

TMGC Questions/Feedback – 2026 TSC Meeting

TMGC questions and feedback in black text. Responses in blue text.

Surveys

- The TSC meeting considered several US and Canada survey questions related to:
 - Determination criteria for inclusion/exclusion of survey data points in anomalous survey years (e.g., low/missing spatial coverage, survey timing, clustered sampling, etc.)
 - Number of annual tows completed vs. average time series tows
 - Model diagnostics and performance criteria for determination of inclusion/exclusion of anomalous years
 - Which strata are included in:
 - US and CAN assessment models and how to consider changes over time (e.g., survey w/ and w/o catch data; strata 29/30)
 - Resource sharing allocation calculations
 - US consideration of biomass distribution between WGB and EGB
- The TMGC requests that the ISATS Report fully document the application of the 2025 NEFSC Fall Bottom Trawl Survey with details for including or excluding the index for the following:
 - Domestic stock assessments
 - Resource sharing calculations
 - Survey biomass distribution (US only)
- Documentation regarding the inclusion or exclusion of the 2025 NEFSC Bottom Trawl Survey data has been added to the sections within the TSC report that describe the models for EGB cod and haddock and GB haddock (pages 3-5), as well as the sections that describe the allocation shares calculation and survey-based distribution analysis (pages 8-9).

Model Assumptions

- The TSC meeting described different applications of several model parameters, including:
 - Natural mortality (M)
 - Recruitment (R)
 - Fleet structure

- Survey and fleet selectivity
- Model selection criteria (e.g., NAA, RE, AIC, etc.)
- In the current, separate but equal, domestic stock assessment process, TMGC requests additional information on:
 - How different assumptions of M and R affect model performance, results, and projections
 - M and R parameters have strong interactions within assessment models, as well as interactions with F and other key parameters, so it is not possible to draw conclusions about direct effects of specific M or R assumptions or estimates alone, without accounting for those strong interactions with other parameters in the models. Interactions between M, R, and F and other parameters were explored for each assessment model and peer reviewed. The best sources for information on detailed explorations of these parameters, interactions, and effects on performance, results, and projections are the cod and haddock research track and framework reports. The cross-model comparisons section in the TSC report text also provides additional context for likely M and R effects (pages 6-8).
 - How Process Error is applied to all models with explanations of the processes that may be masked and how removal of process error would influence retrospective patterns
 - The specific applications of process error modeling for the cod and haddock assessments are listed in the comparison tables in Appendix 1 of the TSC report (Tables A1.1 and A1.2). Modeling process error has been shown to produce improved estimates in simulation studies, even when an incorrect process error is modeled. Inclusion of one process error does not imply other process errors are masked, instead it provides flexibility to the model to account for the missing process error. Generally, models that include process errors tend to have smaller retrospective patterns compared to models that do not.
 - Haddock:
 - How does the EGB model high M and high R assumptions reflect biological plausibility?
 - The EGB haddock model estimates a time- and age-invariant M ($M = 0.508$) in a time block since 2010. Extensive exploration and sensitivity analyses were conducted and support high apparent mortality in this time block. This mortality is captured by M for the EGB model but likely encompasses more than natural mortality

(e.g., movement, ageing errors, mis-specification of selectivity), processes similarly captured through random effects on NAA.

- The EGB model estimates recruitment, which is known to be highly variable with spasmodic recruitment events leading to large cohorts. The influence of recruitment on the short-term model projected SSB and catch advice is minimal since age-1 recruits contribute little to SSB and the fishery in 2 years.
- How does the GB model's stable SSB reflect declining trends across all survey indices?
 - The GB haddock model estimates of SSB exhibit strong decreases since the mid 2010s, consistent with all survey indices, and show stability or slight decreases in SSB in the last few years, similarly consistent with the survey indices.
- Provide additional details about WAA estimates declining while density-dependent influences have declined.
 - Neither assessment model incorporates density-dependence in the estimation of WAA. With declining population density, there is an expectation that density dependence influences have decreased, but neither model explicitly evaluates this. We also have seen changes in WAA in other stocks that would not be expected to have density dependence. Bottom line, the underlying cause of WAA changes in this stock is not known.
- Collectively, provide more detail about how the GB and EGB assessments are portraying different outlooks for the stock in the short-term.
 - Both assessment models show the stock SSB declining from 2025 through 2027 (Table 2 in the TSC report). The relative steepness of that decline may differ between the two assessments, however the assessments are also evaluating different areas. The cross-model comparisons section in the TSC report text highlights key model differences that likely contribute to any apparent differences in trends (pages 6-8).
- Cod:
 - Provide more detail about the NAA residuals showing only positive and highly patterned trends within ages.
 - The positive and highly patterned trends in NAA residuals within ages are related to the trends in NAA random effects. The reason there are highly patterned trends within ages is that the model

assumption of M (Lorenzen M) is mis-specified and does not accurately account for the loss/gain of fish in the population. This is why the MSEtool portion of the model converts the random effects on NAA to an estimate of Apparent M (combined annual M and unexplained changes in the numbers at age).

- How do the recruitment assumptions in the GB and EGB models affect overall F and what management tools could be applied to address continued declines in recruitment?
 - Neither model includes a direct link between R assumptions and F . R assumptions and estimated R interact with many other parameters in the assessment models, so inferring any direct connection with F is not possible. Quantitative comparisons can be made only between the EGB and GB model configurations which were presented at the DFO Framework peer review (not between the current accepted Canadian and US models). In that comparison, the R assumption did not make a substantial difference in the biomass estimates for those two models, so the bulk of differences in F between EGB and GB in the models compared at the Framework review appeared to be driven by catch differences rather than R differences.
 - The causes of low recruitment are unknown, so we are not able to identify which management tools would best address those unknown underlying causes.
- Provide input on management's ability to continue to support sustainable fishery management measures for the GB and/or EGB cod stock.
 - We recognize the challenges facing cod management with low biomass, low realized F in multispecies fisheries, and an apparent lack of population response to low F . Both cod assessments provide catch advice intended to meet sustainable fisheries mandates for their country.

Process

We appreciate the TMGC's comments and recommendations on the overall process and suggest that the TMGC and science team consider these as we work together to continue to improve the TMGC process.

- The TMGC recommends the following for consideration in the TMGC Process Review:

- Conduct a review of the effectiveness of separate domestic science processes and products, the TSC meeting process, and the utility of the ISATS report for use in management
- Allowance of interactions between TMGC members and stock assessment scientists/TSC meeting participants
- Allowance to review the draft ISATS report prior to final delivery
- Prioritization of the TMGC negotiation process as the primary driver for scientific support
- Survey topics:
 - The TMGC recommends consideration of the following survey topics in the TMGC Process Review and future iterations of domestic models, resource sharing allocations, and survey biomass distribution:
 - Inclusion of all available information
 - VAST models to include surveys that do not cover entire range (e.g., DFO survey for haddock)
 - Consideration of survey timing and environmental drivers on stock distribution/abundance
 - Standardization of survey indices for bottom temperature and day length
 - Side-by-side comparisons with industry-based information
 - Alignment and agreement of survey strata applied to all processes
- Assessment approach:
 - The TMGC recommends consideration of the following assessment approach topics in the TMGC Process Review and future iterations of US-Canada bi-lateral management for TMGC stocks:
 - A joint approach to reconcile the differences in model assumptions
 - A joint peer review of models to provide a scientific basis for management advice of the bilateral stocks
 - Consideration of stock structure for cod and haddock