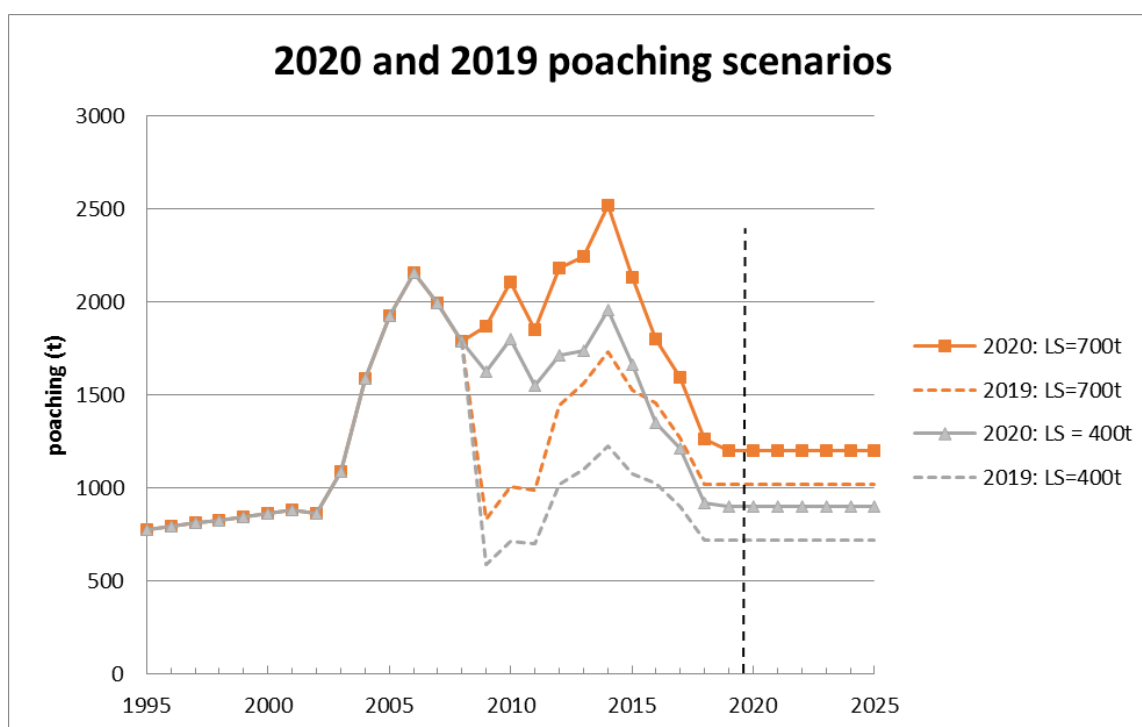


Figure 3b: Comparisons between the 2019 (LS=400t or 700t in 2018) and updated 2020 (LS=400t or 700t in 2019) alternative poaching time series for the resource as a whole in absolute terms (MT). The black dashed line refers to start of projection period.

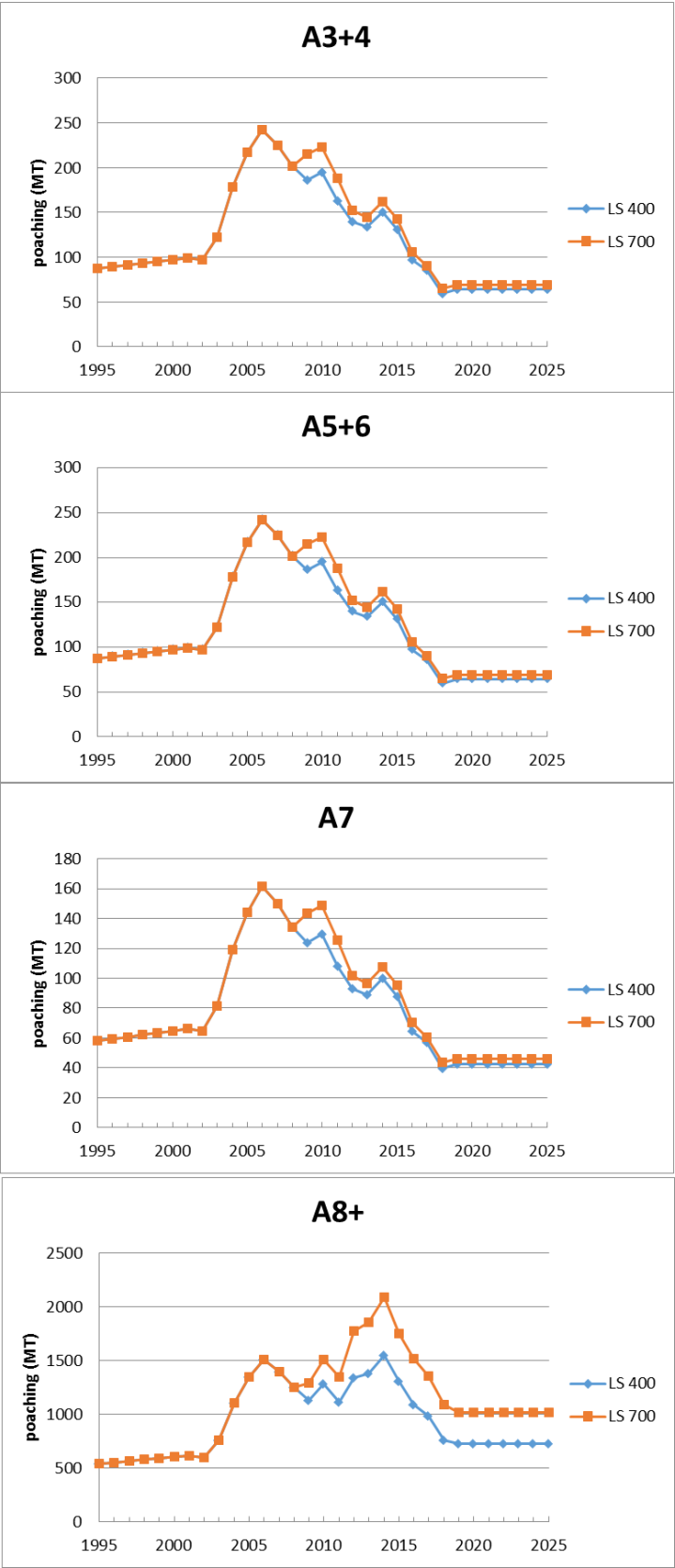


Figure 4: Alternative 2020 poaching scenarios for each super-area in absolute terms (MT) (assuming local sales of either 400t or 700t for 2019.)

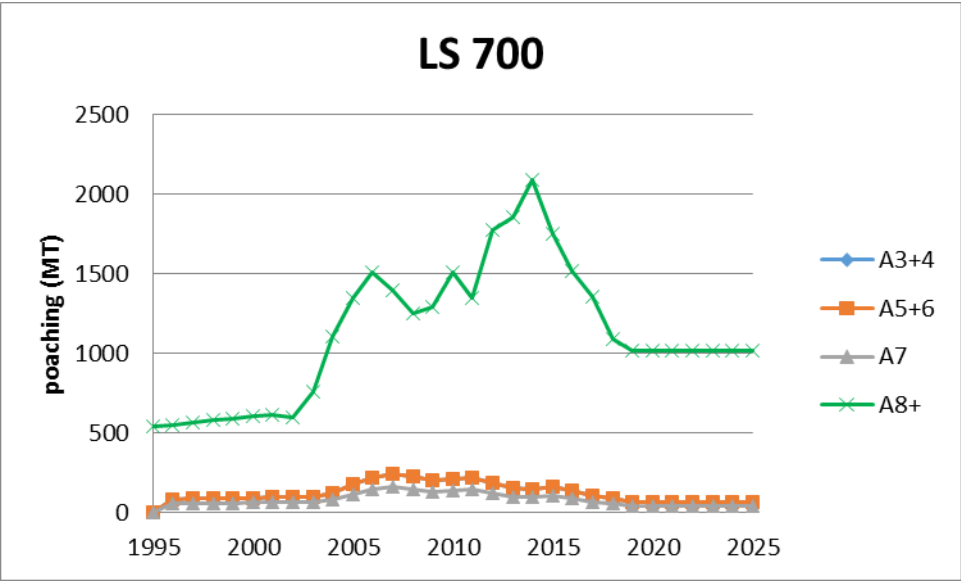


Figure 5: Poaching trends for each super-area assuming local sales of 700t for 2019.

## Appendix

### Projected TRAFFIC estimates for 2019 assuming different starting years for linear regressions

Updated TRAFFIC estimates were recently provided (Louw and Burgener 2020). The estimate of only 12.6 mt for 2019 is surprising.

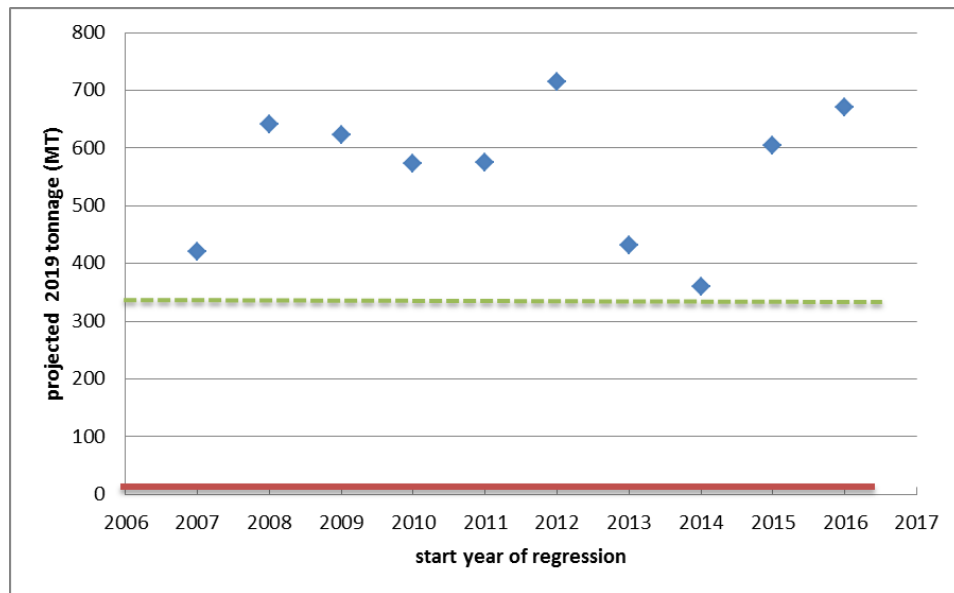
The authors applied linear regressions to these estimates for different starting years up to and including the 2018 estimate. Each regression was then used to predict the value for 2019.

Table A1 and Figure A1 report these values. The regressions themselves are shown in Figure A2.

Table A1: Projected 2019 TRAFFIC estimates for different starting years.

Starting year	Projected 2019 estimate
2007	420
2008	641
2009	623
2010	1119
2011	574
2012	715
2013	433
2014	360
2015	604
2016	670

Figure A1: Plots of values in Table A1. The horizontal red line indicates the updated original TRAFFIC 2019 estimate of 12.6 mt. The green dashed line indicates the value assumed for projections last year (318mt – this excludes the local sales estimate).





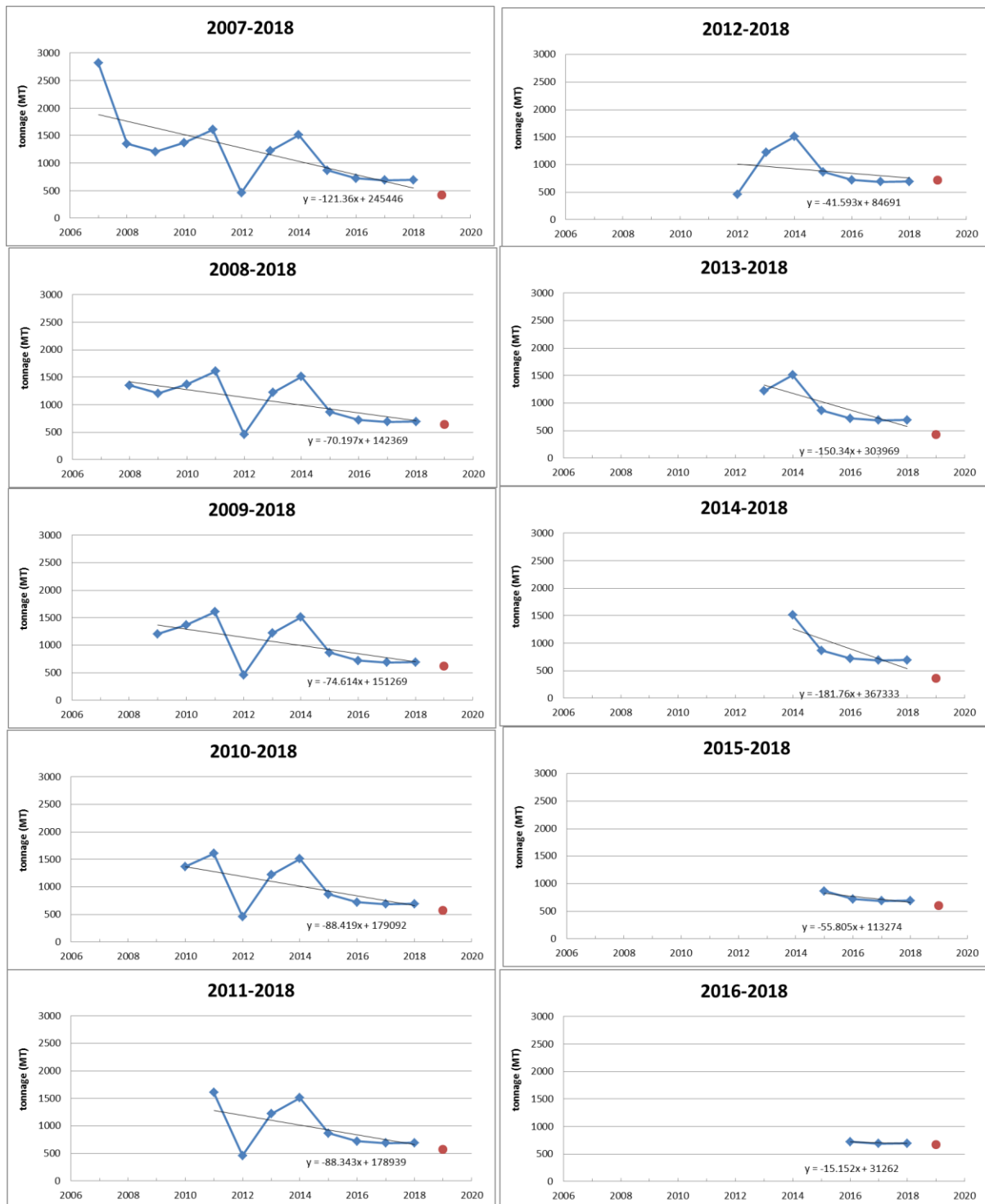


Figure A2: Details of each regression. In each plot the predicted value for 2019 is shown as a red circle.