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Staff comments on review of “Short-term economic impacts of Framework Adjustment 21”
UMASS study prepared by Dan Georgianna

1. Please keep in mind that the Council must follow Office of Management and Budget (OMB) guidance in analyzing alternatives and providing a different type of analysis can cause confusion.
2. The overall benefit and costs of the fishery management actions generally vary over time depending on the rate of growth of the stock and according to the nature of management measures implemented to maximize the yield from fishery. Although a **general guideline for the period of analysis** cannot be established for all fishery management actions due to the diversity of possible situations and measures to be dealt with, the Guidelines state that “the period of analysis could reflect the time it takes for the fishery to move from its initial equilibrium along the expansion path to the final equilibrium point (including the time needed for the present value of costs and benefits to approximate zero) due to the adoption of the proposed regulation, holding all other influence constant.” In addition, the Guidelines indicate that “a reasonable attempt should be made to conduct the analysis over a sufficient period of time to allow a consideration of all expected effects”.

Since the benefits from the Framework 21 management action are expected to be realized over the long-term but will have some negative impacts during the first year, Section 5.4.2 examines both the short-term (fishing year 2010 only) and the long-term (2010-2023) economic impacts of the proposed regulations over the next 14 years. The long-term is divided into two sub-periods: near-term from 2010 to 2016 and longer-term from 2017 to 2023. The first period is considered to have less uncertainty in terms of biological and economic factors that impact landings and economic benefits compared with the last seven years from 2017 to 2023 and equals the amount of time the closure alternatives would impact the results. The present value of long-term benefit and costs are estimated using both a 3% and a 7% discount rate. The higher discount rate provides a more conservative estimate and a lower bound for the economic benefits of the proposed action compared with the No Action scenario and compared with the benefits predicted using a lower discount rate. Please see point 4 below for more explanation.

Reference: OMB Circular A-4 (September 17, 2003), http://www.whitehouse.gov/omb/circulars_a004_a-4/

3. In terms of defining **how alternatives should be compared**, the Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) ^[1] state “the proper comparison is ‘*with the action*’ to ‘*without the action*’ rather than to ‘*before and after the action*,’ since certain changes may occur even without action and should not be attributed to the regulation.” Even without action, the scallop stock abundance in open and access areas will be different, requiring changes in open area DAS and trip allocations in order to maximize yield from the fishery over the long-term. As a result, landings, scallop prices, fishing costs, revenues and benefits from the fishery would change. **For these reasons and in accordance with the NMFS Guidelines (NMFS, 2007), the cost-benefit analyses**

presented in Section 5.4.2 compare the economic benefits of the proposed measures with the “No Action” scenario rather than with previous benefits or with economic impacts compared to 2009 fishing year.

Reference: Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions, March 2007, http://www.nmfs.noaa.gov/sfa/domes_fish/EconomicGuidelines.pdf

The **no action** scenario is defined by NMFS as “the continuation of all the measures including the open area DAS and access area trip allocations as specified in the present regulations, i.e., in Framework 19.” The economic impacts of the proposed measures are compared with no action according to this definition. No action landings were estimated to be 50 million lb. As a result, the economic analysis estimated that the revenue per full-time vessel would decline by 13%, by about \$128,224 (see IRFA section, Table 134) compared to no action landings.

The short-term economic impact analysis prepared by Dan Georgianna compares the economic impacts of the proposed F21 action with ‘before action’ scenario (2009) assuming that the fleet landings will amount to 56 million lb. in 2010. It was assumed that average price for scallops will equal to what was predicted for no action even though no action landings (\$7.07 for 50.4 million lb.) are estimated to be considerably less than the level of landings for 2009. It must be kept in mind that the average price per pound of scallops were about \$6.45 in 2009 corresponding to 56 million of landings and were about \$7.00 per pound in 2008 when landings were considerably less (52.3 million lb.). In addition, this study estimated revenues assuming an inflation rate of 2% for 2010. As a result, projected revenue losses are double of what would happen under no action and compared to the estimated results in economic analysis that presented results in terms of 2008 prices.

- 4. As Dan Georgianna stated, his analysis “does not account for any changes in stock size, stock composition or in any other biological variables”.** There is no guarantee that the scallop fleet would land 56 million lb. in 2010 even if they were allocated 5 access area trips and same number of open area DAS as in 2009. Similarly, comparing the economic impacts of 56 million lb. of actual landings with the 42 million lb. of estimated landings for the proposed option could be misleading. As Dan acknowledged, the estimated landings from the biological model was 46 million lb. in 2009 but the actual landings will probably be over 56 million lb. The actual landings for 2010 are likely to be different than the estimated landings for the proposed alternatives estimated by the biological model. **This points out the problem of comparing projected landings and economic benefits with the actual landings from a year ago.** If the short or long-term impacts of the proposed action were to be characterized with this method, i.e., relative to the previous year, the impacts would be artificially negative (positive) if the biological projections underestimated (overestimated) the landings and price model underestimated (overestimated) the prices.

Therefore, for the consistency of the economic cost benefit analysis, it is important to compare estimated landings for the proposed action with estimated landings for a higher F scenario from the biological projections, not with actual landings from the previous year. It should also be noted that the uncertainties about the short- and long-term

fishing mortality and the status of the scallop biomass and the uncertainties related to the biological projections would also increase the risks associated with the high-F options. If the fishing mortality was higher than estimated in the biological model, however, the proposed action will minimize the risks of overfishing and reduction in the stock size and yield over the long-term compared to the high-F option.

5. **Focusing only on the short-term impacts and not including a long-term analysis contradicts the guidelines specified by NMFS (2007) and in OMB Circular (2003) for the period of economic cost/benefit analyses. It also overlooks the short-term impacts of fishing on long-term landings and economic benefits from the fishery.** NMFS guidelines state that “a reasonable attempt should be made to conduct the analysis over a sufficient period of time to allow a consideration of all expected effects”. Similarly, the Office of Management and Budget (OMB, 2003) indicated that the analyses should “present the annual time stream of benefits and costs expected to result from the rule,” and state that “the beginning point for your stream of estimates should be the year in which the final rule will begin to have effects” and “the ending point should be far enough in the future to encompass all the significant benefits and costs likely to result from the rule.” **Therefore, focusing on economic impacts only in 2010 or just for a three year period from 2010-2012 (as was done in the Georgetown study submitted to NMFS from Fisheries Survival Fund) fails to take into account the economic benefits from a risk averse action (i.e., $F=0.20$) compared to a high-F option ($F=0.24$).**
6. **One of the reasons shown for focusing only on short-term impacts is that “FW 21 was intended to set catch limits for 2010 only, not future years”.** Although it is true that FW21 measures will be applied for 2010 only, this fact does not justify that the impact of the management action should be considered for only one year because the impacts of fishing on the stock biomass and yield will extend to the future years. **The UMASS study does not take into account how the removal of an extra 6 million lb. of scallops (compared to no action of 50 million lb.) would impact the future landings and the size composition of landings.** For example, one reason why the average scallop price in 2009 was lower than 2008 fishing year was the decline in U10 scallop landings. These are the reasons why both NMFS and OMB guidelines specify that the period of analysis should include “far enough in the future to encompass all the significant benefits and costs likely to result from the rule” and that, “because fishery management actions in general result in short-term costs for the industry in terms of foregone revenue, choosing a period of analysis that is too short may bias the analysis toward costs, where costs are incurred in the short-term and benefits are realized later.” (NMFS, 2007, section IV.5.c). Therefore, it is important to consider long-term effects of any action in order to maximize the economic yield to the nation from the fishery resources.
7. **Although regional economic impacts are important, the OMB Guidance stipulates that the most appropriate method for comparing alternatives is cost-benefit analysis which takes into account the changes in the fishing costs and consumer benefits as well as the changes in producer benefits net of no action alternative.** For example, the proposed action and the alternatives are expected to reduce the trip costs compared with both to the previous fishing year and compared to ‘no action’ levels, but the UMASS study does

not take these cost savings into account either in the short- or the long-term. While it is true in the short-term, the status quo F ($F=0.20$) option would reduce total economic benefits for the nation by about \$41 million, the benefits were estimated to increase by \$56 to \$63 million from 2011 to 2016. UMASS study does not take into account the regional impacts of this increase. With the high-F option ($F=0.24$) the economic benefits would decline by only \$5million in 2010, but are estimated to stay at the same levels from 2011 to 2016 compared to no action. As a result, the status quo F ($F=0.20$) option would increase net economic benefits to the nation by \$15 to \$22 million over the period 2010 to 2016 while the high-F ($F=0.24$) would *decrease* benefits by \$5 million for the same period compared to no action. It should be noted that these estimates do not include future inflation and if the prices were adjusted assuming an increase in price by 2% each year as was done by UMASS study, the estimated economic benefits would be higher than these numbers.

In short, the economic impact analyses based on 2010 fishing year only fail to consider these trade-offs between the short-term and long-term benefits. In addition, while UMASS study emphasizes the short-term regional impacts on the decline in landings, no consideration was given to the positive regional impacts with higher landings, revenues and net economic benefits for 2011-2016 and long-term impacts from 2010 to 2023 with the proposed option ($F=0.20$).

Short Term Economic Impacts of Scallop Framework 21

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Introduction

On 18 November 2009, the New England Fishery Management Council (Council) voted to reduce fishing effort by cutting days at sea and eliminating one trip in the closed areas for 2010 in Framework 21 (FW 21) to the Atlantic scallop fishery management plan. This paper presents a economic impact analysis for 2010 that estimates the loss in landed value per full-time limited access scallop vessels from FW 21 as compared to other options using estimated landings and prices for 2009 and 2010 from the FW 21 documents prepared by Council staff. The analysis also adapts models developed by the Northeast Regional Science Center (Science Center) to estimate the overall impact on sales, income, and employment on the Northeast Region of the U.S. generated by these losses in exvessel revenues.

The document presents a background on FW 21, a discussion of the different applications of status quo, estimates of the loss in revenue per vessel relative to different options, and overall impacts on the region from these estimates of losses in revenue. While some familiarity with scallop fishery management and economic impact analysis are helpful in understanding the analysis, I have tried to write this for as wide an audience as possible.

Background on Framework 21

At their November 2009 meeting, the Council approved Scallop Fishery Management Plan Framework 21 (FW 21) that set specifications to adjust the day-at-sea (DAS) allocations and an area rotation schedule for the 2010 fishing year (FY 2010: March 1, 2010 to February 28, 2011). The Scallop Plan Development Team (PDT) presented the Council four scenarios. The first scenario (called "status quo") set the Annual Catch Limit at 42 million pounds that would be accomplished through a maximum of 29 DAS in the open areas and four closed area trips (two in the Elephant Trunk Area, one in Delmarva Area, and one in the Nantucket Lightship Closed Area) for full-time limited access vessels. The second scenario set the Annual Catch Limit of 48 million pounds that would set a maximum of 38 DAS in open areas and the same set of closed area trips as the first scenario. Scenarios three and four included closing an additional area to scalloping that was not recommended by Council committees and will not be consider further in this analysis.

At the Council's Scientific and Statistical Committee (SSC) meeting in September 2009, the SSC set the Acceptable Biological Catch for FY 2010 at 58 million pounds for the

overall fishery (a fishing mortality rate of .29), after deductions for discards and incidental mortality. This was estimated as the catch associated with a 25% probability of reaching the overfishing limit of 80 million pounds. In 2007, the most recent stock assessment for sea scallops established that the U.S. Atlantic scallop resource was neither overfished nor was overfishing occurring (Science Center, 45th SAW, p. 141). The SAW established the overfishing threshold at fishing mortality of 0.29, an increase from the previous overfishing threshold of 0.24.

In preparation for the meeting of the Council, the Council staff, in consultation with the National Marine Fisheries Service (NMFS) presented an Economic Impact document that estimated the long run economic impact for the four scenarios that included estimated landings, revenues, and prices for 2010 through 2023. The Council staff's analysis showed lower landings and revenues in 2010 for the "status quo" compared to the other scenarios but slightly higher landings and revenues for subsequent years. Using a discount rate of 7%, the report estimated that the present value of the "status quo" was less than 1% higher than the present value from the second scenario over 2010 through 2016 and over the longer period (2010 through 2023).

Based on these documents and the discussion during the meeting, the Council set the catch at the "status quo" option that would limit the full-time limited access scallop vessels to four trips in closed areas and 29 DAS in the open areas. This recommendation went to the Regional Office of NMFS, which will present its recommendation to NMFS headquarters and eventually to the Secretary of Commerce.

Meaning of Status Quo

With regulations codified in several Federal and state laws, marine fisheries are probably one of the most regulated industries in the U.S. Federal laws, especially the Magnuson-Stevens Act (Act) as Amended in 2007, intended fishery management as open political processes, with all of the complexities that such political processes generate. While the Act refers to regulations based on science, political rhetoric often rules. Such is the case with the term status quo, a powerful concept in U.S. jurisprudence and less formal means of persuasion, which in general means the state of affairs that existed previously, but implies a fall back position that puts the burden of proof on alternative proposals to show significant improvement over status quo. The choice of which aspect of the state of affairs that existed previously to use as status quo also has rhetorical significance.

Three different applications of status quo have been used in recent framework adjustments to the Scallop Fishery Management Plan. In FW 16 (July, 2004), which specified the rotation schedule in the closed areas, status quo referred to the regulations that existed previously. For FW 16, status quo specifically meant, the maximum number of DAS that existed before FW 16 with no access to closed areas (Council, FW 16, p. 6-1).

FW 18 (December 2005) applied status quo to the fishing mortality set by the Council as a management target to approximate maximum sustainable yield (MSY) (Council, FW 18, p. 3-9). FW 18 set status quo as the overfishing limit for scallops based on the most current stock assessment reduced by 20% to ensure that management error would not result in overfishing. In 2004, the Stock Assessment Workshop (SAW) had established an overfishing reference point at fishing mortality of .24 (Science Center, 39th

SAW Summary, p. 15). Reducing this by 20% would result in management regulations that would limit fishing mortality to .20, which was the status quo set by FW 18.

FW 19 (December 2007) applied status quo to the management target fishing mortality (.20) from the previous framework (FW 18) without updating the target fishing mortality from the most recent assessment. As noted above, SAW 45 in June 2007 increased the overfishing threshold to fishing mortality of .29 based on its more recent data on fishing selectivity, meat weight, and growth. Following the logic of FW 18, reducing this limit by 20% to account for error would increase the management target fishing mortality to .24. FW 19 referred to status quo as target fishing mortality of .20, however. Status quo went from a fishing mortality based on management target to achieve MSY in FW 18 to an invariable fishing mortality point estimate of .20. In response to a comment in the FW 19 Final Rule that argued that the increase in biomass estimated by the SARC warranted a higher catch limit, NMFS responded that the lower limit adjusted fishing mortality for localized overfishing, which was consistent with the Act (US DOC, FW 19 Final Rule, p. 30796).

The Council's recommendation for FW 21 used the third aspect of status quo, a fixed fishing mortality without updating the management target fishing mortality with even more recent information on stock biomass and the higher fishing mortality that would maintain MSY. The Council was presented and chose a status quo of fishing mortality of .20, even though the SSC had recommended two months before an overfishing limit fishing mortality of .37 and an Acceptable Biological Catch fishing mortality of .29, which the SSC estimated was within 25% probability of reaching the overfishing limit (Council, FW 21, p. 20).

FW 21 documents include an analysis of a No Action alternative, which was considered separately from status quo in FW 21. Under No Action, the limited access vessels would lose two closed area trips on Georges Bank because no trips would be allocated for these closed areas.

Economic Impacts of Framework 21

The following impact analysis compares the Council's recommendation, which I identify as FW 21 status quo with Regulations status quo and MSY status quo. FW 21 status quo is expected to yield 42 million pounds. Regulations status quo refers to regulations that existed in FY 2009, which in this case means 37 DAS in open areas and five closed area trips for full-time limited access vessels. In FY 2009, these regulations were estimated to yield 56 million pounds for the fishery, which I assume would be caught in 2010 with the same regulations that were in place in 2009 (Council, Framework 21, p. vii). MSY status quo refers to the fishing mortality rate of .24, which is 20% less than the ABC set by the SSC and the overfishing threshold from SARC 45 as a buffer for management error. This translates to 38 DAS in open areas and four closed area trips, which is expected to yield 48 million pounds.

The most complete set of data is from FY2007. These were the data used in the IMPLAN model by Science Center staff to assess the regional impacts of the changes proposed in Amendment 15 to the scallop FMP. The most recent Framework 21 document estimates landings for 2009 at 56 million pounds. Rather than use data from 2007, I

decided to scale the expected landings for 2009 by the factors in the 2007 data to give a more accurate picture of the changes in regulation status quo. Specifically, I used the number of full-time limited access vessels and their share of total landings from 2007 to estimate loss in revenue per vessel (Science Center, Analysis of Shoreside Impacts of Permit Stacking, p. 3). I used the multipliers from 2007 to estimate overall impacts on the Northeast Region (Ibid, p. 8). Using the 2007 data for landings would show a larger loss from FW 21 compared to the Regulation status quo.

The following analysis does not account for any changes in stock size, stock composition or in any other biological variables. Framework 21 documents state that all scenarios presented to the Council would maintain biomass at sufficient levels to maintain MSY. The documents do not make such claim for continuing the catch at the 2009 rate of landings. Higher fishing mortality may reduce the yield per day in the open areas either through a reduction in scallops on the sea floor or a reduction in the average size of scallops.

The table below shows the short-term economic losses for FW 21 compared to the Regulation status quo and the MSY status quo. Estimated landings for 2009 by limited access full-time vessels were used for the Regulations status quo in comparison to FW 21 in estimating the loss per vessel from FW 21. The number of limited access full-time vessels (252 from Northeast Fishery Science Center) was assumed the same under each scenario. Exvessel prices for 2010 were taken from Framework 21 for each of the scenarios adding 2% inflation per year to adjust prices from 2008 to 2010. The estimated price for No Action from Framework 21 was used as the estimated price for the landings associated with Regulation Status Quo.

Economic Losses from Framework 21 to the Scallop FMP Compared to Regulation Status Quo and MSY Status Quo

	Regulation Status Quo	MSY Status Quo
Annual Value of Landings Per Limited Access Full-Time Vessels	\$263,931	\$123,265
Regional Impacts		
Sales	\$230,305,986	\$107,560,933
Income	\$129,359,013	\$ 60,416,174
Employment	1,289	558

Regional impacts show the overall effects of the reduction in landings for 2010 from FW21 using the multipliers for direct and indirect effects (expenditures from scalloping) from scallop harvesting on the Northeast Region from the Science Center. These were calculated from IMPLAN Pro using data for income and costs from scalloping in 2007. In order to capture some of the induced effects from scalloping, I added the effects of wholesaling on sales and income taken from multipliers associated with wholesaling of groundfish, which was also supplied by the Science Center. I did not include the induced effects of processing because most of the processing of scallops is done on board. Scallops also add value to sales and income at the retail level in supermarkets and restaurants, but there are no data from which to estimate these effects.

For employment, I used the baseline employment for direct and indirect effects for 2007 from the Science Center multiplied by the percentage loss in landings to estimate the direct and indirect loss of employment. I added the direct and indirect loss of employment from wholesaling. These are a guess, at best. There are essentially no data for employment in fishing; only the number of crew per trip is collected by NMFS. The Science Center's analysis assumes that more than 2/3rds of the full-time scallop vessels share crew and assumes that all crew are steady men on the vessel. This probably underestimates the employment in scalloping. Georgianna and Shrader (p. 188) estimated employment at 1,449 on 105 New Bedford full time scallop vessels in 2002, using settlement house data. They estimated that about ½ of the employment on scallop vessels was part-time.

Conclusions

This analysis predicts substantial losses in annual revenue per full-time scallop vessels (about 25% of revenue for 2009) and substantial losses in total effects to the Northeast Region. The losses in total effects were probably underestimated because they do not include losses from on-shore processing and retail sales.

In recent years, actual scallop landings have usually been higher than those predicted by the models used in the frameworks. For example, in 2009, preliminary estimates from Framework 21 expect landings about 10 million pounds higher than the models predicted (Council, FW 21, p. vii). Higher than predicted landings would mitigate at least some of the losses expected by this short-term economic impact analysis, but raise questions about the efficacy of scallop management. In 2008, more than ½ of landings per full-time limited access vessels came from the closed areas. About the same results are expected in 2009. Therefore, the overages of landing were due to higher than predicted landings in the open areas. The most likely explanation is that biomass was higher than calculated by the frameworks model in the open areas. The results from both SARC 45 and the SSC support this hypothesis. Rather than evidence for reducing the catch limits, as stated by FW 21, the excess of actual over predicted landings may indicate reasons for increasing catch limits.

The results from this short-term impact analysis are very different from the analysis of long-term effects done for FW 21, which showed modest improvements in revenues and producer and consumer surpluses from 2010 through 2023 compared with the higher management target fishing mortality of 0.24 (referred to as MSY status quo). Short-term analysis is preferable to long-term analysis for several reasons. The long-term analysis is based on a biological model that has not proven very reliable in the past, which predicts a

sharp increase in landings in 2011. Short-term analysis is preferable to long-term analysis also because FW 21 was intended to set catch limits for 2010 only, not future years. The history of scallop management indicates that frameworks change substantially every two years. The length of time over which to estimate benefits strongly affects the results. Using the analysis from FW 21, Georgetown Economics shows that over a three-year period (2010 - 2012) the present value of benefits from the higher fishing mortality ($F=0.24$) surpasses the benefits from the fishing mortality chosen by the Council ($F=0.20$).

References

- Georgetown Economics. 2009 An Assessment of the New England Fisheries Management Council's Economic Impact Report. <http://www.savingseafood.org/economic-impact/an-assessment-of-the-new-england-fisheries-management-council-s-economic-impact-r-3.html>
- Georgianna, D. and D. Shrader. 2008. "The Effects of Days at Sea on Employment, Income, and Hours of Work: Some Preliminary Evidence" *Human Ecology Review*. Vol. 15:1.
- New England Fishery Management Council. 2009. Framework 21 to the Atlantic Sea Scallop FMP, including an Environmental Assessment, an Initial Regulatory Flexibility Analysis and Stock Assessment and Fishery Evaluation (SAFE) Report.
- New England Fishery Management Council. 2009. Economic Impacts. Mimeo (See <http://www.nefmc.org/scallops/index.html> November 17-19, 2009 Council Discussion Documents).
- New England Fishery Management Council. 2007. Framework 19 to the Atlantic Sea Scallop FMP Including an Environmental Assessment, an Initial Regulatory Flexibility Analysis and Stock Assessment and Fishery Evaluation (SAFE) Report.
- New England Fishery Management Council. 2005. Framework Adjustment 18 to the Atlantic Sea Scallop FMP including an Environmental Assessment, Regulatory Impact Review, Regulatory Flexibility Analysis and Stock Assessment and Fishery Evaluation (SAFE) Report.
- New England Fishery Management Council. 2004. Framework 16 to the Scallop FMP and Framework 39 to the Northeast Multispecies FMP with an Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis.
- Northeast Fishery Science Center. 2009. Analysis of Shoreside Impacts of Permit Stacking. Scallop Committee & Council Meeting Materials. September 1-2, 2009 Scallop Oversight Discussion Documents.
- Northeast Fishery Science Center. 2007. 45th SAW Assessment Report. Northeast Fisheries Science Center Reference Document 07-16.

Northeast Fishery Science Center. 2004. 39th Northeast Regional Stock Assessment Workshop (39th SAW) Assessment Summary Report. Northeast Fisheries Science Center Reference Document 04-10a.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration. (2008) Atlantic Sea Scallop Fishery; Framework Adjustment 19 Final Rule. Vol. 73, No. 104 / Thursday, May 29, 2008. P. 30790-30811.

