



New England Fishery Management Council

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MEMORANDUM

DATE: June 10, 2011
TO: Groundfish Oversight Committee
 Science and Statistical Committee
FROM: Augmented Groundfish Plan Development Team (APDT)
SUBJECT: **FY 2012-2014 ABCs; Update on Analytic Work**

1. During a conference call on May 18, 2011 the APDT agreed to further analyze regressions of survey index to stock size in order to evaluate the utility of using survey information to verify projected stock size (see APDT report dated May 31, 2011). One element of that work was to evaluate the ability of the projections to predict stock size using a jackknife approach. The previously distributed paper reports the results of that work. In addition, the regressions were used to predict stock size for 2008-2010 and are compared to the estimated projected stock size for the ABCs during the same period. Note that these projections used the ABC and not actual catch to project stock size for 2008-2010. For many stocks actual catch was lower and if input into the projections stock size would have been higher.

2. There are several observations worth noting.

- a) The strength of the correlation and statistical significance of the regression are not reliable indicators that the regression accurately predicts stock size in the jackknife analysis.
- b) In the jackknife analyses, none of the regressions accurately estimated stock size (that is, the estimate was within the 80 percent CI of the regression) for the missing value in more than 50 percent of the runs examined. The average percentage of accurate estimates for the stocks was 31 percent.
- c) In 21 of 42 stock/year combinations, the survey-predicted stock size confidence interval (CI) overlapped the projected stock size CI. There are four regressions where the CIs overlapped in all three years examined, and three where it overlapped in two of three years. There were five regressions where the CI did not overlap in any of the three years.
- d) The point estimate of survey predicted stock size was usually (37 of 42 instances) smaller than the projected stock size. When the CIs did not overlap, survey predicted stock size was always smaller than the projected stock size (21 of 21 instances).

- e) The divergence between survey predicted stock size and projected stock size increased over the three year period examined. For 2008, CIs did not overlap in five instances; for 2009 it was seven; and for 2010 it was nine.

3. These results are difficult to interpret without additional information on the performance of the projections. The differences between the survey predicted stock size and the projected stock size could be because of errors in either; these analyses do not identify which is incorrect. As described in a previous memo, the performance of projections will be evaluated. At that point the APDT may be in a position to conclude whether the survey can be used to verify projected stock size. Nevertheless, the APDT does believe the regression exercise supports the following preliminary conclusions.

- a. Using the regression of survey index on biomass (either January 1 or mean biomass) is not a good predictor of stock size if the confidence intervals of the regression are used. The jackknife results indicate that the CI of predicted stock size is unlikely to capture actual stock size. The 80 percent prediction interval is likely to capture the actual stock size but this is because the interval is so wide that the results are not informative.
- b. While the regression may not be a good predictor, the surveys still appear to be informative. Survey trends appear to match stock size estimates (as they should since they are a model input) and may prove useful in evaluating when actual stock conditions may deviate from the projected stock size.
- c. While the regressions are not a good predictor of stock size, the fact that almost all of the 2008-2010 biomass predictions based on the regression are lower than projected stock size suggests there may be a bias in the projections.

4. Even if the regression approach for estimating stock size that was planned is determined to be unreliable, that may not mean that there is no useful information in the surveys that will help in the setting of ABCs. The APDT intends to examine this in additional detail. For example, if a survey trend exists it could be compared to the projection and decision rules developed to guide catch advice.

5. The planned approach for setting ABCs is to base them on projections from the most recent assessments and use the surveys to indicate when stock conditions differ from the projections. When this occurs the concept was that the survey might inform the decision on modifying catch advice from that derived from the projection. Given the results of the regression analyses there is a distinct possibility that this planned approach may not prove fruitful and the APDT will explore other alternatives. The APDT welcomes SSC suggestions on alternatives to consider.