

# IMPLICATIONS OF ALTERNATIVE CHOICES OF OMs FOR DEVELOPMENT TUNING TARGETS

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## SUMMARY

Questions have been raised about how the choice of OM (or group of OMs) for development tuning impacts the distribution of results across the full set of 96 OMs of the interim grid. The results for three different choices are examined for the FXP CMP for 100 tuning ( $Br30 = 1$  for both Eastern and Western stocks for deterministic projections). Although the  $Br30$  distributions for the whole interim grid shift up or down to different extents, relative to each of their medians, these distributions are unchanged for all practical purposes. This argues for using a single OM as the basis for development tuning, in the interests of simplicity of implementation.

## KEYWORDS

*Management Strategy Evaluation, Candidate Management Procedure, Operating Model grid, Atlantic bluefin tuna, development tuning*

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## Introduction

Questions have been raised about how the choice of OM (or group of OMs) for development tuning impacts the distribution of results across the full set of 96 OMs of the interim grid.

Here results are compared for tuning of the FXP CMP 100 tuning, which is  $Br30 = 1$  for both Western and Eastern stocks (for more details see Carruthers *et al.*, SCRS/2020/149) to three different (groups of) OMs:

- OM1 only (as in the aforementioned document),
- the median for the 96 OMs of the interim grid, and
- the average of five OMs – OM14, OM31, OM37, OM53 and OM89

to address these queries.

## Results and Discussion

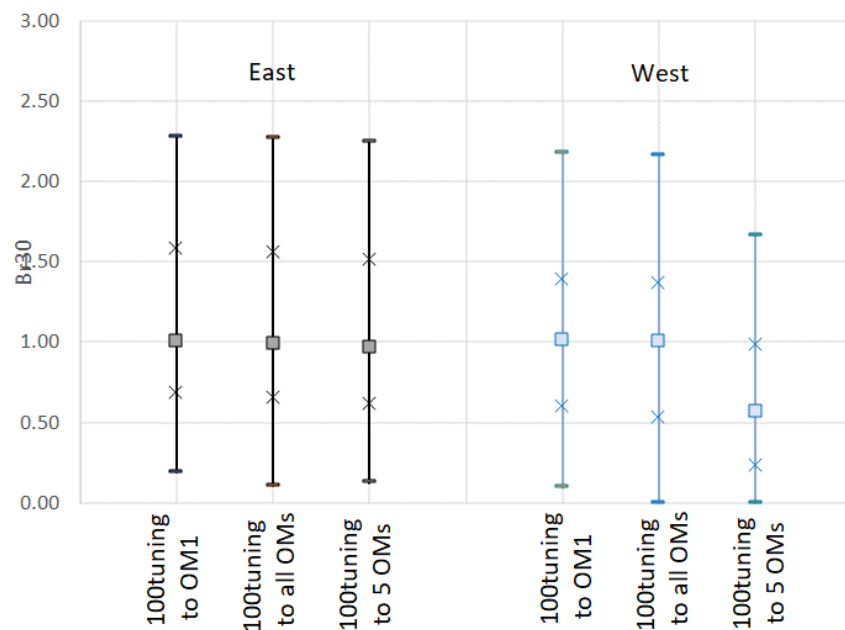
The results are summarized in Table 1 and Figures 1a and 1b. Partly serendipitously, the first two tunings are almost identical in terms of their median  $Br30$  values across the whole interim grid, but the third reflects a different catch/depletion trade-off, especially for the West area/Western stock.

For clearer comparison of the distribution of results across the interim grid, Figure 1b adjusts for the differences in median  $Br30$  values in comparing the first and third tunings to the second. For all practical purposes, the distributions are unchanged (i.e. the catch vs final population size trade-off is virtually unchanged across the different OMs).

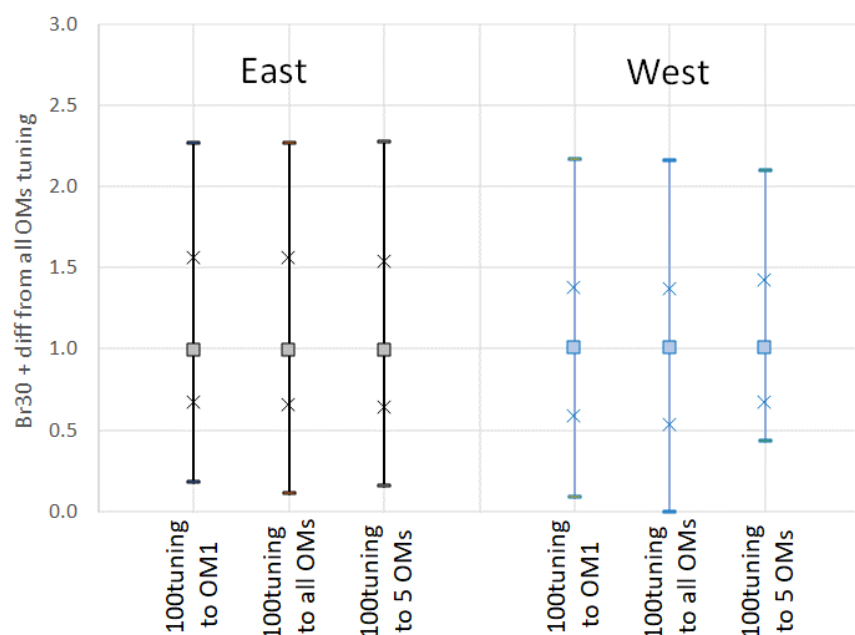
This argues for using a single OM as the basis for development tuning for simplicity and speed of implementation (in terms of computation), though see also further comments in SCRS/2020/147 concerning the choice of that OM. While tuning instead to, say, the median over the full (currently interim) grid of OMs (which yields virtually identical results) may seem more appealing/meaningful, in circumstances where tuning in two dimensions is needed, the technical overhead costs in terms of the extra time required do not seem warranted.

**Table 1:** Control parameter values ( $\alpha$  and  $\beta$ ) for each basis for development tuning,  $Br30$  corresponding to each of the OM groupings (i.e. OM1 only, median for the 96 OMs of the interim grid and average of five OMs – OM14, OM31, OM37, OM53 and OM89), median  $Br30$  for the whole interim grid for choices for tuning, and  $AvC30$  corresponding to each of the OM groupings. This is with the exception of the lower percentiles, where differences arise because of some stocks being rendered extinct for some OMs under the second and especially the third tuning.

	Tuned values of control parameters		Br30 (median or average) corresponding to the OMs in the tuning used		Br30: median for whole interim grid		AvC30 (median or average) corresponding to the OMs used in the tuning	
	$\alpha$	$\beta$	East	West	East	West	East	West
100tuning to OM1	1.300	0.565	1.00	0.99	1.01	1.02	61.19	2.77
100tuning to allOMs	1.313	0.580	0.99	1.01	0.99	1.01	47.57	1.56
100tuning to 5OMs	1.330	1.310	1.00	1.00	0.97	0.57	36.82	2.08



**Figure 1a:** Median, 5, 25, 75 and 95%iles across the 96 OMs of the interim grid, for three CMPs tuned using a series of OM groupings.



**Figure 1b:** As Figure 1a above, but with the difference between the median for each tuning and the “all OMs” tuning added to allow a reader comparison of distributions of Br30 values.