TAC values for 2015[1] season for West Coast rock lobster using OMP-2015

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OMP 2015 (described fully in Johnston *et al.* 2015) has recently been adopted as the revised OMP for the West Coast Rock Lobster fishery. It is to be used to recommend the TACs for the West Coast rock lobster fishery for the 2015 season. The resultant TAC recommendations are listed in Table 1 for each sector and each super-area. The TACs for the 2014 seasons are also provided for comparison. Input data are listed in Tables 2a-e.

The global TAC recommended for the 2015 season is **1924.08 MT** (a 6.83% increase from 2014/15 season). The offshore commercial catch is increased from 1120.25 to 1243.48 MT. Allocations to the other three sectors are unchanged, with the nearshore commercial sector allocation at 376.10 MT, the subsistence/IR sector at 235.30 MT and the recreational sector at 69.20 MT. The OMP states regarding the recreational season that:

> "For the Recreational sector, the adjustment will be effected by changing the duration of the season by the same proportion as the allocation is changed, starting from a baseline of 80 days for the 2007-2009 allocations each of 257 tons. This will be kept under review in the light of telephone survey and permit sale records, and adjusted if necessary in proportion to changes in these."

Assuming that the telephone survey and permit sales records do not suggest the need for any such adjustment, the recreational season length recommended is thus 69.20 x 80/257 = 21 days.

[1] The split season 2015/2016 if referenced here by the first year "2015"

Details of the OMP calculations

The input data are reported in Tables 2a-e. These data are were reported in Brandão and Butterworth 2015, Glazer 2015a,b,c,d and OLRAC (2015).

The resultant resource indices calculated in the OMP using the data in Tables 2a-e are as follows:

$\bar{J}_{2015}$=0.913 (this is the super-area and gear combined index of current abundance relative to the 2009-2013 average).

$J_{2015}^{trap} = 0.778$ (this is the trap gear index averaged over super-areas for which data are available)

$J_{2015}^{hoop} = 0.870$ (this is the hoop gear index averaged over super-areas for which data are available)

$J_{2015}^{FIMS} = 1.289$ (this is the FIMS index averaged over super-areas for which data are available)

$J_{A1+2,2015} = 0.901$ (this is the geometric mean of the previous three years' gear-combined index of abundance for super-area A1+2)

$J_{A3+4,2015} = 1.599$ (this is the geometric mean of the previous three years' gear-combined index of abundance for super-area A3+4)

$J_{A5+6,2015} = 0.992$ (this is the geometric mean of the previous three years' gear-combined index of abundance for super-area A5+6)

$J_{A7,2015} = 0.710$ (this is the geometric mean of the previous three years' gear-combined index of abundance for super-area A7)

$J_{A8+,2015} = 0.901$ (this is the geometric mean of the previous three years' gear-combined index of abundance for super-area A8+).

The five indices above are what are used to determine if Exceptional Circumstances (ECs) should be invoked for any one of the super-areas due to very poor resource performance.

The values of X_{crit}^{area} below which EC would be declared for that super-area are:

X_{crit}^{A1+2} =0.7

X_{crit}^{A3+4} =0.85

X_{crit}^{A5+6} =0.7

X_{crit}^{A7} =0.8

X_{crit}^{A8+} =0.7

Thus ECs are invoked for Area 7 for season 2015 (0.710 < 0.8). See the Appendix for details.

Global TAC calculation

First, an initial global TAC is computed using Equation (5) of Johnston and Butterworth (2015):

$$TAC_y^{G,1} = \alpha\left(\bar{J}_y - J_{min}\right)$$

$$= 5000(0.9125 - 0.2)$$

$$= \text{ 3562.5 MT}$$

This initial global TAC value from equation (5) is then adjusted (up or down) to allow for the recent somatic growth rate by the addition of an amount "Z" such that:

$$TAC_y^{G,2} = TAC_y^{G,1} + Z$$

where

$$Z = \bar{x}\frac{SG_{y-1,y-2,y-3} - SG_{low}}{SG_{med} - SG_{low}}$$

$$= \frac{2586(3.056 - 3.360)}{4.228 - 3.360}$$

$$= -905\ MT$$

Thus the global TAC is adjusted as follows:

$$TAC_y^{G,2} = TAC_y^{G,1} + Z$$
$$= 3562.5 - 905$$
$$= 2657.93\ MT$$

As 2657.93 MT is 47 % greater than the previous season's TAC of 1801 MT, the maximum inter-annual TAC increase constraint of 11% is enforced, reducing the initial global TAC to 1999.11 MT.

After removing the total nearshore, subsistence and recreational allowances (376.10, 235.30 and 69.20 MT respectively), the initial offshore total TAC is 1318.51 MT, which is some 17% larger then the 2014 offshore TAC of 1120.25 MT. The 11% maximum TAC increase constraint

applies to the offshore sector (as well as to the global TAC), so that the adjusted offshore TAC is 1243.48 MT (11% increase on the 2014 value of 1120.25 MT).

The Global TAC is thus adjusted further (using 1243.48 MT as the final offshore TAC), to a final **GLOBAL TAC of 1924.08 MT**.

Comments

The global TAC for 2015 of 1924.08 MT is 6.83% greater than the 1801 MT allocated for the 2014 season.

References

Brandão, A. and Butterworth, D.S. 2015. Updated analyses of the fisheries independent monitoring survey data of the rock lobster resource of South Africa to include the 2014/15 season. DAFF document FISHERIES/2015/JUN/SWG-WCRL16.

Glazer, J.P. 2015a. Standardised CPUE indices in the West Coast rock lobster hoopnet fishery. DAFF document FISHERIES/2015/JUL/SWG-WCRL20.

Glazer, J.P. 2015b. Standardised CPUE indices in the West Coast rock lobster trapboat fishery. DAFF document FISHERIES/2015/JUL/SWG-WCRL21.

Glazer, J.P. 2015c. An index of abundance for Zone A West Coast rock lobster. DAFF document FISHERIES/2015/JUL/SWG-WCRL22.

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Table 1: The TAC values (all MT) for the 2015 season using OMP 2015. The first column reports the 2014 TAC values. The figures in parentheses indicate changes compared to the previous season's allocation. Note recreational splits between super-areas are assumed as per best information gathered from telephone surveys.

	2014 season	**2015 season**
Global T	**1801 (-16.89%)**	**1924.08 (+6.83%)**
Global A1+2	42	41.66
Global A3+4	238	257.45
Global A5+6	220	284.77
Global A7	72	80
Global A8+	1229	1260.20
Offshore T	**1120.25 (-17.41%)**	**1243.48 (+11%)**
Offshore A1+2	0	0
Offshore A3+4	118.80	138.31
Offshore A5+6	124.20	189.03
Offshore A7	72	80
Offshore A8+	805.25	836.14
Nearshore T	**376.10 (-16.61%)**	**376.10 (0%)**
Nearshore A1+2	24	24
Nearshore A3+4	65.7	65.7
Nearshore A5+6	28.80	28.80
Nearshore A7	0	0
Nearshore A8+	257.60	257.60
Subsistence T	**235.30 (-14.75%)**	**235.30 (0%)**
Subsistence A1+2	16	16
Subsistence A3+4	44.10	44.10
Subsistence A5+6	57.60	57.60
Subsistence A7	0	0
Subsistence A8+	117.60	117.60
Recreational T	**69.20 (-17.12%)**	**69.20 (0%)**
Recreational A1+2	1.66	1.66
Recreational A3+4	9.34	9.34
Recreational A5+6	9.34	9.34
Recreational A7	0	0
Recreational A8+	48.86	48.86

Table 2a: Input data for the 2015 OMP TAC calculations for super-area 1+2.

	Trap CPUE	Hoop CPUE	FIMS CPUE	Somatic Growth of 70mm male lobster (mm)
2005	-	1.404	-	2.753
2006	-	1.308	-	2.815
2007	-	1.419	-	3.880
2008	-	1.148	-	3.584
2009	-	1.578	-	7.023
2010	-	1.042	-	4.534
2011	-	0.851	-	4.197
2012	-	0.819	-	5.995
2013	-	0.934	-	3.384
2014	-	0.998	-	3.910

Table 2b: Input data for the 2015 OMP TAC calculations for super-area 3+4.

	Trap CPUE	Hoop CPUE	FIMS CPUE	Somatic Growth of 70mm male lobster (mm)
2005	-	0.486	61.63	3.600
2006	-	0.388	39.79	3.421
2007	-	0.785	39.79	2.591
2008	-	1.286	25.00	4.356
2009	-	1.365	21.32	3.656
2010	-	1.263	29.45	3.587
2011	-	1.630	19.72	3.852
2012	-	0.856	21.55	3.432
2013	-	0.974	20.23	4.027
2014	-	2.077	23.24	3.152

Table 2c: Input data for the 2015 OMP TAC calculations for super-area 5+6.

	Trap CPUE	Hoop CPUE	FIMS CPUE	Somatic Growth of 70mm male lobster (mm)
2005	-	0.790	46.00	4.156
2006	-	0.868	44.98	3.978
2007	-	1.069	39.43	3.148
2008	-	1.357	46.01	4.912
2009	-	1.116	44.75	4.213
2010	-	1.382	48.46	4.144
2011	-	1.495	35.36	4.409
2012	-	1.413	37.97	3.989
2013	-	1.325	42.73	4.584
2014	-	1.329	43.52	3.708

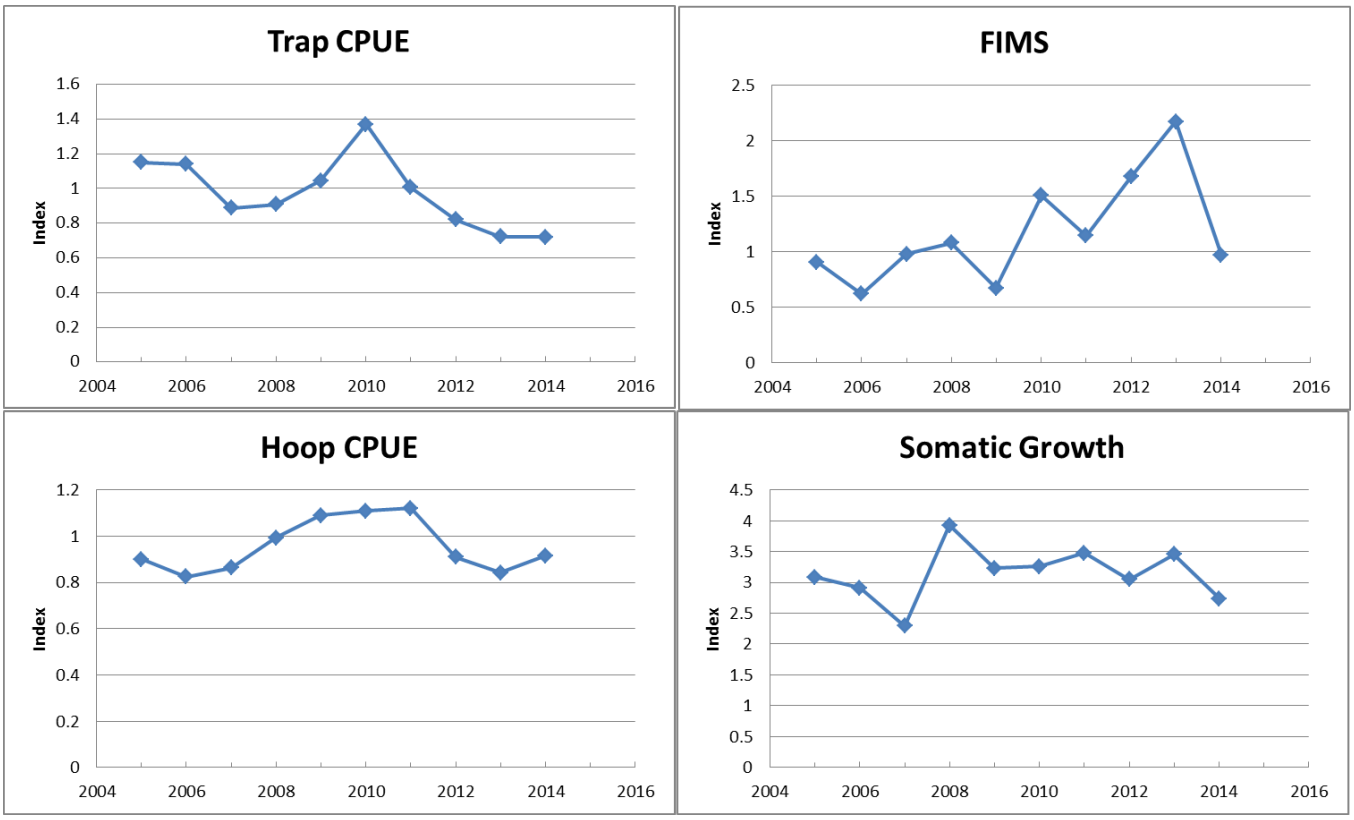
Table 2d: Input data for the 2015 OMP TAC calculations for super-area 7.

	Trap CPUE	Hoop CPUE	FIMS CPUE	Somatic Growth of 70mm male lobster (mm)
2005	0.673	-	31.60	3.249
2006	0.826	-	36.62	3.046
2007	0.501	-	36.96	3.305
2008	0.404	-	20.29	4.605
2009	0.636	-	14.41	2.983
2010	1.020	-	18.47	4.150
2011	0.355	-	30.12	4.220
2012	0.332	-	32.69	3.240
2013	0.448	-	26.25	3.243
2014	0.582	-	25.40	3.146

Table 2e: Input data for the 2015 OMP TAC calculations for Area 8+.

	Trap CPUE	Hoop CPUE	FIMS CPUE	Somatic Growth of 70mm male lobster (mm)
2005	0.982	1.103	23.78	2.633
2006	0.857	0.990	27.45	2.454
2007	0.770	0.864	29.17	1.624
2008	0.866	0.913	23.72	3.389
2009	0.871	1.054	23.44	2.690
2010	1.006	1.149	12.68	2.620
2011	1.028	1.050	19.30	2.885
2011	0.806	0.940	23.39	2.465
2011	0.596	0.778	22.95	3.060
2011	0.494	0.532	27.86	2.185

Figure 2: Indices combined across all five super-areas – used in OMP for setting TAC.



Appendix: Resource indices for each super-area compared with the threshold levels below which Exceptional Circumstances is invoked

Figures A1-A5 report the resource indices available for each super-area, the combined index that is calculated across the different indices, and finally the $J_{A,Y}$ values which are used to determine whether Exceptional Circumstances (ECs) have been triggered or not. On each figure, the bottom plot shows a solid red horizontal line indicating the "threshold" value, below which Exceptional Circumstances would be invoked.

Figures A1, A2, A3 and A5 show respectively that super-areas 1+2, 3+4, 5+6 and 8+ are well clear of their exceptional circumstances thresholds.

Area 7 has increased overall, due to the improved performance in Trap CPUE, but remains just below the threshold (Figure A4). Exceptional Circumstances for Area 7 will thus continue to be invoked for the forthcoming 2015 season.

Figure A1: Super-area 1+2 indices. The flat solid line shows the EC threshold level.

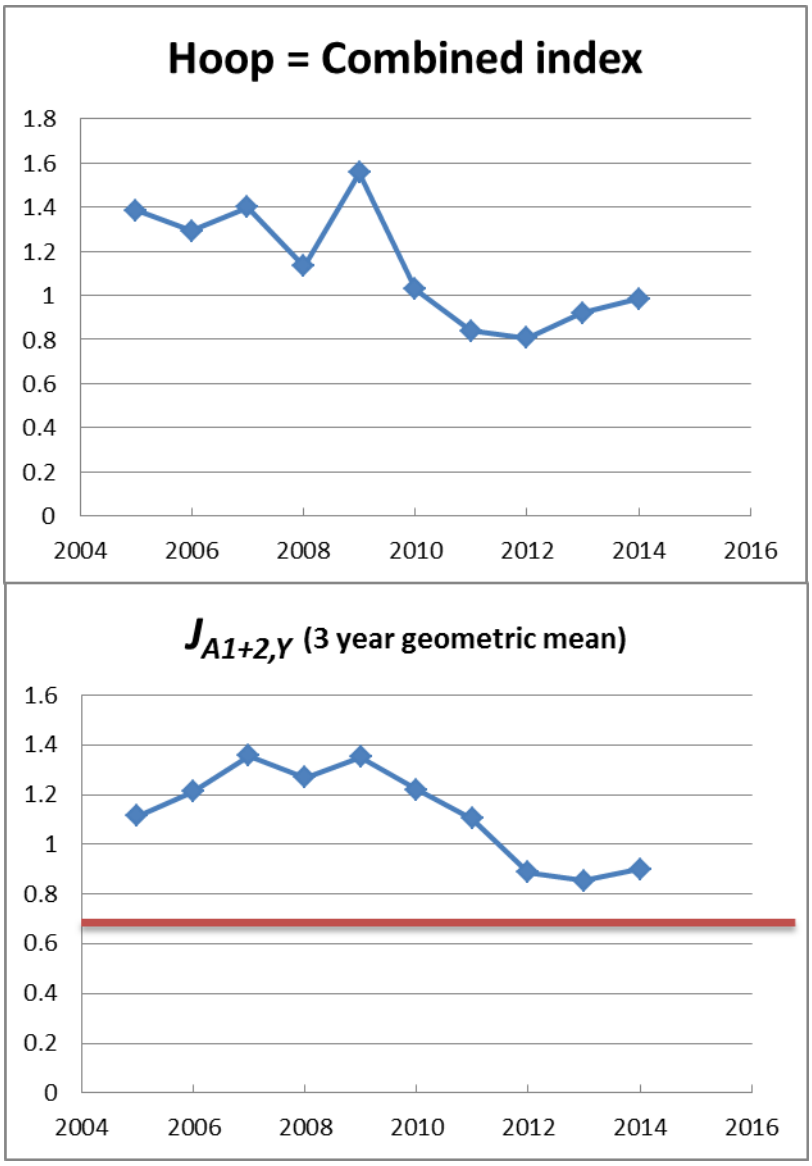


Figure A2: Super-area 3+4 indices. The flat solid line shows the EC threshold level.

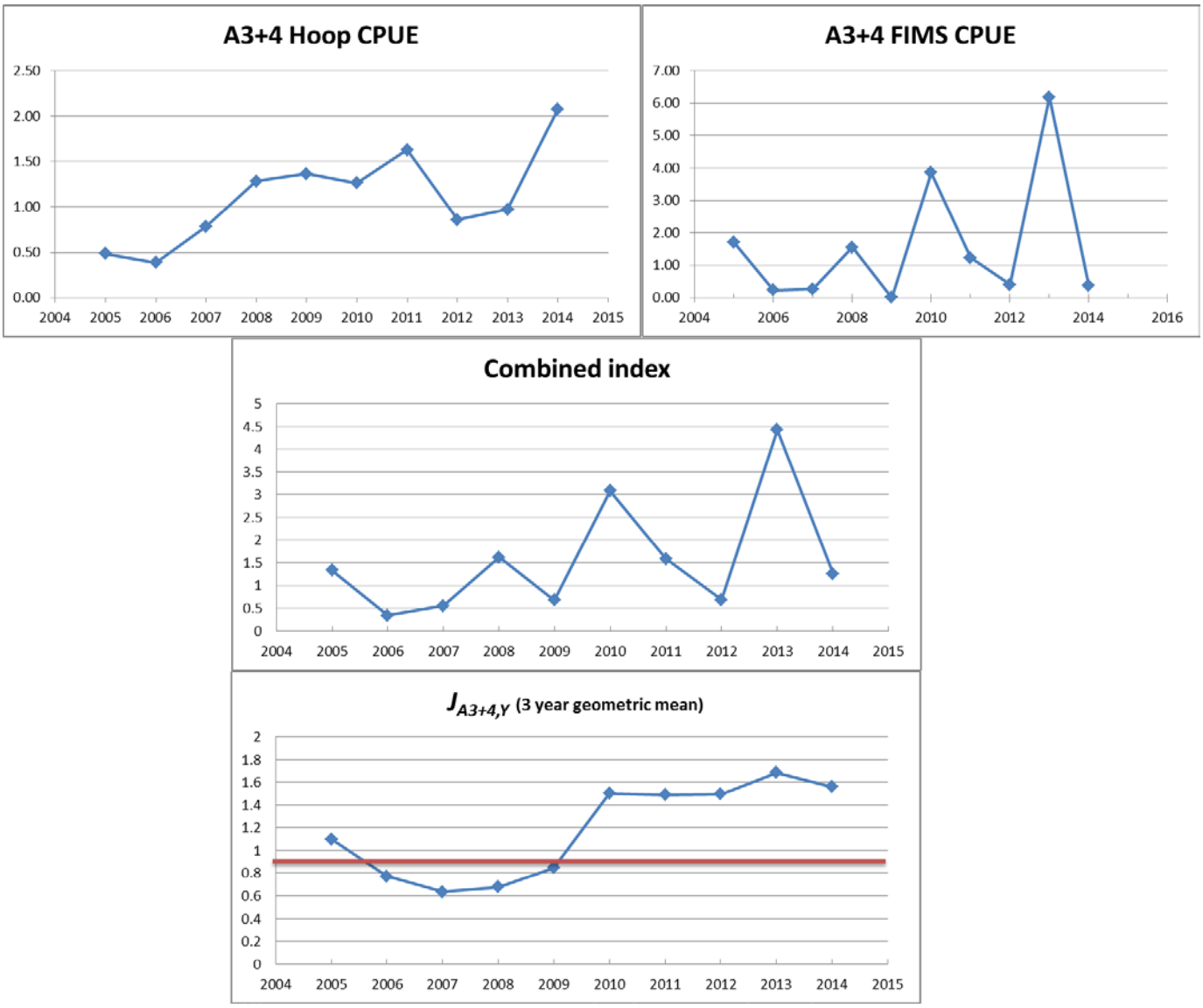


Figure A3: Super-area 5+6 indices. The flat solid line shows the EC threshold level.

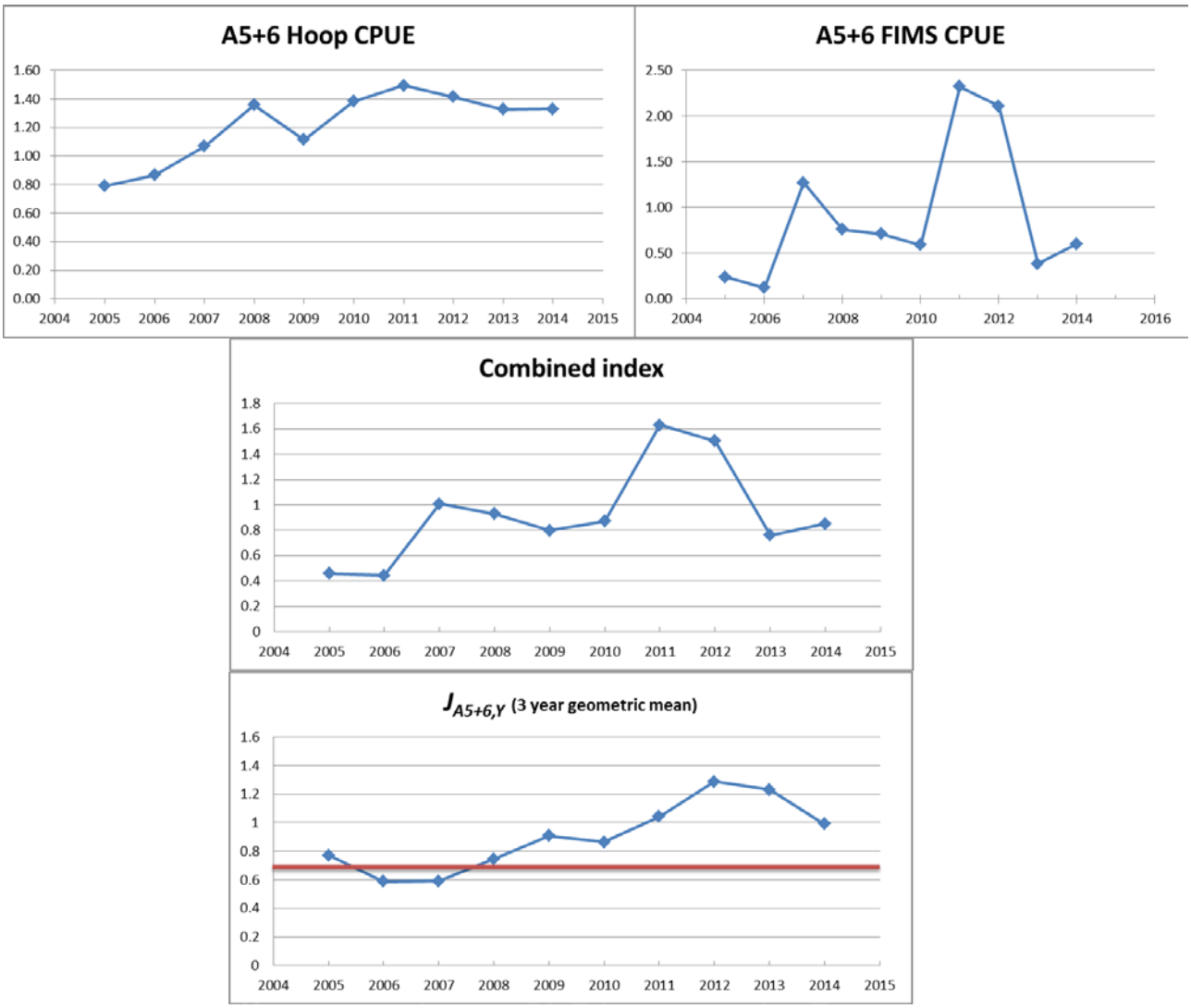


Figure A4: Super-area 7 indices. The flat solid line shows the EC threshold level.

Figure A5: Super-area 8+ indices. The flat solid line shows the EC threshold level.