Use of the relationship between long term catch and biomass to establish a management target

by

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23 November 2017

This submission relates to the following question in MARAM_IWS_2017_Sardine_P1:

> "Can one dispense with risk and simply consider catch over the medium-to-long term as sufficient to incorporate any negative consequences of undue depletion of the population? (This because future catches should be reduced if the stock is depleted such that future recruitment drops.)"

Conventionally for South African sardine, biological risk has been defined as the probability of biomass falling below a threshold value over a 20-year time horizon. Given the high degree of recruitment variability, standard SY vs B relationships have not been used to establish a reference point for management. However, the main risk due to low biomass is low recruitment and hence low catch. The extent of this is already explicitly quantified in the relevant OM. Transients due to initial conditions are rapidly eliminated in forward simulations. Thus average catch versus average biomass over the 20 year time horizon can serve as a proxy for SY vs B, and plots of this "SY" vs "B" for B in (0,K) could help to establish a meaningful target reference point for resource management. The time horizon of 20 years can be extended if it is felt that the initial conditions are influential, or results can be limited to, say, 75% of the time horizon.