Framework Adjustment 50 to the
Northeast Multispecies FMP

Appendix V

NMFS Analysis and Discussion of FY 2013 to 2013 Unused Sector ACE Carryover
and
Proposed FY 2014 and beyond Carryover Program Clarification under Section 305(d) of the Magnuson-Stevens Conservation and Management Act

1.0 Introduction

The purposes of this appendix to the Framework Adjustment 50 Environmental Assessment (EA) are twofold: It is designed to provide NMFS-conducted analysis to support the NMFS preferred alternative to allow issuance of fishing year (FY) 2012 to FY 2013 unused sector ACE carryover. The analysis was conducted by staff from the NMFS Northeast Regional Office Sustainable Fisheries Division with support from the Northeast Fisheries Science Center. The discussion supplements the discussion already contained in the Council analysis of carryover impacts contained in the EA. Second, it outlines a section 305(d) Magnuson-Stevens Act carryover program clarification for use in FY 2014 and beyond.

2.0 FY 2012 to FY 2013 unused sector ACE

2.0.1 Background. Currently, the Northeast Multispecies Fishery Management Plan (FMP) authorizes up to 10 percent of unused sector Annual Catch Entitlements (ACE) for all stocks except GB yellowtail flounder[1] to be brought forward for use in the following fishing year. Termed 'carryover,' this provision was developed, approved, and implemented in Amendment 16 to the FMP. The provision did not specify how carried over catch should be accounted for under the annual catch limit (ACL) system concurrently implemented by Amendment 16.

In the two fishing years since the implementation of Amendment 16, NMFS has allowed up to the full 10 percent carryover of unused sector ACE, consistent with the FMP measures. To date, NMFS has accounted for carryover by first attributing catch in the next fishing year against any available carryover without deducting it from the sector sub-ACL for the next year. After the amount carried over has been fully exhausted, the sector's remaining catch for the year has been attributed to and deducted from the sector sub-ACL.

NMFS expected this accounting method could be used in a manner consistent with the overall intent of stock-level catch limits such that the risk of overfishing was minimal. To date, this accounting process has not caused any fishery level ACLs to be exceeded, even though the total potential catch (i.e., available ACLs + carryover) was higher than the fishery level ACL. There are multiple reasons for this: First, sectors have deliberately under harvested ACE to ensure carryover would be available in the subsequent fishing year. The ability to fully harvest all available stocks to the maximum amount allocated may be constrained. There are numerous possible explanations for why this may occur, including stock abundance, low catch rates, low ACE availability, market conditions and/or the ability to target the a specified stock. Other components within the fishery, such as the state waters sub-component or recreational fishery, have not fully harvested their respective sub-ACLs. This has been true even though the catch limits for some stocks have been reduced from one year to the next during the FY 2010 to FY 2012 timeframe.

[1] Any unused ACE allocated for Eastern GB cod or haddock stocks contributes to the 10-percent carry-over allowance for each but does not increase the allocation of Eastern cod or haddock during the following year.

NMFS now believes that a carryover from one fishing year to another must be fully accounted for in the second year ACLs to be consistent with the catch limit requirements established by the reauthorized Magnusson-Stevens Act and National Standard 1 (NS1) guidelines. The current carryover accounting practice of the Northeast region may be inconsistent with this conclusion to the extent it results in an ACL in one year to be exceeded due to additional carried over catch from the preceding year. It also would be inconsistent with conservation objectives of Amendment 16. On the other hand, to eliminate the carryover provision because of these concerns would potentially conflict with National Standard 10 provision of promoting safety at sea. As a result, there is a fundamental conflict between the conservation and management objectives of Amendment 16 between the need to ensure adherence to the catch limits for conservation purposes and the need to promote sector operational flexibility and safety at sea.

Carryover has been discussed and analyzed frequently since Amendment 16 was implemented in 2010 (75 FR 18262; April 9, 2010):

- As an outgrowth of an October 2011 sector workshop, the Council requested that NMFS analyze if more than 10 percent of ACE could be carried over from year-to-year. The Northeast Fisheries Science Center (NEFSC) conducted an analysis in November 2011 indicating that under harvest in year 1 would have some realized stock growth in year 2 that could permit some amount of carryover such that overfishing would not occur in year 2. This analysis was sent to the Council in late December 2012 with a request for the Council's Scientific and Statistical Committee (SSC) to provide advice on potential carryover increases above the existing 10 percent.
- The Council sent a January 20, 2012, letter to NMFS asking several clarifying questions pertaining to both the NEFSC analysis and carryover in general.
- NMFS responded on May 25, 2012. In this response, NMFS requested the Council review the existing carryover program to ensure consistency with the FMP objectives and the National Standard 1 guidelines. NMFS also explained the catch accounting process being used with respect to carryover. This process was previously outlined in this section.
- Carryover was discussed at the May 2012 Groundfish Committee meeting. The discussion followed many of the points raised in the May 25, 2012, letter to the Council.
- During the June 2012 Council meeting, a motion was passed requesting NMFS analyze the possibility of increasing the FY 2012 to FY 2013 GOM cod carryover from 10 to 50 percent. NMFS responded via letter on July 26, 2012. In this letter, NMFS relayed that a 50-percent under harvest in FY 2013 would not result in a 1-to-1 increase in FY 2013. The letter also relayed that carryover could not allow catch that would exceed annual catch limits or mortality targets that would result in overfishing.
- In the interim between these discussions, analyses, and letters, carryover continued to be discussed internally by NMFS and with the Council's Groundfish Plan Development Team.
- NMFS announced on February 14, 2013, the intent to propose the carryover amounts outlined here.
- On March 1, 2013, NMFS sent additional background and rationale in support of its preliminary determination to provide carryover amounts outlined here. This letter reiterated the need to revisit and revise the carryover program, specifying that such work must be completed and available for the FY 2014 fishing year that begins May 1, 2014.

The catch limits proposed for FY 2013 are substantial reductions for many stocks and present a complication with the existing carryover regulations. If 10 percent is carried over and is fully harvested in FY 2013 and the available ACLs are similarly fully harvested, the total catch (ACLs + carryover) will not only exceed the Council and NMFS recommended ACLs, but also the Acceptable Biological Catch (ABC) levels. For Gulf of Maine cod, the total potential catch would exceed the Overfishing Limit (OFL). NMFS now believes that a carryover from one fishing year to another must be accounted for in the second year ACLs to be consistent with the catch limit requirements established by the reauthorized Magnusson-Stevens Act and National Standard 1 (NS1) guidelines. Amendment 16 did acknowledge the potential for carryover to either increase the risk of or cause overfishing in a given year, particularly in the event that year-to-year catch limits declined steeply and available allocations and carryover were fully harvested (Amendment 16 FEIS, pp. 505-6).

Despite the extensive dialog on carryover, the Council did not develop modifications to the carryover program to be part of either Framework 48 or 50 action for May 1, 2013 implementation. There are two issues requiring resolution with respect to the current carryover program: An approach for addressing the carryover associated with the relatively high FY 2012 catch limits to the proposed lower FY 2013 limits that prevent overfishing and a long-term revision of the carryover program for consistency with the intent of Amendment 16 and the Magnuson-Stevens Act.

NMFS is proposing a 1-year transition period from FY 2012 to FY 2013 wherein carryover is permitted up to 10 percent of FY 2012 ACE for all stocks except Gulf of Maine cod. Carryover of Gulf of Maine cod is being proposed up to 1.85 percent of the FY 2012 sector ACE. NMFS proposes to use Magnuson-Stevens Act emergency rulemaking authority under section 305(c) of the act to reduce the amount of available GOM cod carryover from up to 10 percent to up to 1.85 percent. The catch accounting for this carryover would be handled as it has been in the past 2 years: Available carryover will be deducted first, and then remaining catch will be counted against the sector sub-ACL. The actual ACLs would not be modified or increased. This appendix will provide analysis and rationale to support these maximum carryover amounts and monitoring methodology with the intent of ensuring a low risk of causing overfishing should carryover be harvested in FY 2013.

2.1 FY 2012 to FY 2013 Carryover Analysis and Discussion

2.1.1 Introduction. NMFS proposes to continue allowing sectors to carry over up to 10 percent of unused FY 2012 ACE for all stocks except GOM cod. This is the status quo under the existing implementing regulations for the FMP for all carryover eligible stocks except GOM cod. NMFS proposes to use emergency authority provided to the Secretary of Commerce under section 305(c) of the Magnuson-Stevens Act to reduce the maximum carryover allowance for GOM cod so that overfishing is prevented in FY 2013. NMFS proposes to allow GOM cod to be carried over up to 1.85 percent of the FY 2012 ACE.

These carryover amounts are intended to be a 1-year transition, for the reasons that follow, while a more comprehensive long-term solution for carryover is developed. Section 3.0 of this appendix outlines NMFS' proposed carryover program clarification for FY 2014 and beyond. For FY 2013, carryover will only available for unused ACE, meaning that a sector must have under harvested available ACE in FY 2012 to be eligible to receive carryover in FY 2013.

NMFS views the primary purpose of as a way for fishermen to optimize their year-long fishing strategy which, in turn, helps fishermen operate in a safe and efficient manner. By allowing carryover, fishermen are less likely to feel forced to catch every allocated pound before the end of the fishing year, regardless of weather.

NMFS considered that an announcement to substantially reduce or eliminate carryover very late in FY 2012 could have the undesirable consequence of incentivizing a race to fish for the remainder of the year, as fishermen attempt to fully utilize available FY 2012 catch limits. Fishermen have been understandably relying on 10 percent carryover from the beginning of the 2012 fishing year. In light of these issues, NMFS is proposing to allow carryovers as previously outlined, consistent with the mandate to prevent overfishing and our past practices. This intended action would strike a balance in preserving the purpose of carryover while still ensuring that overfishing does not occur.

2.1.2 Analysis. NMFS evaluated the likelihood that stocks could be subject to overfishing if carryover was provided and fully harvested in conjunction with full utilization of all available FY 2013 catch limits. Hereafter, this is referred to as the 'total potential catch', i.e., harvest of the full fishery-level ACL and all available carryover provided.

NMFS first evaluated the offset between the proposed ACLs and their corresponding OFL. These values can be seen in Table 1, below. Next, the potential FY 2012 to FY 2013 carryover was added to the proposed ACLs (total potential catch) and the resulting value once again evaluated relative to the corresponding OFL (Table 1). It is important to note that the actual carryover values are calculated from the distributed ACE after removal of state permit banks from the total ACE. For example the FY 2012 GOM cod sector sub-ACL implemented through interim action is 3,618 mt. Within this, state permit banks were provided 83.4 mt so the 10 percent available for carryover is calculated from the 3,534.6 mt that were distributed as ACE to non-permit bank sectors. The distinction is important as it changes the potential 10 percent carryover from 361.8 mt to 353.5 mt, an 8.3 mt decrease.

Table 1. Potential unadjusted FY 2012 to FY 2013 carryover, proposed FY 2013 ACLs, OFLs, and comparison of total potential catch as a percent of OFL

	All weights are in metric tons (mt)						
Stock/Species	Maximum FY 2013 carryover if no action is taken (10% of FY 2012 sector sub-ACL)	Proposed FY 2013 Sector sub-ACLs	Proposed Total FY 2013 ACLs	FY 2013 OFLs	Proposed 2013 Total ACL as a Percent of the OFL	Total Potential Catch (carryover + ACL)	Total Potential catch as a percent of OFL
Georges Bank Cod	452	1,807	1,907	3,279	58.2%	2,359	71.9%
Georges Bank Haddock	2,735	26,196	27,936	46,185	60.5%	30,671	66.4%
Gulf of Maine Cod	354	830	1,470	1,635	89.9%	1,824	111.5%
Gulf of Maine Haddock	64	186	274	371	73.9%	338	91.1%
Southern New England Yellowtail Flounder	61	480	666	1,021	65.2%	727	71.2%
Cape Cod/Gulf of Maine Yellowtail Flounder	102	467	523	713	73.4%	625	87.7%
American Plaice	318	1,396	1,482	2,035	72.8%	1,800	88.5%
Witch Flounder	142	601	751	1,196	62.8%	893	74.7%
Georges Bank Winter Flounder	337	3,436	3,568	4,819	74.0%	3,905	81.0%
Gulf of Maine Winter Flounder	69	690	1,040	1,458	71.3%	1,109	76.1%
Acadian Redfish	822	10,091	10,462	15,468	67.6%	11,284	73.0%
White Hake	320	3,818	3,914	5,462	72.8%	4,294	78.6%
Pollock	1,230	12,810	14,921	20,060	74.4%	16,151	80.5%

This evaluation showed that for many stocks, total potential catch would be 81 percent or less of the OFL. Despite the potential to exceed the Council-recommended ACLs and SSC-recommended ABCs, NMFS believes there is a very low likelihood that overfishing could occur for these stocks if the total potential catch is realized in FY 2013. These stocks are Georges Bank cod and haddock, Southern New England Yellowtail Flounder, witch flounder, Georges Bank and Gulf of Maine winter flounder, Acadian redfish, white hake, and pollock.

For other stocks, Gulf of Maine haddock, Cape Cod/Gulf of Maine Yellowtail flounder, and American plaice, total potential catch ranged between 81 and 91 percent of the OFL. These stocks may present a higher risk that catch could approach OFL; however, for the reasons outlined in section 2.2.1 of this appendix, NMFS believes that the potential total catch is unlikely to be fully attained. This provides further mitigation against approaching the OFL for these stocks. The total potential catch available for GOM cod exceed would the OFL by 12 percent.

For this reason, the amount of carryover for GOM cod was necessary to reduce so that the risk of overfishing the stock was lowered.

2.1.3 Gulf of Maine cod. For GOM cod, NMFS considered what the FY 2012 catch limit would have been if interim measures to reduce, but not end, overfishing had not been put in place for the year. While this value would differ from what was actually provided as a FY 2012 catch limit, NMFS believes the approach has merit as it is reflective of what catch would have satisfied the requirement to immediately end overfishing in FY 2012. This value provides a factually based number that can be considered for the carryover transition year approach being proposed.

To calculate this value, NMFS relied on the GOM cod stock assessment projection resulting from the December 2012 peer reviewed stock assessment. Some may argue that it would be more appropriate to use the 2011 stock assessment, in part, because the information in the 2012 assessment was not yet known when the catch level was established for FY 2012. NMFS asserts that the 2012 assessment represents the best available scientific information consistent with National Standard 2. Several changes occurred between the 2011 and 2012 assessments, moreover, stock projections to examine fishing mortality and stock sizes in FY 2013 and beyond are conducted with the 2012 assessment methodology. If the 2011 assessment framework were used as the basis to derive this "what if" scenario for FY 2012, the results would not be directly comparable to the projections conducted using the 2012 assessment.

To derive an estimate of what the FY 2012 ABC would have been had interim measures not been used, NMFS applied the ABC control rule employed by the Council in setting catch limits to the 2012 benchmark assessment. The Council control rule currently used to establish ABCs is based on harvesting at 75 percent of the $F_{msy\text{-}proxy}$. Catch projections were conducted based on the 2012 assessment using an assumed harvest at 75% of the $F_{MSY\text{-}proxy}$ (0.135) in 2012. Under these projections the corresponding ABC for FY 2012 would have been 1,249 mt. From this ABC, sectors would have received a sub-ACL of 656 mt, 10 percent of which is 65.6 mt. This value was adjusted slightly to by removing sector permit banks from the ACE calculation as they are ineligible to receive carry over. After this adjustment, the actual carryover value becomes 65.39 mt. When applied to the actual FY 2012 GOM cod sector sub-ACL implemented through interim measures, the 65.39 mt would be 1.85 percent of the catch limit. This is the amount NMFS proposes to provide to sectors as GOM cod carryover for FY 2013. This amount of carryover, when considered as total potential catch for FY 2013 is 94 percent of the OFL, as outlined in the following table.

Table 2. NMFS revised GOM cod carryover information.

Stock/ Species	*Revised* Maximum FY 2013 carryover	Proposed FY 2013 Sector sub-ACL	Proposed Total FY 2013 ACL	FY 2013 OFL	Proposed 2013 Total ACL as a Percent of the OFL	Total Potential Catch (carryover + ACL)	Total Potential catch as a percent of OFL
Gulf of Maine Cod	65	830	1,470	1,635	89.9%	1,535	93.9%

2.2 Discussion

2.2.1 Mitigating Considerations. It is important to consider that the total potential catch represents the 'worst case scenario' that may not be realized for several reasons. The examination of total potential catch makes use of the maximum carryover amount possible, i.e., 10 percent for all stocks except GOM cod and 1.85 percent for that stock. Information from the FY 2011 and FY 2012 carry over shows that the full 10 percent is not always brought forward. While the majority of stocks have brought forward 7 to 10 percent, there have been a few situations where slightly less than 5 percent was carried over. It will not be known exactly how much of the potential FY 2012 carryover is brought forward until final catch accounting for the fishing year is complete. This evaluation is typically completed by the end of June. If less than the maximum carryover is brought forward, there will be a greater offset from the applicable OFL. For example, if 80 mt is carried over instead of 102 mt for Cape Cod/GOM yellowtail flounder, the total potential catch becomes 84 percent of the OFL. This is roughly a 3 percent change from the maximum carryover level. This is a likely scenario for this stock based on NMFS catch reports through April 19, 2013.

It is also uncertain how much of the total potential catch will be taken in FY 2013. Certainly, both cod stocks are commercially very important species and the expectation is that the available total potential catch will be as fully used as possible. The Quota Change Model (QCM) used to both project utilization of available quota and the resulting ex-vessel revenue may be helpful in better understanding the total potential catch utilization for FY 2013. The methods and model description can be found in Section 7.4.2.2.2 of this EA.

Table 3. QCM projected FY 2013 utilization, resulting catch, and comparison to OFLs based on preferred catch limit alternatives.

Stock/Species	Total Potential Catch (carryover + ACL)	Total Potential catch as a percent of OFL	QCM Projected Utilization	Resulting total QCM projected catch (mt)	QCM Projected catch as a percent of OFL
Georges Bank Cod **	2,359	71.9%	85.0%	2,005	61.2%
Georges Bank Haddock **	30,671	66.4%	15.0%	4,601	10.0%
Gulf of Maine Cod	1,535	93.9%	99.0%	1,520	92.9%
Gulf of Maine Haddock	338	91.1%	89.0%	301	81.1%
Southern New England Yellowtail Flounder	727	71.2%	88.0%	639	62.6%
Cape Cod/Gulf of Maine Yellowtail Flounder	625	87.7%	74.0%	463	64.9%
American Plaice	1,800	88.5%	78.0%	1,404	69.0%
Witch Flounder	893	74.7%	93.0%	830	69.4%
Georges Bank Winter Flounder	3,905	81.0%	46.0%	1,796	37.3%
Gulf of Maine Winter Flounder	1,109	76.1%	16.0%	177	12.2%
Acadian Redfish	11,284	73.0%	31.0%	3,498	22.6%
White Hake	3,782	71.3%	70.0%	2,647	49.9%
Pollock	16,151	80.5%	51.0%	8,237	41.1%

** combined total of Eastern and Western Georges Bank, including Canadian TAC, aggregate against the total stock OFL.

This information indicates the stocks with the highest likelihood of high levels of potential total catch utilization are both cod stocks, GOM haddock, Southern New England yellowtail flounder and witch flounder. In as much as the QCM can accurately predict utilization, all other stocks FY 2013 catch is projected to be very low percentages of the OFL. Thus, NMFS concludes the risk of overfishing on these stocks is quite low. NMFS maintains that the higher utilization stocks still maintain an effective buffer from the OFL, which should be sufficient to ensure overfishing does not occur.

Table 4 provides information on the utilization of available sector and fishery ACLs for FYs 2010 and 2011. This information may not be predictive of FY 2012 or 2013 utilization for several reasons: Sectors have intentionally under harvested most stocks up to 10 percent to provide subsequent year carryover; the availability of some stocks may have constrained efforts to more fully utilize other stocks; catch limits may have been set optimistically high such that finding sufficient numbers of fish to more fully attain allocations was challenging; and lastly, the FY 2013 fishery will be unlike any previous fishery given the significant reductions in catch limits and condition of the stocks. It is not known how fishing practices may change for the

remainder of FY 2012 or how they may differ in FY 2013. The value of the information in Table 4 re-iterates that FY 2012 ACLs may not be fully utilized, nor will all FY 2013 ACLs be fully attained.

Table 4. Percent utilization of available catch limits, by fishing year, 2010-2011. Data listed highest to lowest utilization based on 2-year average total groundfish ACL utilization.

	2010			2011			2-Year Weighted Average		
	Total Groundfish ACL	Commercial Groundfish sub-ACL	Sector sub-ACL	Total Groundfish ACL	Commercial Groundfish sub-ACL	Sector sub-ACL	Total Groundfish ACL	Commercial Groundfish sub-ACL	Sector sub-ACL
White Hake	86.9	88.4	88.4	88.9	93.5	93.9	87.9	91.0	91.2
Witch Flounder	92.6	85.1	84.1	84.8	74.1	75.3	88.7	79.6	79.7
GB Winter Flounder	78.3	75.1	75.8	85.1	86.9	87.4	81.7	81.0	81.6
CC/GOM Yellowtail Flounder	81.7	76.6	76.8	78.9	78.3	79.4	80.3	77.4	78.1
GB cod	83.7	82.5	83.2	68.0	68.8	68.9	75.8	75.6	76.0
SNE Yellowtail Flounder	67.0	55.4	64.9	76.7	67.3	84.3	71.8	61.4	74.6
GOM cod	71.0	75.9	83.6	69.2	74.1	83.4	70.1	75.0	83.5
GOM Haddock	65.5	67.4	46.4	57.7	59.4	52.6	61.6	63.4	49.5
GOM Winter Flounder	83.8	67.2	60.7	52.4	45.0	46.5	68.1	56.1	53.6
Plaice	53.5	53.9	54.7	42.6	43.8	44.7	48.1	48.9	49.7
Pollock	39.8	33.8	33.7	46.1	43.0	42.8	42.9	38.4	38.2
Redfish	30.0	31.4	31.7	25.7	26.9	27.0	27.8	29.2	29.4
GB Haddock	20.0	20.6	20.5	13.0	12.6	12.6	16.5	16.6	16.6

Fish that are not harvested one year can, under specific circumstances, increase stock size in subsequent years due to benefits from additional spawning opportunities and somatic growth. However, this increased stock size will not normally result in a one-for-one increase in the ABC. In scenarios where a stock is substantially under harvested, the increase may well be sufficient to cover carryover issuance, if the exercise were undertaken to adjust ABC in FY 2012. GOM cod does not meet this criterion in FY 2012. To better illustrate this potential stock benefit of under harvest in FY 2012, NMFS conducted stock projections using GOM cod as the example species. While GOM cod is, in some ways, a problematic example because the FY 2012 measures were established through emergency action an allowed continued overfishing, albeit reduced. Further, available catch reporting information indicates that the FY 2012 catch will likely be substantially below the total ACL of 6,700 mt. However, as GOM cod is the stock for which the FY 2013 potential total catch is highest in relation to the overfishing limit, further examination of hypothetical examples provide some insight into the potential catch changes available for allocation in year t+1 resulting from under harvest of the year t ACL.

Three FY 2012 hypothetical catch assumption scenarios were examined:

1. Catch would be similar to the utilization 2-year average from Table 2. Thus, 73 percent of the FY 2012 total ACL of 6,700 mt would be taken resulting in total catch of 4,891 mt.
2. The entire available FY 2012 ACL of 6,700 mt except for 10 percent withheld by sectors would be taken. This scenario results in a total assumed FY 2012 catch of 6,030 mt.

3. The entire available FY 2012 ACL of 6,700 mt except for the 65 mt being provided as carryover in FY 2013 would be taken. This scenario results in a total assumed FY 2012 catch of 6,617 mt.

These under harvest scenarios result in the following potential changes to the catch advice for FY 2013. The assessment outputs for these analyses can be found later in this appendix. The increases are the amount the ABC could be increased in comparison to a 901 mt ABC from the base case model derived from an assumed FY 2012 catch of 6,700 mt (i.e., fully attained ACL). Scenario:

1. Base case: 6,700 mt caught in FY 2012, FY 2013 ABC derived from the 75 percent F_{msy} ABC control rule
2. The ABC (derived from the 75 percent F_{msy} ABC control rule) could be increased 213 mt.
3. The ABC could be increased 78 mt.
4. The ABC could be increased 9 mt.

While it is unrealistic to expect that the stock assessment projections can be re-run for all multispecies stocks to ascertain the potential changes in catch advice for FY 2013, these examples do provide some context for the potential changes that would result from such an exercise. It is noteworthy that through late March, approximately 57 percent of the FY 2012 sector and common pool GOM cod allocation has been taken. If harvest remains low, even exceeding the 73 percent utilization scenario from above, the FY 2012 under harvest would provide for a potential ABC increase in FY 2013 to sufficiently cover the provided carryover. If the ABC were increased based on this type of analysis, the additional 213 mt would increase the ABC to 1,763 mt (213 + 1,550 mt). The resulting ACL from this ABC would be 1,672 mt which is 137 mt higher than the maximum potential catch of 1,535 mt.

2.2.2 Conclusion regarding FY 2012 to FY 2013 carryover. The total potential catch with the proposed approach to carryover for FY 2013 ensures maximum catch will remain below established overfishing limits. This approach maintains some amount of uncertainty buffers to ensure that the overfishing limits are not exceeded. Furthermore, there is strong supporting information that indicates that overfishing is unlikely to occur, in summary:

- The amount of carryover available from FY 2012 to FY 2013 may be less than the maximum permitted (10 percent for all stocks except GOM cod which is 1.85 percent). Stocks for which carryover is less than the maximum provide additional buffering of total potential catch from OFLs.
- The available FY 2012 ACLs are unlikely to be fully utilized providing stock growth for FY 2013 that, if quantified through stock assessment updates, would indicate potential surplus catch that could be used to adjust the FY 2013 ABC/ACLs that maybe sufficient to fully cover the carryover amounts.
- The actual use of total available catch in FY 2013 is likely to be well below the maximum potential level for many stocks. For those that may fully harvest the total potential catch limit levels, the total catch would remain well below OFLs. In addition, if a full analysis of actual FY 2012 were conducted and FY 2013 ABC/ACL values updated, sufficient stock growth would occur from FY 2012 under harvest to ensure total potential catch would be less than the potential revised ACL values.

Based on this, NMFS believes that allowing these carryover amounts on a narrowly defined 1-year basis is not likely to result in any significant harm to these stocks or, where applicable, their rebuilding strategies. NMFS intends to use the same catch accounting method in place for previous fishing years. Carried over unused ACE will be deducted first from FY 2013 sector catch but will not be counted toward the FY 2013 sector sub-ACL. Once all available carried over catch, all remaining sector catch will be counted against the sector sub-ACL.
NMFS is aware that stock assessment retrospective evaluation of catch advice for some multispecies stocks has been overly optimistic. Fishing mortality has sometimes been higher than previously believed and population size and/or recruitment lower than expected. These issues have arisen in years when catch has remained within established limits. There is the potential risk that this scenario could be realized in retrospective evaluation of either FY 2012 or FY 2013 or both. Such information could change stock perception and allowing carryover could exacerbate the problem. NMFS has evaluated and accepted this risk, in large part, because the total potential catch for all stocks maintains a higher than 50 percent probability of preventing overfishing and the multiple mitigating considerations outlined further decrease the risk of overfishing in FY 2013.

As previously stated, the approach for FY 2013 represents a 1-time approach designed to ensure overfishing does not occur while providing a meaningful transition to a redesigned carryover program. NMFS acknowledges not only the safety-at-sea value of carryover, but also the economic benefit for the upcoming fishing year.

3.0 Proposed Carryover Program for FY 2014 and Beyond

3.0.1 Introduction. As has been stated on numerous occasions, the existing New England Multispecies carryover program, current transitional year notwithstanding, is not consistent with the intent of annual catch limit based management prescribed in National Standard 1 guidelines. NMFS has previously advised that carryover should not cause ACLs to be exceeded or to otherwise cause overfishing. NMFS has provided some guidance in past correspondence regarding more appropriate approaches for carryover. There are limited options for a functional carryover program that is consistent with ACL-based management. NMFS believes that there are two potential overarching options for carryover approaches: A *de minimus* approach that provides nominal carryover designed solely for end-of-year safety at sea considerations or a larger scale program designed to provide relatively large year-to-year carryover for safety, operational efficiency, and market optimization.

3.0.2 NMFS Recommended Approach for FY 2014 and Beyond. NMFS believes the concept of unused ACE carryover has merit, primarily to address at-sea safety concerns. In the following section, NMFS proposes the conceptual framework for a *de minimus* approach to carryover and provides some additional information to consider in the development of larger scale carryover programs. NMFS is recommending a *de minimus* approach as a clarification under section 305(d) of the Magnuson-Stevens Act for 2014 and beyond, as outlined below. The clarification component is that while the current program provides for <u>up to</u> [emphasis added] 10 percent carryover of unused ACE, NMFS will only provide a nominal carryover amount to

ensure consistency with the FMP and the intent of catch limit requirements of the Magnuson-Stevens Act. It may be possible, through future analysis, to justify and provide a larger amount of carryover up to 10 percent of the prior year ACE.

3.0.3 Carryover program clarification discussion. Although NMFS believes the current accounting practice for carryovers for FY 2013 can be justified, such practice is not appropriate for FY 2014 and thereafter because there is sufficient time to alert the fishing industry of how NMFS intends to carry out the accounting for carryovers moving forward in a way that is consistent, to the extent practicable, with Magnuson-Stevens Act national standards and other provisions. This is necessary to reconcile the fundamental conflict between ensuring long-term compliance with catch limits and the need to provide at some level the safety and management benefits of carryovers. Because the Council did not specify how to account for carryovers in light of this conflict in Amendment 16 nor in proposed Frameworks 48 and 50, NMFS has determined it has the responsibility under Section 305(d) to propose regulations that ensure that the measures of Amendment 16 and Frameworks 48 and 50 can be carried out in a manner consistent with the provisions of the Magnuson-Stevens Act. NMFS has concluded it has the authority to propose such regulations because they are consistent with the authority provided the Secretary of Commerce in Section 305(d) of the Magnuson-Stevens Act. This section makes clear that the Secretary has the authority and responsibility to implement regulations to carry out existing fishery management plan provisions to ensure their function in accordance with the Act. In this case, such an approach is justified by this unusual circumstance where previously approved Council-recommended measures must now be reconciled in order to be carried out consistently with the Magnuson-Stevens Act and the National Standard guidelines NMFS proposes a two-part system to clarify carryover operations in FY 2014 and beyond. This proposed approach would provide at least a nominal (*de minimus*) amount of carryover with the potential to provide up to the full 10 percent without triggering reactive pound-for-pound accountability measure overage paybacks, dependent on the final total fishery catch relative to the total fishery ACL. The carryover accounting process used by NMFS in this proposed system is the fundamental clarification, as explained in the following paragraphs. Carryover would continue to be available only when sectors under harvest available ACE in the prior year by an amount sufficient to provide the carryover level in question. This would apply to both *de minimus* and other carryover.

First, NMFS proposes to provide an automatic *de minimus* amount of carryover. This will ensure some level of carryover that industry can count on and factor into their decision making late in the fishing year. NMFS has not yet determined what an appropriate *de minimus* amount would be. Examples may include an amount sufficient to cover an average trip's landing for the stock in question. The rationale being that if a single trip is not made late in the fishing year because of safety concerns or market conditions, the foregone catch from that trip could be carried forward. Other options include a small percentage of the following year ACE for the stock in question (e.g., 1 percent of the stock's FY 2014 ACE). This would better ensure that available *de minimus* carryover was consistent with the prevailing stock conditions and catch advice for the year in which carryover would be harvested.

The expectation is that the *de minimus* amount of carryover provided may be justified for multiple reasons. The amount provided, if taken, would not be expected to cause fishery-level ACLs to be exceeded. The analysis conducted for FY 2012 to FY 2013 carryover has illustrated

that the fishery has not operated in a manner that fully utilizes available allocations. Even with the 10 percent routinely set aside from the sector sub-ACL to provide carryover, few stocks have utilized greater than 85 percent of the available stock level ACL. As previously stated, NMFS is continuing to develop *de minimus* carryover analyses and will provide completed results to the Council's Groundfish Plan Development Team and Groundfish Committee for their review and input. It is not expected that the *de minimus* carryover amount would be re-evaluated annually; however, if the ongoing analysis indicates this would be a critical component to ensure ACLs were not likely to be exceeded, then annual review could be contemplated.

Second, NMFS would allow sectors to continue fishing beyond their initially allocated ACE up to the full carryover amount for which they are eligible based on their prior year under harvest. The maximum amount would remain 10 percent, inclusive of the automatic *de minimus* carryover. At the end of the fishing year or as soon as possible thereafter, NMFS would evaluate the total fishery catch relative to the total ACL. The amount of carryover counted against the sector ACE would depend on if the total catch is above or below the ACL. Here are the proposed accounting procedures NMFS would use:

- If the total ACL for the year is not exceeded, any carryover used would not be counted against a sector's ACE. No reactive AM would be required. Essentially, because the total ACL was not exceeded, most likely because some sectors or other fishery components did not fully utilize their respective allocations for the year, there is no consequence associated with the use of carryover. This would result in accounting that is similar to the current carryover accounting practice wherein carryover use is not directly attributed to sector ACE.
- If the total ACL for the year <u>has</u> been exceeded and carryover was used, NMFS would only count the amount of carryover used above the total ACL against sector ACE. Individual sectors involved with the ACL overage as a result of carryover use would be subject to pound-for-pound overage repayment specified by the FMP accountability measures. It is possible that some portion of carryover use may not be attributed to sector ACE, even if the ACL is exceeded. If other fishery components contribute to the ACL overage, sectors would only be charged for the carryover ACE used.
- In the event that a situation similar to FY 2013 occurs wherein substantial catch reductions are required, NMFS would consult with the Council about modifying the allowable carryover amount in excess of the *de minimus* level so that the total potential catch did not exceed the OFL. For FY 2013, NMFS is making such a modification using section 305(c) authority in large part due to the timing considerations and lack of adequate public notice and comment; however, in future similar situations NMFS would rely on 305(d) authority and Council recommendations to effect such changes. The rationale for so doing would be clarifying the carryover amount(s) to be consistent in a given year with the annual catch limit requirements of the Magnuson-Stevens Act.

NMFS believes this proposed approach maintains the original intent of the carryover program established by Amendment 16 and improves the consistency of the program with the intent of the annual catch limit requirements of the Magnuson-Stevens Act and NS 1 guidelines. Under this proposed clarification, sectors could continue to fish beyond their initially allocated ACE, up to

the amount of their eligible carryover (up to 10 percent); however, there is some risk involved with using carryover. If the fishery level ACL is exceeded, individual sectors that made use of carryover would face an accountability measure. This system would set a total potential catch above the fishery-level ACL; however, the insurance that accountability for any ACL overage that would result due to use of carryover use is sufficient to justify this approach.

NMFS recognizes that this proposed clarification is a substantial change to the existing carryover program. However, NMFS has been clear that beyond FY 2013, the existing carryover program requires revision to operate consistent with the Magnuson-Stevens Act, the FMP, and NS 1 guidelines. NMFS acknowledges that this general description of the proposed accounting change does not explicitly discuss the implications of leasing ACE. Leasing, as well as other complexities of the accounting system have not yet been closely evaluated by NMFS or discussed with the Council and public. As a result, NMFS is soliciting public comment on the overall conceptual approach proposed. After considering comments received, NMFS may further clarify any remaining details, either in collaboration with the Council or independently, for FY 2014 implementation. The Council may also take action to revise the carryover program for FY 2014.

4.0 GOM Cod Assessment Outputs used in Carryover Analyses (Section 2.2)

Base Projection

```
AGEPRO VERSION 4.2

SAW55_3BLOCK_BASE

Date & Time of Run: 01 Mar 2013  11:57

Input File Name:
D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\GOMCOD_SAW55_3BLOCK_BASE_SHORT_75FMSY_12CAT6700.INP

First Age Class:                          1
Number of Age Classes:                    9
Number of Years in Projection:           19
Number of Fleets:                         1
Number of Recruitment Models:             1
Number of Bootstraps:                  1000
Number of Simulations:                   10

Bootstrap File Name:            D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\SAW55_3BLOCK_BASE_MCMC.BSN

Number of Feasible Solutions:      10000  of      10000 Realizations

Input Harvest Scenario

Year  Type         Value

2012  Landings       6700
2013  F-Mult       0.1350
2014  F-Mult       0.1350
2015  F-Mult       0.1350
2016  F-Mult       0.1350
2017  F-Mult       0.1350
2018  F-Mult       0.1350
2019  F-Mult       0.1350
2020  F-Mult       0.1350
2021  F-Mult       0.1350
2022  F-Mult       0.1350
2023  F-Mult       0.1350
2024  F-Mult       0.1350
```

2025	F-Mult	0.1350
2026	F-Mult	0.1350
2027	F-Mult	0.1350
2028	F-Mult	0.1350
2029	F-Mult	0.1350
2030	F-Mult	0.1350

Recruits 1000 Fish

Year Class	Average	StdDev
2012	6926.7937	4465.8077
2013	6923.5380	4386.4587
2014	6937.4571	4438.1684
2015	6919.2931	4527.0696
2016	6848.1821	4336.7865
2017	6927.8128	4327.1141
2018	6904.8750	4345.1040
2019	6853.8386	4341.3137
2020	6939.1845	4398.8850
2021	6952.5694	4402.3823
2022	6973.7562	4462.6114
2023	6932.3252	4365.9713
2024	7044.3441	4564.4314
2025	6897.3804	4358.1031
2026	6933.3608	4380.3428
2027	6924.7521	4452.7725
2028	7017.1113	4540.7667
2029	6852.1367	4397.8307
2030	6883.5775	4300.2626

Recruits Distribution

Year Class	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2013	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2014	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2015	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2016	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2017	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2018	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2019	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2020	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2021	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2022	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2023	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2024	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2025	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2026	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2027	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2028	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2029	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600

2030	1347.1080	2222.8420	3135.0670	3934.5510	5235.3460	9103.0150	11930.1300	14588.2800	23922.8900

Spawning Stock Biomass x 1000 MT

Year	Average	StdDev
2012	8.3421	2.3918
2013	7.2783	2.6810
2014	10.0500	2.8974
2015	14.8931	3.5798
2016	21.6058	5.3624
2017	28.6115	7.1669
2018	34.6725	8.3695
2019	39.8453	9.2322
2020	45.8045	9.9438
2021	51.8793	11.2043
2022	56.2174	11.7407
2023	59.3242	12.0087
2024	61.5622	12.1824
2025	63.1762	12.2105
2026	64.3926	12.2510
2027	65.2718	12.3115
2028	65.8909	12.4036
2029	66.3606	12.4648
2030	66.6867	12.5129

Spawning Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	3.1577	4.6894	5.3264	6.7168	8.1697	9.7514	11.4842	12.6049	14.6496
2013	2.0220	3.3134	3.9764	5.4013	6.9855	8.8429	10.7648	12.0274	14.5567
2014	4.3182	5.7556	6.5504	8.0248	9.7666	11.7369	13.8544	15.3133	17.9104
2015	7.9562	9.7198	10.6605	12.4135	14.4784	17.0082	19.5943	21.4709	25.1903
2016	12.2507	14.3536	15.5521	17.8707	20.8614	24.5051	28.5318	31.5311	38.3466
2017	16.4638	18.9882	20.5723	23.4685	27.5529	32.4312	38.0922	42.2869	50.0720
2018	20.4447	23.1957	25.1084	28.6617	33.4204	39.2037	46.1718	50.3541	59.2481
2019	23.7347	27.0746	29.1108	33.2551	38.5400	45.2349	52.3447	56.8784	66.7061
2020	28.0756	31.8883	34.1766	38.6707	44.4802	51.6589	59.1503	64.0874	74.5029
2021	31.7544	35.9814	38.7526	43.8574	50.4813	58.4978	66.9303	72.5104	83.6380
2022	34.4395	39.1381	42.2152	47.7970	54.9071	63.3100	71.7896	77.3716	89.1265
2023	36.8443	41.7503	44.9461	50.7437	58.0647	66.5819	75.1497	80.9850	92.6454
2024	38.2779	43.6589	47.0303	52.8656	60.4319	68.9056	77.7217	83.5149	95.8973
2025	39.8224	45.0879	48.3943	54.4421	62.0539	70.5079	79.4209	84.9696	96.7211
2026	40.8001	46.2817	49.5988	55.6769	63.3456	71.9574	80.7713	86.4580	97.3255
2027	41.7581	47.1878	50.3627	56.4071	64.0759	72.8733	81.9559	87.4281	98.3377
2028	42.3610	47.6628	51.0017	56.9348	64.6496	73.3928	82.5775	88.1448	99.2880
2029	43.1109	47.9654	51.2932	57.3363	65.1541	74.0516	83.1237	88.7875	100.4885
2030	43.2051	48.3273	51.6468	57.5700	65.4016	74.4031	83.5932	89.1376	100.3399

JAN-1 Stock Biomass x 1000 MT

Year	Average	StdDev
2012	12.8419	2.7428
2013	10.7059	3.2239
2014	15.4452	3.7906
2015	22.1547	5.2730
2016	30.1413	7.3359
2017	37.9599	9.1415
2018	44.5656	10.3001
2019	50.1871	11.0989
2020	56.6677	11.7588
2021	63.2691	13.0254
2022	67.9976	13.5786
2023	71.4015	13.8755
2024	73.8532	14.0701
2025	75.6215	14.0981
2026	76.9547	14.1426
2027	77.9002	14.2312
2028	78.5523	14.3388
2029	79.0632	14.3853
2030	79.4242	14.4249

JAN-1 Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	7.2801	8.7308	9.4238	10.9381	12.5757	14.4349	16.4055	17.7124	20.3350
2013	4.3167	5.9154	6.7933	8.4507	10.4136	12.5721	14.9009	16.5455	19.3998
2014	7.9906	9.8492	10.9069	12.7981	15.0611	17.7540	20.4987	22.3281	25.7647
2015	12.6862	14.8254	16.1119	18.4860	21.4778	25.0589	29.0393	31.8008	38.1984
2016	17.5282	20.2108	21.8605	24.9474	29.0992	34.0181	39.7382	44.0453	52.4592
2017	22.3783	25.4374	27.5360	31.4008	36.6994	42.8888	50.3326	55.2363	65.3209
2018	26.7326	30.3722	32.6248	37.1819	43.1202	50.4938	58.4965	63.6624	74.4957
2019	30.4507	34.6263	37.1978	42.2012	48.7452	56.7277	65.0894	70.4613	82.7322
2020	35.4717	39.9093	42.8344	48.2972	55.2291	63.6885	72.3081	78.3793	89.8595
2021	39.2103	44.5528	47.8026	53.9858	61.8046	71.0905	80.6526	87.2284	99.3462
2022	42.4073	48.1355	51.8015	58.2641	66.5914	76.2487	86.0296	92.2583	105.6663
2023	44.9716	50.9888	54.7950	61.5452	70.0199	79.8640	89.8622	96.1288	110.0289
2024	46.6588	53.0663	56.8685	63.8510	72.6298	82.3113	92.7014	98.8778	113.2429
2025	48.5350	54.6026	58.5287	65.5437	74.3109	84.2971	94.3116	101.0491	113.9889
2026	49.4107	56.0964	59.8183	66.8869	75.6943	85.7998	96.0246	102.2809	114.4358
2027	50.5622	56.9956	60.7051	67.7300	76.5713	86.7193	97.0317	103.4275	115.5463
2028	51.3623	57.2729	61.2143	68.3286	77.1148	87.3236	97.8675	104.1836	117.3493
2029	52.0187	57.7592	61.6717	68.6730	77.7351	87.9680	98.2806	104.8636	118.3263
2030	51.7720	58.1753	62.0276	68.9507	78.0863	88.4643	98.8185	105.1974	117.6996

Mean Biomass x 1000 MT

Year	Average	StdDev
2012	12.5945	3.4525
2013	14.0806	3.7122
2014	20.6332	4.8870
2015	29.1103	7.2371

2016	37.8213	9.5292
2017	45.5447	11.0778
2018	52.0941	12.0821
2019	57.7495	12.7725
2020	63.6419	13.2787
2021	69.2469	14.0712
2022	73.2649	14.4480
2023	76.1802	14.6742
2024	78.2957	14.8263
2025	79.8349	14.8682
2026	80.9779	14.9296
2027	81.7873	15.0362
2028	82.3326	15.1312
2029	82.7591	15.1450
2030	83.0638	15.1699

Mean Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	5.3472	7.3621	8.2813	10.2447	12.2708	14.6031	17.1045	18.6011	21.5994
2013	6.5964	8.5417	9.6127	11.4610	13.7470	16.3595	18.9828	20.7829	23.9681
2014	11.4945	13.7276	14.9679	17.2476	20.0223	23.3520	27.0224	29.5082	35.1108
2015	16.7504	19.5743	21.0265	24.0374	28.0396	32.8784	38.5116	42.7461	51.8844
2016	21.9243	25.0220	27.1167	30.9929	36.3929	42.8563	50.5072	56.0370	66.3301
2017	26.5062	30.3471	32.8301	37.5664	43.8858	51.6818	60.7041	66.2838	78.2716
2018	30.9529	35.3573	38.0269	43.4970	50.4802	59.1738	68.4468	74.3494	87.4273
2019	34.7988	39.7416	42.7356	48.5713	56.1281	65.3641	74.8872	81.2901	94.4343
2020	39.4493	44.5586	47.8923	54.1888	62.0292	71.6809	81.3386	88.2562	100.8303
2021	42.7909	48.7624	52.4802	59.2204	67.7184	77.8635	87.9312	94.8618	108.3001
2022	45.7838	52.0306	55.9824	62.9779	71.8852	82.0922	92.3559	98.9641	112.9644
2023	47.8982	54.4684	58.5215	65.7297	74.7703	84.9459	95.7880	102.2032	116.8936
2024	49.8519	56.3499	60.2856	67.6763	76.9498	87.3069	98.1454	104.8944	118.2968
2025	51.0317	57.7939	61.8122	69.2935	78.5477	89.0550	99.8048	106.4874	119.9917
2026	51.9708	59.1256	62.9043	70.3144	79.5542	90.2609	101.1171	107.6147	120.8693
2027	53.1917	59.6535	63.6296	71.0063	80.2255	90.9286	102.0755	108.7196	122.1849
2028	54.0221	60.0591	64.0219	71.4418	80.7996	91.6352	102.7972	109.7319	123.1467
2029	53.8982	60.4374	64.3871	71.8098	81.3703	92.2216	103.2039	109.8964	123.6715
2030	54.1130	60.8848	64.8232	72.0875	81.7340	92.4492	103.2939	110.1303	123.2661

Combined Catch Biomass x 1000 MT

Year	Average	StdDev
2012	6.7000	0.0000
2013	0.9327	0.3719
2014	1.2065	0.4018
2015	1.7456	0.4281
2016	2.6493	0.6621
2017	3.6378	0.9544
2018	4.5180	1.1456
2019	5.2853	1.2939
2020	6.0797	1.4050

2021	6.8364	1.5428
2022	7.3776	1.5988
2023	7.7614	1.6260
2024	8.0391	1.6434
2025	8.2417	1.6485
2026	8.3941	1.6571
2027	8.5040	1.6653
2028	8.5865	1.6753
2029	8.6459	1.6854
2030	8.6847	1.6920

Combined Catch Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000
2013	0.2032	0.3832	0.4661	0.6697	0.9005	1.1584	1.4200	1.5867	1.9403
2014	0.4187	0.6165	0.7121	0.9325	1.1625	1.4426	1.7295	1.9313	2.2885
2015	0.8824	1.1088	1.2312	1.4444	1.7083	2.0120	2.3102	2.5122	2.9034
2016	1.4880	1.7598	1.9103	2.1923	2.5538	3.0019	3.4952	3.8724	4.7465
2017	2.0617	2.3933	2.5761	2.9595	3.4881	4.1244	4.8762	5.4706	6.6486
2018	2.6117	2.9748	3.2222	3.6979	4.3475	5.1264	6.0720	6.6934	7.9483
2019	3.0662	3.5149	3.7888	4.3569	5.0954	6.0248	7.0401	7.6990	9.0493
2020	3.6227	4.1272	4.4462	5.0761	5.8895	6.8992	7.9935	8.6548	10.1863
2021	4.0738	4.6492	5.0382	5.7318	6.6270	7.7528	8.8895	9.6942	11.2503
2022	4.4476	5.0731	5.4791	6.2358	7.1939	8.3440	9.4937	10.2901	11.8195
2023	4.7292	5.4016	5.8253	6.5939	7.5816	8.7453	9.9120	10.6862	12.2907
2024	4.9362	5.6480	6.0831	6.8680	7.8648	9.0283	10.2100	11.0026	12.6174
2025	5.1165	5.8253	6.2480	7.0600	8.0946	9.2285	10.4395	11.1976	12.7581
2026	5.2504	5.9328	6.3973	7.2108	8.2338	9.4124	10.6190	11.3904	12.9313
2027	5.3826	6.0636	6.4990	7.3069	8.3378	9.5199	10.7466	11.5015	12.9659
2028	5.4432	6.1478	6.5973	7.3808	8.4083	9.6003	10.8426	11.6073	13.1440
2029	5.5132	6.1759	6.6250	7.4271	8.4792	9.6608	10.9304	11.6996	13.2368
2030	5.5401	6.2218	6.6485	7.4568	8.5078	9.7394	10.9712	11.7205	13.2948

Landings x 1000 MT

Year	Average	StdDev
2012	6.7000	0.0000
2013	0.9327	0.3719
2014	1.2065	0.4018
2015	1.7456	0.4281
2016	2.6493	0.6621
2017	3.6378	0.9544
2018	4.5180	1.1456
2019	5.2853	1.2939
2020	6.0797	1.4050
2021	6.8364	1.5428
2022	7.3776	1.5988
2023	7.7614	1.6260
2024	8.0391	1.6434
2025	8.2417	1.6485

2026	8.3941	1.6571
2027	8.5040	1.6653
2028	8.5865	1.6753
2029	8.6459	1.6854
2030	8.6847	1.6920

Landings Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000	6.7000
2013	0.2032	0.3832	0.4661	0.6697	0.9005	1.1584	1.4200	1.5867	1.9403
2014	0.4187	0.6165	0.7121	0.9325	1.1625	1.4426	1.7295	1.9313	2.2885
2015	0.8824	1.1088	1.2312	1.4444	1.7083	2.0120	2.3102	2.5122	2.9034
2016	1.4880	1.7598	1.9103	2.1923	2.5538	3.0019	3.4952	3.8724	4.7465
2017	2.0617	2.3933	2.5761	2.9595	3.4881	4.1244	4.8762	5.4706	6.6486
2018	2.6117	2.9748	3.2222	3.6979	4.3475	5.1264	6.0720	6.6934	7.9483
2019	3.0662	3.5149	3.7888	4.3569	5.0954	6.0248	7.0401	7.6990	9.0493
2020	3.6227	4.1272	4.4462	5.0761	5.8895	6.8992	7.9935	8.6548	10.1863
2021	4.0738	4.6492	5.0382	5.7318	6.6270	7.7528	8.8895	9.6942	11.2503
2022	4.4476	5.0731	5.4791	6.2358	7.1939	8.3440	9.4937	10.2901	11.8195
2023	4.7292	5.4016	5.8253	6.5939	7.5816	8.7453	9.9120	10.6862	12.2907
2024	4.9362	5.6480	6.0831	6.8680	7.8648	9.0283	10.2100	11.0026	12.6174
2025	5.1165	5.8253	6.2480	7.0600	8.0946	9.2285	10.4395	11.1976	12.7581
2026	5.2504	5.9328	6.3973	7.2108	8.2338	9.4124	10.6190	11.3904	12.9313
2027	5.3826	6.0636	6.4990	7.3069	8.3378	9.5199	10.7466	11.5015	12.9659
2028	5.4432	6.1478	6.5973	7.3808	8.4083	9.6003	10.8426	11.6073	13.1440
2029	5.5132	6.1759	6.6250	7.4271	8.4792	9.6608	10.9304	11.6996	13.2368
2030	5.5401	6.2218	6.6485	7.4568	8.5078	9.7394	10.9712	11.7205	13.2948

Total Fishing Mortality

Year	Average	StdDev
2012	1.0834	0.4679
2013	0.1350	0.0000
2014	0.1350	0.0000
2015	0.1350	0.0000
2016	0.1350	0.0000
2017	0.1350	0.0000
2018	0.1350	0.0000
2019	0.1350	0.0000
2020	0.1350	0.0000
2021	0.1350	0.0000
2022	0.1350	0.0000
2023	0.1350	0.0000
2024	0.1350	0.0000
2025	0.1350	0.0000
2026	0.1350	0.0000
2027	0.1350	0.0000
2028	0.1350	0.0000
2029	0.1350	0.0000
2030	0.1350	0.0000

Total Fishing Mortality Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	0.4962	0.5957	0.6612	0.7880	0.9760	1.2361	1.6371	1.9371	2.9057
2013	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2014	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2015	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2016	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2017	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2018	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2019	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2020	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2021	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2022	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2023	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2024	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2025	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2026	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2027	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2028	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2029	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2030	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350

JAN-1 Stock Numbers at Age - 1000 Fish

2012

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	3470.7100	3582.0200	3630.7900	3733.1100	3845.4000	3970.9800	4083.9300	4158.3900	4317.7200
2	238.3360	346.6600	439.6270	636.1570	927.1550	1288.8100	1707.4100	2053.8300	2637.8900
3	628.9300	792.3810	889.8900	1098.6100	1389.0900	1699.8800	2111.8400	2331.2900	2895.3200
4	924.0740	1046.1800	1143.1600	1345.3900	1586.0550	1844.7200	2088.9300	2260.2700	2689.6800
5	541.8520	638.9290	722.4190	836.8020	993.8315	1180.0600	1357.4100	1491.0000	1750.6100
6	205.2150	265.2180	300.2310	360.2070	439.7105	535.3540	637.8940	691.6980	865.0120
7	82.4731	99.1877	117.2230	146.9100	185.1170	230.8150	283.2270	314.3510	388.2850
8	13.6543	18.2450	21.2075	27.9255	37.2013	48.9121	61.3528	70.3407	89.6368
9+	8.5168	11.6466	14.5945	19.3767	26.8609	36.7221	47.8801	56.9625	73.2486

2013

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2	2772.1830	2879.4390	2925.6390	3017.5850	3116.1935	3223.7790	3321.8420	3382.5990	3514.0610
3	180.8547	276.0112	349.2224	505.0685	733.8209	1021.8920	1359.5790	1624.6980	2110.4460
4	354.5095	479.8330	563.1409	723.9744	935.5559	1169.2580	1472.9230	1648.2210	2039.1320
5	124.1835	281.6267	358.9438	525.1115	715.8858	909.3607	1117.4330	1244.0290	1557.7690
6	28.4119	92.9423	138.7101	222.4531	335.6241	465.1009	599.7590	699.4693	882.5237
7	9.6573	32.7927	49.1779	88.4598	138.5321	198.2678	270.6842	309.5335	411.4671
8	3.4180	12.3660	19.0796	35.9609	57.2525	82.8108	115.3504	141.0983	191.8985
9+	1.0871	4.1610	5.7753	11.8948	19.7171	30.5856	43.9776	53.9206	77.5181

2014

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2	1137.4290	1779.8250	2548.8050	3216.7850	4272.0765	7356.3970	10152.7000	12039.0400	20068.7800
3	2260.5060	2347.9700	2385.6430	2460.6030	2540.9835	2628.7880	2708.7010	2758.2930	2865.4580
4	144.3213	220.2589	278.6824	403.0397	585.5885	815.4635	1084.9680	1296.5170	1684.1340
5	267.3007	361.8091	424.6203	545.8841	705.4379	881.6326	1110.5730	1242.8130	1537.5600
6	89.9187	203.9263	259.9143	380.2200	518.3593	658.4572	809.1356	900.7863	1127.9530
7	20.3784	66.6647	99.4899	159.5529	240.7293	333.6033	430.1818	501.6977	632.9939
8	6.9084	23.4571	35.1780	63.2792	99.0997	141.8273	193.6319	221.4225	294.3505
9+	3.2674	11.8713	17.6902	34.3361	55.6238	81.5095	113.6713	140.3495	190.7658

2015

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2	1127.1350	1815.4210	2522.3270	3217.2680	4267.5945	7447.0390	10268.2700	12002.2300	19392.9500
3	927.4998	1451.2620	2078.4230	2623.0000	3483.5215	5998.6630	8278.1560	9817.0450	16363.8300
4	1803.8980	1873.7200	1903.7660	1963.6150	2027.6830	2097.8010	2161.5680	2201.1180	2286.7030
5	108.8216	166.0778	210.1326	303.8916	441.5414	614.8608	818.0762	977.5977	1269.8780
6	193.5426	261.9803	307.4611	395.2664	510.7921	638.3708	804.1362	899.9271	1113.3080
7	64.4967	146.2708	186.4309	272.7316	371.7994	472.2836	580.3785	646.0918	809.0830
8	14.5778	47.6893	71.1676	114.1350	172.2038	238.6419	307.7250	358.8995	452.8182
9+	7.1428	23.9588	37.4986	70.2311	110.3507	157.5919	220.5132	254.9097	353.6420

2016

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%

1	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2	1118.5380	1756.2910	2537.4690	3216.1820	4267.5195	7516.9450	10086.6300	11980.7700	20034.5600
3	919.0880	1480.2840	2056.7610	2623.4060	3479.8840	6072.5310	8373.2590	9787.0510	15813.1400
4	740.1478	1158.0960	1658.6070	2093.1400	2779.8275	4787.0090	6605.8870	7834.0910	13058.5900
5	1360.1990	1412.8050	1435.4390	1480.6060	1528.9165	1581.7600	1629.8380	1659.6550	1724.1830
6	78.7960	120.2545	152.1540	220.0376	319.7104	445.2202	592.3506	707.8616	919.4970
7	138.8275	187.9157	220.5281	283.5169	366.3587	457.8980	576.7932	645.4663	798.5613
8	46.1388	104.6340	133.3623	195.0892	265.9588	337.8476	415.1666	462.2001	578.7621
9+	15.5172	51.5546	78.9089	133.9235	202.7548	287.6169	373.6398	440.7630	573.4221

2017

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2	1107.8540	1709.4190	2474.4290	3216.2170	4271.8110	7389.9540	9971.1160	12007.5700	20674.5000
3	912.0705	1432.1380	2069.1420	2622.5340	3479.7460	6129.5450	8224.9560	9769.4530	16336.4700
4	733.4144	1181.2650	1641.3140	2093.4530	2776.8990	4845.9020	6681.9280	7809.8560	12619.1600
5	558.1019	873.2225	1250.5980	1578.2670	2096.0060	3609.5080	4980.8150	5906.8700	9846.3210
6	984.8902	1022.9730	1039.3720	1072.0970	1107.0555	1145.3120	1180.1250	1201.7190	1248.4510
7	56.5193	86.2547	109.1358	157.8302	229.3193	319.3508	424.8860	507.7226	659.5540
8	99.3207	134.4227	157.7578	202.8133	262.0764	327.5536	412.6097	461.7149	571.2518
9+	43.2642	112.0174	152.0235	242.0170	340.1456	441.6398	556.5182	627.6485	781.2962

2018

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2	1115.9240	1759.1660	2515.9590	3215.3770	4258.9025	7368.5480	9821.9490	11959.8700	19428.6500
3	903.3702	1393.9150	2017.7090	2622.5540	3483.3230	6025.9050	8130.7350	9791.2270	16858.1700
4	727.8383	1142.8350	1651.2240	2092.7840	2776.8795	4891.4610	6563.2140	7795.9790	13037.0400
5	553.0019	890.6967	1237.5440	1578.4800	2093.7790	3653.8520	5038.2250	5888.7940	9515.1940
6	404.0864	632.2822	905.5343	1142.8020	1517.7015	2613.6220	3606.4860	4277.0250	7129.6010
7	706.4553	733.7385	745.5075	768.9853	794.0588	821.4752	846.4655	861.9576	895.4931
8	40.4308	61.7024	78.0694	112.9007	164.0375	228.4432	303.9477	363.1976	471.8027
9+	119.1199	200.1465	239.0721	329.9581	438.8977	547.4876	663.9831	743.4138	893.5391

2019

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100

2	1100.2330	1853.7570	2546.4220	3219.5910	4295.6000	7460.3590	9958.5980	11978.3500	19331.8100
3	909.9492	1434.4700	2051.4950	2621.8620	3472.7550	6008.5690	8008.8830	9752.1880	15841.6400
4	720.8946	1112.3320	1610.1070	2092.8270	2779.6765	4808.5690	6488.2460	7813.2220	13452.9700
5	548.7850	861.7011	1245.0160	1577.9510	2093.7875	3688.2640	4948.5970	5878.0740	9829.8000
6	400.4097	644.9303	896.0754	1142.9560	1516.0855	2645.7210	3647.9490	4263.9800	6889.9040
7	289.8505	453.5339	649.5140	819.6927	1088.6110	1874.6280	2586.8190	3067.8090	5113.9750
8	505.3450	524.8725	533.3107	550.1013	568.0214	587.6329	605.5077	616.5921	640.5715
9+	143.5285	229.5783	265.9414	344.7631	433.1209	544.0324	647.5610	718.5444	884.8963

2020

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2	1110.3190	1819.1110	2552.7440	3219.6580	4288.2935	7373.3010	9989.3370	11961.9400	19735.8800
3	897.1829	1511.5700	2076.3240	2625.3310	3502.6825	6083.4420	8120.6390	9767.6120	15763.4300
4	726.1269	1144.7000	1637.0580	2092.2290	2771.2705	4794.8340	6391.0380	7782.1220	12641.6300
5	543.5649	838.6869	1214.0580	1578.0010	2095.8945	3625.7510	4892.1270	5891.3320	10143.4600
6	397.3667	623.9588	901.4730	1142.5420	1516.0840	2670.5180	3583.1550	4256.0880	7117.7840
7	287.1973	462.5921	642.7341	819.8184	1087.4505	1897.6700	2616.5300	3058.4810	4942.0150
8	207.3435	324.4391	464.6172	586.3600	778.7360	1341.0060	1850.4120	2194.5190	3658.2690
9+	479.9075	544.3608	582.3023	644.6083	718.6182	805.1756	889.5685	946.8920	1072.0200

2021

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2	1113.1630	1798.9530	2518.2430	3218.2750	4258.8600	7316.0820	10010.1000	11976.6700	19491.1200
3	905.4221	1483.3790	2081.5400	2625.3460	3496.8470	6012.0340	8145.3940	9754.2340	16092.9400
4	715.9504	1206.1900	1656.8960	2094.9840	2795.1080	4854.5570	6480.4340	7794.8400	12579.2700
5	547.5061	863.1365	1234.3780	1577.5440	2089.5550	3615.1990	4818.9570	5867.7190	9531.9450
6	393.5883	607.2635	879.0850	1142.5670	1517.5775	2625.2960	3542.3160	4265.6540	7344.6280
7	285.0155	447.5357	646.5931	819.5276	1087.4305	1915.3760	2570.0800	3052.6850	5105.4040
8	205.4528	330.9105	459.7776	586.4493	777.9032	1357.5000	1871.6980	2187.9410	3535.2590
9+	608.9606	738.7195	810.8935	929.5030	1112.8390	1484.4570	1880.9660	2119.7800	3114.6870

2022

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2	1122.0950	1745.8170	2496.1190	3217.7300	4285.5670	7478.6080	10129.3900	11978.3200	19826.1800

3	907.7031	1466.8820	2053.4650	2624.2580	3472.8015	5965.7690	8162.6660	9766.0380	15893.5400
4	722.5143	1183.7110	1661.0710	2095.0130	2790.4765	4797.5880	6500.2480	7783.9600	12842.6600
5	539.8292	909.4674	1249.3740	1579.6420	2107.5500	3660.2110	4886.3420	5877.4360	9484.5080
6	396.4355	624.9748	893.7929	1142.2610	1513.0145	2617.6950	3489.2880	4248.6460	6901.8430
7	282.3152	435.5614	630.5441	819.5519	1088.4860	1882.9780	2540.7810	3059.5500	5268.0820
8	203.8908	320.1367	462.5437	586.2388	777.8717	1370.1540	1838.4360	2183.6570	3652.0590
9+	795.1220	938.6173	1028.8140	1203.4410	1525.3520	1933.6800	2391.9230	2769.5760	3551.3690

2023

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2	1117.1360	1806.0780	2552.7390	3218.3690	4286.9890	7499.5600	10155.9400	11998.0200	19918.7900
3	914.9950	1423.6360	2035.3120	2623.7840	3494.5420	6098.2760	8259.7820	9767.6200	16166.9100
4	724.3465	1170.5540	1638.7150	2094.1550	2771.2765	4760.6900	6513.7770	7793.0330	12682.8900
5	544.7678	892.5291	1252.4560	1579.6570	2104.0380	3617.5190	4901.3330	5868.9660	9683.3850
6	390.8747	658.5197	904.6899	1143.7760	1526.0155	2650.3490	3538.0910	4255.8390	6867.7370
7	284.3454	448.2645	641.1104	819.3222	1085.2335	1877.5420	2502.7720	3047.4440	4950.4200
8	201.9511	311.5694	451.0427	586.2537	778.6482	1346.9920	1817.5090	2188.6270	3768.5410
9+	938.1354	1115.4850	1212.4580	1450.1420	1803.2695	2243.9260	2746.4430	3118.2310	3909.5590

2024

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2	1132.2230	1814.5720	2562.1120	3217.0910	4300.4750	7489.8460	10119.1400	12000.8200	20241.7400
3	910.9620	1472.7320	2081.5520	2624.3320	3495.7625	6115.2360	8281.0480	9783.7310	16242.4700
4	730.1470	1136.0870	1624.1820	2093.7560	2788.6430	4866.4010	6591.1230	7794.3790	12901.2900
5	546.1708	882.6226	1235.6340	1579.0210	2089.6065	3589.4960	4911.4410	5875.8230	9562.9530
6	394.4643	646.2357	906.8787	1143.7910	1523.4715	2619.3190	3548.9320	4249.6220	7011.9480
7	280.3581	472.3332	648.9195	820.3935	1094.5570	1900.9560	2537.7190	3052.6620	4926.0240
8	203.4054	320.6577	458.6080	586.0834	776.3060	1343.0700	1790.3670	2179.9810	3541.2940
9+	1053.3620	1242.3540	1365.4850	1625.9650	1998.4970	2450.4580	2982.2250	3362.4590	4174.8550

2025

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2	1135.8140	1801.6740	2589.7970	3220.9010	4293.0390	7490.7490	10050.5500	11938.5000	19692.4400
3	923.2274	1479.6400	2089.1810	2623.3180	3506.6925	6107.5390	8251.3360	9785.7750	16505.0000

4	726.9456	1175.2590	1661.0460	2094.2070	2789.6015	4879.9800	6608.3560	7807.5200	12961.7600
5	550.5285	856.6219	1224.6630	1578.7160	2102.6240	3669.4170	4969.7610	5877.0090	9727.6770
6	395.4846	639.0430	894.6831	1143.3120	1513.0245	2599.0220	3556.2970	4254.6180	6924.3350
7	282.9370	463.5243	650.4861	820.4137	1092.7505	1878.8140	2545.5600	3047.9630	5029.4130
8	200.5556	337.8791	464.1910	586.8608	782.9774	1359.8330	1815.2730	2183.7390	3523.7750
9+	1155.3890	1360.9620	1496.3570	1755.3070	2134.2535	2605.7510	3099.8520	3480.8690	4285.4190

2026

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2	1098.9910	1759.9650	2496.4440	3218.9080	4318.4955	7605.9580	10246.9400	12111.4800	20506.6100
3	926.1603	1469.1060	2111.7380	2626.4200	3500.5540	6108.1170	8195.7400	9734.3520	16057.9000
4	736.7365	1180.7020	1667.1500	2093.3880	2798.3635	4873.6630	6584.5210	7808.8900	13170.9200
5	548.1240	886.1283	1252.4160	1579.0510	2103.4375	3679.4300	4982.7430	5886.9260	9773.3310
6	398.6278	620.2747	886.7408	1143.1060	1522.4365	2656.9830	3598.7080	4255.4440	7044.0200
7	283.6747	458.3567	641.7349	820.0606	1085.2510	1864.2060	2550.8310	3051.7570	4966.4960
8	202.3875	331.5747	465.3211	586.8867	781.6811	1344.0040	1820.9740	2180.3610	3597.7070
9+	1244.9130	1453.4790	1592.8920	1865.6560	2242.3930	2704.6860	3209.8910	3596.4920	4306.1620

2027

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2	1120.4060	1814.8520	2521.6880	3216.8550	4277.0545	7400.3330	9929.0040	11966.3800	19441.2200
3	896.1530	1435.0920	2035.6250	2624.7770	3521.4825	6202.0110	8355.5180	9876.1740	16721.1500
4	739.0653	1172.3700	1685.1480	2095.8360	2793.4650	4874.1530	6539.8980	7768.1750	12814.2200
5	555.5100	890.2794	1257.0870	1578.4320	2109.9475	3674.8660	4964.6430	5888.1620	9931.0640
6	396.8872	641.6004	906.8340	1143.3280	1523.0570	2664.2110	3607.9050	4262.6050	7076.6060
7	285.9303	444.9133	636.0009	819.9162	1091.9740	1905.7540	2581.1770	3052.3190	5052.3570
8	202.9252	327.8861	459.0761	586.6375	776.3278	1333.5410	1824.6850	2183.1130	3552.7040
9+	1318.7530	1530.5770	1663.9550	1932.0320	2308.8750	2773.0190	3293.8490	3647.6770	4328.6160

2028

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2	1122.3550	1777.0520	2507.1660	3218.4690	4294.7995	7445.5530	10207.0900	11931.5200	19973.1800
3	913.6154	1479.8940	2056.3010	2623.1170	3487.6545	6034.2250	8096.5010	9757.5090	15852.4500
4	715.1183	1145.2260	1624.4070	2094.5900	2810.1935	4949.2860	6667.6650	7881.1290	13343.9300

5	557.2712	883.9569	1270.6200	1580.2900	2106.3065	3675.2150	4931.1400	5857.3480	9662.3150
6	402.2155	644.6363	910.2400	1142.9580	1527.8020	2660.8500	3594.6890	4263.4810	7190.8020
7	284.6822	460.1916	650.4455	820.0928	1092.4640	1910.9580	2587.7370	3057.3940	5075.7810
8	204.5337	318.2569	454.9625	586.5204	781.1341	1363.1900	1846.4230	2183.4810	3614.1300
9+	1333.4110	1564.6740	1707.0000	1979.4770	2364.4425	2816.2120	3321.9770	3667.5580	4458.6810

2029

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2	1146.9520	1825.8780	2533.1740	3216.0540	4273.1920	7436.8880	9982.7790	12020.5300	20087.0900
3	915.1834	1449.0300	2044.4310	2624.3870	3502.0805	6071.2660	8323.0760	9729.7040	16286.4600
4	729.0603	1180.9470	1640.9330	2093.2210	2783.1265	4815.3150	6460.9950	7786.1430	12650.3900
5	539.2058	863.5367	1224.8510	1579.3430	2118.8795	3731.7980	5027.4520	5942.4630	10061.1600
6	403.5078	640.0272	920.0044	1144.2550	1525.1530	2661.1810	3570.5820	4241.1460	6996.3680
7	288.4917	462.3770	652.8683	819.8329	1095.8280	1908.6070	2578.3970	3058.1590	5157.6910
8	203.6445	329.1968	465.2836	586.6442	781.4661	1366.9710	1851.1640	2187.0620	3630.9690
9+	1375.4580	1589.4800	1737.7940	2018.3200	2406.4485	2859.1170	3357.9380	3722.8870	4558.6730

2030

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600
2	1124.7080	1841.7020	2554.3980	3218.6290	4288.7635	7612.1460	10195.3400	12087.5800	20333.3600
3	935.2335	1488.8820	2065.5470	2622.4250	3484.4485	6064.3130	8140.2000	9801.7930	16379.3900
4	730.3032	1156.3430	1631.4780	2094.2830	2794.6895	4844.8300	6641.6250	7764.2580	12996.6700
5	549.7191	890.4454	1237.3120	1578.3320	2098.4885	3630.8150	4871.6050	5870.8170	9538.4670
6	390.4187	625.2924	886.8581	1143.5690	1534.2755	2702.0540	3640.3260	4302.7940	7284.9630
7	289.4232	459.0681	659.9237	820.7497	1093.9710	1908.8080	2561.0230	3042.0550	5018.1650
8	206.3692	330.7607	467.0243	586.4444	783.9130	1365.2560	1844.4530	2187.6730	3689.6090
9+	1412.5860	1621.1890	1761.7730	2051.7810	2430.4745	2892.0430	3407.6940	3767.6010	4554.2580

Requested Percentile Report

Percentile = 90.00 %

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Recruits	12417.3800	12558.8100	12336.3400	12195.0400	12012.8400	12179.7600	12217.6500	12242.8800	12388.5500	12421.2300	12376.0000	12291.8500	12532.5100	12143.3200	12483.8100	12208.9400	12469.8800	12089.6900	11930.1300

```
Spawning Stock Biomass        11.4842    10.7648    13.8544    19.5943    28.5318    38.0922
46.1718    52.3447    59.1503    66.9303    71.7896    75.1497    77.7217    79.4209    80.7713
81.9559    82.5775    83.1237    83.5932
Jan-1 Stock Biomass           16.4055    14.9009    20.4987    29.0393    39.7382    50.3326
58.4965    65.0894    72.3081    80.6526    86.0296    89.8622    92.7014    94.3116    96.0246
97.0317    97.8675    98.2806    98.8185
Mean Biomass                  17.1045    18.9828    27.0224    38.5116    50.5072    60.7041
68.4468    74.8872    81.3386    87.9312    92.3559    95.7880    98.1454    99.8048   101.1171
102.0755   102.7972   103.2039   103.2939
Combined Catch Biomass         6.7000     1.4200     1.7295     2.3102     3.4952     4.8762
6.0720     7.0401     7.9935     8.8895     9.4937     9.9120    10.2100    10.4395    10.6190
10.7466    10.8426    10.9304    10.9712
Landings                       6.7000     1.4200     1.7295     2.3102     3.4952     4.8762
6.0720     7.0401     7.9935     8.8895     9.4937     9.9120    10.2100    10.4395    10.6190
10.7466    10.8426    10.9304    10.9712
FMort                          1.6371     0.1350     0.1350     0.1350     0.1350     0.1350
0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350
0.1350     0.1350     0.1350     0.1350

Stock Numbers at Age
Age 1                       4083.9300 12417.3800 12558.8100 12336.3400 12195.0400 12012.8400
12179.7600 12217.6500 12242.8800 12388.5500 12421.2300 12376.0000 12291.8500 12532.5100
12143.3200 12483.8100 12208.9400 12469.8800 12089.6900
Age 2                       1707.4100  3321.8420 10152.7000 10268.2700 10086.6300  9971.1160
9821.9490  9958.5980  9989.3370 10010.1000 10129.3900 10155.9400 10119.1400 10050.5500 10246.9400
9929.0040 10207.0900  9982.7790 10195.3400
Age 3                       2111.8400  1359.5790  2708.7010  8278.1560  8373.2590  8224.9560
8130.7350  8008.8830  8120.6390  8145.3940  8162.6660  8259.7820  8281.0480  8251.3360  8195.7400
8355.5180  8096.5010  8323.0760  8140.2000
Age 4                       2088.9300  1472.9230  1084.9680  2161.5680  6605.8870  6681.9280
6563.2140  6488.2460  6391.0380  6480.4340  6500.2480  6513.7770  6591.1230  6608.3560  6584.5210
6539.8980  6667.6650  6460.9950  6641.6250
Age 5                       1357.4100  1117.4330  1110.5730   818.0762  1629.8380  4980.8150
5038.2250  4948.5970  4892.1270  4818.9570  4886.3420  4901.3330  4911.4410  4969.7610  4982.7430
4964.6430  4931.1400  5027.4520  4871.6050
Age 6                        637.8940   599.7590   809.1356   804.1362   592.3506  1180.1250
3606.4860  3647.9490  3583.1550  3542.3160  3489.2880  3538.0910  3548.9320  3556.2970  3598.7080
3607.9050  3594.6890  3570.5820  3640.3260
Age 7                        283.2270   270.6842   430.1818   580.3785   576.7932   424.8860
846.4655  2586.8190  2616.5300  2570.0800  2540.7810  2502.7720  2537.7190  2545.5600  2550.8310
2581.1770  2587.7370  2578.3970  2561.0230
Age 8                         61.3528   115.3504   193.6319   307.7250   415.1666   412.6097
303.9477   605.5077  1850.4120  1871.6980  1838.4360  1817.5090  1790.3670  1815.2730  1820.9740
1824.6850  1846.4230  1851.1640  1844.4530
Age 9                         47.8801    43.9776   113.6713   220.5132   373.6398   556.5182
663.9831   647.5610   889.5685  1880.9660  2391.9230  2746.4430  2982.2250  3099.8520  3209.8910
3293.8490  3321.9770  3357.9380  3407.6940
```

Scenario 1 Projection

```
AGEPRO VERSION 4.2

SAW55_3BLOCK_BASE

Date & Time of Run: 01 Mar 2013  11:47

Input File Name:
D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\GOMCOD_SAW55_3BLOCK_BASE_SHORT_75FMSY_12CAT4891_SCENARIO1.INP

First Age Class:                          1
Number of Age Classes:                    9
Number of Years in Projection:           19
Number of Fleets:                         1
Number of Recruitment Models:             1
Number of Bootstraps:                  1000
Number of Simulations:                   10

Bootstrap File Name:            D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\SAW55_3BLOCK_BASE_MCMC.BSN

Number of Feasible Solutions:      10000  of      10000 Realizations
```

Input Harvest Scenario

Year	Type	Value
2012	Landings	4891
2013	F-Mult	0.1350
2014	F-Mult	0.1350
2015	F-Mult	0.1350
2016	F-Mult	0.1350
2017	F-Mult	0.1350
2018	F-Mult	0.1350
2019	F-Mult	0.1350
2020	F-Mult	0.1350
2021	F-Mult	0.1350
2022	F-Mult	0.1350
2023	F-Mult	0.1350
2024	F-Mult	0.1350
2025	F-Mult	0.1350
2026	F-Mult	0.1350
2027	F-Mult	0.1350
2028	F-Mult	0.1350
2029	F-Mult	0.1350
2030	F-Mult	0.1350

Recruits 1000 Fish

Year Class	Average	StdDev
2012	6926.7937	4465.8077
2013	6923.5380	4386.4587
2014	6937.4571	4438.1684
2015	6919.2931	4527.0696
2016	6848.1821	4336.7865
2017	6927.8128	4327.1141
2018	6904.8750	4345.1040
2019	6853.8386	4341.3137
2020	6939.1845	4398.8850
2021	6952.5694	4402.3823
2022	6973.7562	4462.6114
2023	6932.3252	4365.9713
2024	7044.3441	4564.4314
2025	6897.3804	4358.1031
2026	6933.3608	4380.3428
2027	6924.7521	4452.7725
2028	7017.1113	4540.7667
2029	6852.1367	4397.8307
2030	6883.5775	4300.2626

Recruits Distribution

Year Class	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2013	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2014	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2015	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2016	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2017	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2018	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2019	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2020	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2021	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300

2022	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600
24755.9700								
2023	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300
24085.3500								
2024	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500
25080.2100								
2025	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800
23778.2800								
2026	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200
24428.4200								
2027	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200
24567.2500								
2028	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500
24868.9800								
2029	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400
24672.3600								
2030	1347.1080	2222.8420	3135.0670	3934.5510	5235.3460	9103.0150	11930.1300	14588.2800
23922.8900								

Spawning Stock Biomass x 1000 MT

Year	Average	StdDev
2012	8.9021	2.3117
2013	8.7575	2.7065
2014	11.5084	2.9167
2015	16.3147	3.5951
2016	23.0019	5.3685
2017	29.8911	7.1625
2018	35.6704	8.3646
2019	40.5709	9.2297
2020	46.3324	9.9422
2021	52.2569	11.2037
2022	56.4875	11.7405
2023	59.5175	12.0086
2024	61.7005	12.1823
2025	63.2750	12.2105
2026	64.4634	12.2510
2027	65.3224	12.3115
2028	65.9271	12.4036
2029	66.3865	12.4648
2030	66.7053	12.5129

Spawning Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	4.1678	5.4285	6.0006	7.3226	8.7077	10.2516	11.9738	13.0674	15.1028
2013	3.4059	4.7422	5.4076	6.8670	8.4704	10.3360	12.2816	13.5479	16.0741
2014	5.7224	7.1851	7.9799	9.4710	11.2264	13.2033	15.3401	16.7986	19.4106
2015	9.3367	11.1083	12.0653	13.8272	15.9051	18.4405	21.0415	22.9131	26.6633
2016	13.6287	15.7315	16.9428	19.2593	22.2549	25.9080	29.9423	32.9377	39.7487
2017	17.7848	20.2713	21.8655	24.7486	28.8365	33.7100	39.3578	43.5429	51.3747
2018	21.4505	24.1911	26.1385	29.6442	34.4317	40.1954	47.1592	51.3653	60.1968
2019	24.4693	27.8278	29.8340	33.9863	39.2731	45.9547	53.0497	57.6098	67.4360
2020	28.5820	32.4393	34.6939	39.1892	45.0192	52.1830	59.6956	64.6308	75.0036
2021	32.1116	36.3574	39.1224	44.2268	50.8662	58.8747	67.3024	72.8969	84.0571
2022	34.7165	39.4152	42.4871	48.0626	55.1775	63.5720	72.0561	77.6469	89.4084
2023	37.0272	41.9422	45.1407	50.9338	58.2572	66.7757	75.3589	81.1903	92.8392

2024	38.4214	43.7979	47.1694	52.9936	60.5729	69.0414	77.8568	83.6541	96.0376
2025	39.9149	45.1890	48.4861	54.5538	62.1563	70.6028	79.5157	85.0641	96.8173
2026	40.8669	46.3496	49.6695	55.7454	63.4142	72.0282	80.8350	86.5304	97.3902
2027	41.8038	47.2406	50.4117	56.4602	64.1267	72.9243	82.0011	87.4767	98.3907
2028	42.3962	47.6993	51.0385	56.9700	64.6850	73.4296	82.6142	88.1820	99.3243
2029	43.1380	47.9915	51.3191	57.3616	65.1801	74.0776	83.1519	88.8147	100.5131
2030	43.2225	48.3461	51.6642	57.5888	65.4209	74.4196	83.6105	89.1561	100.3581

JAN-1 Stock Biomass x 1000 MT

Year	Average	StdDev
2012	12.8419	2.7428
2013	12.3751	3.2424
2014	17.0505	3.8051
2015	23.7053	5.2844
2016	31.6605	7.3410
2017	39.3515	9.1376
2018	45.6508	10.2955
2019	50.9762	11.0965
2020	57.2418	11.7572
2021	63.6797	13.0248
2022	68.2914	13.5783
2023	71.6116	13.8754
2024	74.0035	14.0701
2025	75.7290	14.0980
2026	77.0316	14.1426
2027	77.9552	14.2312
2028	78.5916	14.3388
2029	79.0913	14.3852
2030	79.4444	14.4249

JAN-1 Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	7.2801	8.7308	9.4238	10.9381	12.5757	14.4349	16.4055	17.7124	20.3350
2013	5.9034	7.5485	8.4374	10.1125	12.0875	14.2579	16.5899	18.2453	21.1060
2014	9.5581	11.4120	12.4903	14.3870	16.6664	19.3681	22.1197	23.9528	27.3902
2015	14.1910	16.3560	17.6399	20.0275	23.0417	26.6205	30.5988	33.3513	39.8136
2016	19.0177	21.7182	23.3702	26.4672	30.6232	35.5392	41.2802	45.5598	53.9985
2017	23.8050	26.8364	28.9454	32.7897	38.0780	44.2774	51.7082	56.6072	66.7096
2018	27.8213	31.4450	33.7296	38.2640	44.1986	51.5639	59.5691	64.7317	75.5744
2019	31.2395	35.3971	37.9984	42.9816	49.5247	57.5187	65.8662	71.2967	83.5476
2020	36.0316	40.4933	43.4060	48.8892	55.7820	64.2582	72.8714	78.9484	90.4243
2021	39.6171	44.9844	48.2154	54.3910	62.2116	71.4813	81.0644	87.6373	99.7499
2022	42.6850	48.4325	52.0892	58.5504	66.8908	76.5462	86.3035	92.5499	105.9551
2023	45.1824	51.2174	55.0083	61.7534	70.2289	80.0657	90.0687	96.3439	110.2587
2024	46.8118	53.2284	57.0164	63.9996	72.7810	82.4526	92.8440	99.0354	113.3892
2025	48.6388	54.7079	58.6327	65.6611	74.4174	84.4141	94.4231	101.1603	114.0938

2026	49.4855	56.1704	59.8903	66.9640	75.7716	85.8757	96.0991	102.3537
114.5109								
2027	50.6187	57.0503	60.7591	67.7840	76.6228	86.7723	97.0861	103.4790
115.6066								
2028	51.4018	57.3131	61.2505	68.3687	77.1563	87.3631	97.9042	104.2256
117.3889								
2029	52.0482	57.7902	61.6989	68.7019	77.7643	87.9954	98.3078	104.8939
118.3539								
2030	51.7910	58.1955	62.0478	68.9699	78.1060	88.4826	98.8398	105.2167
117.7199								

Mean Biomass x 1000 MT

Year	Average	StdDev
2012	13.6853	3.3757
2013	15.8096	3.7188
2014	22.2262	4.8918
2015	30.5896	7.2400
2016	39.1946	9.5297
2017	46.7484	11.0747
2018	53.0200	12.0793
2019	58.4214	12.7711
2020	64.1293	13.2779
2021	69.5956	14.0708
2022	73.5143	14.4479
2023	76.3586	14.6741
2024	78.4233	14.8262
2025	79.9262	14.8682
2026	81.0432	14.9295
2027	81.8340	15.0362
2028	82.3660	15.1311
2029	82.7831	15.1450
2030	83.0809	15.1699

Mean Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%
99%								
2012	6.8265	8.5923	9.4871	11.3661	13.3458	15.6329	18.1084	19.6050
22.5742								
2013	8.3050	10.2545	11.3311	13.1851	15.4761	18.0924	20.7160	22.5266
25.7101								
2014	13.0712	15.3135	16.5562	18.8366	21.6154	24.9559	28.6066	31.1108
36.7070								
2015	18.2016	21.0456	22.5004	25.5182	29.5195	34.3668	39.9860	44.2273
53.3793								
2016	23.2860	26.3922	28.4922	32.3604	37.7660	44.2347	51.8779	57.4171
67.7184								
2017	27.7306	31.5611	34.0264	38.7670	45.0974	52.9018	61.8975	67.4891
79.4680								
2018	31.8910	36.3063	38.9662	44.4281	51.3980	60.0827	69.3529	75.2811
88.3357								
2019	35.4713	40.4120	43.4251	49.2377	56.8129	66.0232	75.5383	81.9771
95.1228								
2020	39.9412	45.0335	48.3868	54.6798	62.5181	72.1691	81.8200	88.7610
101.3416								
2021	43.1759	49.1130	52.8479	59.5665	68.0770	78.2053	88.2957	95.1955
108.6413								
2022	46.0331	52.3011	56.2369	63.2211	72.1352	82.3436	92.6187	99.2172
113.2195								
2023	48.0665	54.6409	58.7001	65.9016	74.9406	85.1169	95.9675	102.3783
117.0742								
2024	49.9739	56.4823	60.4139	67.8046	77.0721	87.4291	98.2835	105.0158
118.4311								
2025	51.1191	57.8910	61.8993	69.3882	78.6413	89.1527	99.8975	106.5789
120.0833								
2026	52.0343	59.1921	62.9709	70.3844	79.6222	90.3247	101.1864	107.6834
120.9358								
2027	53.2409	59.6986	63.6755	71.0570	80.2733	90.9778	102.1199	108.7640
122.2347								

2028	54.0561	60.0930	64.0557	71.4728	80.8321	91.6692	102.8297	109.7640
123.1770								
2029	53.9226	60.4597	64.4104	71.8347	81.3939	92.2457	103.2268	109.9214
123.6949								
2030	54.1287	60.9021	64.8407	72.1044	81.7508	92.4666	103.3099	110.1475
123.2826								

Combined Catch Biomass x 1000 MT

Year	Average	StdDev
2012	4.8910	0.0000
2013	1.1451	0.3761
2014	1.4152	0.4042
2015	1.9436	0.4295
2016	2.8344	0.6623
2017	3.8003	0.9537
2018	4.6430	1.1450
2019	5.3760	1.2936
2020	6.1455	1.4048
2021	6.8835	1.5428
2022	7.4112	1.5988
2023	7.7855	1.6260
2024	8.0564	1.6434
2025	8.2541	1.6485
2026	8.4029	1.6571
2027	8.5103	1.6653
2028	8.5910	1.6753
2029	8.6492	1.6854
2030	8.6870	1.6920

Combined Catch Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%
99%								
2012	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910
4.8910								
2013	0.3917	0.5833	0.6740	0.8814	1.1142	1.3729	1.6360	1.8043
2.1611								
2014	0.6171	0.8211	0.9174	1.1392	1.3714	1.6528	1.9409	2.1437
2.5004								
2015	1.0759	1.3045	1.4273	1.6413	1.9057	2.2109	2.5096	2.7120
3.1025								
2016	1.6706	1.9448	2.0954	2.3774	2.7388	3.1872	3.6799	4.0567
4.9325								
2017	2.2275	2.5578	2.7386	3.1234	3.6514	4.2864	5.0384	5.6328
6.8094								
2018	2.7418	3.1028	3.3470	3.8239	4.4715	5.2522	6.1985	6.8163
8.0673								
2019	3.1587	3.6085	3.8824	4.4479	5.1860	6.1148	7.1323	7.7895
9.1400								
2020	3.6889	4.1917	4.5110	5.1413	5.9548	6.9642	8.0580	8.7203
10.2521								
2021	4.1204	4.6958	5.0845	5.7790	6.6760	7.8003	8.9377	9.7386
11.2969								
2022	4.4801	5.1051	5.5120	6.2697	7.2274	8.3781	9.5293	10.3240
11.8528								
2023	4.7520	5.4247	5.8490	6.6186	7.6057	8.7707	9.9358	10.7087
12.3128								
2024	4.9530	5.6655	6.1006	6.8852	7.8833	9.0471	10.2267	11.0208
12.6342								
2025	5.1284	5.8371	6.2601	7.0731	8.1067	9.2411	10.4525	11.2109
12.7710								
2026	5.2587	5.9419	6.4061	7.2195	8.2428	9.4215	10.6277	11.3993
12.9399								
2027	5.3890	6.0699	6.5055	7.3133	8.3444	9.5264	10.7533	11.5077
12.9721								
2028	5.4477	6.1528	6.6015	7.3850	8.4127	9.6046	10.8470	11.6119
13.1485								
2029	5.5165	6.1789	6.6282	7.4301	8.4823	9.6640	10.9337	11.7028
13.2400								

2030	5.5424	6.2242	6.6509	7.4592	8.5100	9.7420	10.9733	11.7230	13.2970

Landings x 1000 MT

Year	Average	StdDev
2012	4.8910	0.0000
2013	1.1451	0.3761
2014	1.4152	0.4042
2015	1.9436	0.4295
2016	2.8344	0.6623
2017	3.8003	0.9537
2018	4.6430	1.1450
2019	5.3760	1.2936
2020	6.1455	1.4048
2021	6.8835	1.5428
2022	7.4112	1.5988
2023	7.7855	1.6260
2024	8.0564	1.6434
2025	8.2541	1.6485
2026	8.4029	1.6571
2027	8.5103	1.6653
2028	8.5910	1.6753
2029	8.6492	1.6854
2030	8.6870	1.6920

Landings Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910	4.8910
2013	0.3917	0.5833	0.6740	0.8814	1.1142	1.3729	1.6360	1.8043	2.1611
2014	0.6171	0.8211	0.9174	1.1392	1.3714	1.6528	1.9409	2.1437	2.5004
2015	1.0759	1.3045	1.4273	1.6413	1.9057	2.2109	2.5096	2.7120	3.1025
2016	1.6706	1.9448	2.0954	2.3774	2.7388	3.1872	3.6799	4.0567	4.9325
2017	2.2275	2.5578	2.7386	3.1234	3.6514	4.2864	5.0384	5.6328	6.8094
2018	2.7418	3.1028	3.3470	3.8239	4.4715	5.2522	6.1985	6.8163	8.0673
2019	3.1587	3.6085	3.8824	4.4479	5.1860	6.1148	7.1323	7.7895	9.1400
2020	3.6889	4.1917	4.5110	5.1413	5.9548	6.9642	8.0580	8.7203	10.2521
2021	4.1204	4.6958	5.0845	5.7790	6.6760	7.8003	8.9377	9.7386	11.2969
2022	4.4801	5.1051	5.5120	6.2697	7.2274	8.3781	9.5293	10.3240	11.8528
2023	4.7520	5.4247	5.8490	6.6186	7.6057	8.7707	9.9358	10.7087	12.3128
2024	4.9530	5.6655	6.1006	6.8852	7.8833	9.0471	10.2267	11.0208	12.6342
2025	5.1284	5.8371	6.2601	7.0731	8.1067	9.2411	10.4525	11.2109	12.7710
2026	5.2587	5.9419	6.4061	7.2195	8.2428	9.4215	10.6277	11.3993	12.9399
2027	5.3890	6.0699	6.5055	7.3133	8.3444	9.5264	10.7533	11.5077	12.9721
2028	5.4477	6.1528	6.6015	7.3850	8.4127	9.6046	10.8470	11.6119	13.1485
2029	5.5165	6.1789	6.6282	7.4301	8.4823	9.6640	10.9337	11.7028	13.2400
2030	5.5424	6.2242	6.6509	7.4592	8.5100	9.7420	10.9733	11.7230	13.2970

Total Fishing Mortality

Year	Average	StdDev
2012	0.6789	0.2267
2013	0.1350	0.0000
2014	0.1350	0.0000
2015	0.1350	0.0000
2016	0.1350	0.0000
2017	0.1350	0.0000
2018	0.1350	0.0000
2019	0.1350	0.0000
2020	0.1350	0.0000
2021	0.1350	0.0000
2022	0.1350	0.0000
2023	0.1350	0.0000
2024	0.1350	0.0000
2025	0.1350	0.0000
2026	0.1350	0.0000
2027	0.1350	0.0000
2028	0.1350	0.0000
2029	0.1350	0.0000
2030	0.1350	0.0000

Total Fishing Mortality Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	0.3418	0.4057	0.4463	0.5239	0.6344	0.7786	0.9816	1.1133	1.4644
2013	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2014	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2015	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2016	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2017	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2018	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2019	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2020	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2021	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2022	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2023	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2024	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2025	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2026	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2027	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2028	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2029	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2030	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350

JAN-1 Stock Numbers at Age - 1000 Fish

2012

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%

1	3470.7100	3582.0200	3630.7900	3733.1100	3845.4000	3970.9800	4083.9300	4158.3900	4317.7200
2	238.3360	346.6600	439.6270	636.1570	927.1550	1288.8100	1707.4100	2053.8300	2637.8900
3	628.9300	792.3810	889.8900	1098.6100	1389.0900	1699.8800	2111.8400	2331.2900	2895.3200
4	924.0740	1046.1800	1143.1600	1345.3900	1586.0550	1844.7200	2088.9300	2260.2700	2689.6800
5	541.8520	638.9290	722.4190	836.8020	993.8315	1180.0600	1357.4100	1491.0000	1750.6100
6	205.2150	265.2180	300.2310	360.2070	439.7105	535.3540	637.8940	691.6980	865.0120
7	82.4731	99.1877	117.2230	146.9100	185.1170	230.8150	283.2270	314.3510	388.2850
8	13.6543	18.2450	21.2075	27.9255	37.2013	48.9121	61.3528	70.3407	89.6368
9+	8.5168	11.6466	14.5945	19.3767	26.8609	36.7221	47.8801	56.9625	73.2486

2013

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2	2806.8590	2901.4410	2943.1780	3033.4800	3127.9890	3233.3400	3328.7360	3389.7280	3520.7220
3	188.7032	278.6798	355.1301	509.6200	745.8122	1032.3490	1373.0960	1649.8330	2126.6090
4	424.1360	540.1851	625.4232	785.7369	997.8132	1237.1980	1563.0700	1740.9680	2147.4130
5	305.1116	455.7513	529.8120	689.7334	879.5943	1075.0240	1282.0810	1409.4520	1727.3990
6	120.5544	194.4087	247.0259	335.3724	456.4754	595.0246	729.7777	830.5036	1018.3770
7	42.3652	72.3701	94.0787	138.2465	194.4438	255.9756	334.0343	371.8285	479.6443
8	15.6509	27.8583	36.6013	55.9895	80.7753	109.4153	143.8921	172.2776	221.1707
9+	5.0961	8.8103	11.2970	18.3452	27.7818	40.1316	55.4956	66.1977	90.0101

2014

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2	1137.4290	1779.8250	2548.8050	3216.7850	4272.0765	7356.3970	10152.7000	12039.0400	20068.7800
3	2288.8200	2365.9290	2399.9640	2473.5760	2550.6260	2636.5150	2714.4070	2764.1060	2870.8880
4	150.5844	222.3884	283.3983	406.6844	595.1525	823.8130	1095.7540	1316.5750	1697.0310
5	319.8090	407.2976	471.5792	592.4410	752.3444	932.8550	1178.5650	1312.7120	1619.1790
6	220.9253	329.9977	383.6290	499.4177	636.8972	778.4017	928.3032	1020.5640	1250.8050
7	86.4702	139.4467	177.1899	240.5584	327.4145	426.7978	523.4402	595.6897	730.4428
8	30.3064	51.7709	67.2959	98.8916	139.0969	183.1120	238.9498	265.9934	343.1102
9+	14.7729	25.9582	34.0677	53.7255	77.9792	106.6549	142.8169	169.2246	225.7707

2015

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900

2	1127.1350	1815.4210	2522.3270	3217.2680	4267.5945	7447.0390	10268.2700	12002.2300	19392.9500
3	927.4998	1451.2620	2078.4230	2623.0000	3483.5215	5998.6630	8278.1560	9817.0450	16363.8300
4	1826.5110	1887.9810	1915.2020	1973.9080	2035.4255	2103.9820	2166.1010	2205.7790	2291.0360
5	113.5449	167.6836	213.6872	306.6412	448.7459	621.1530	826.2097	992.7218	1279.6030
6	231.5741	294.9156	341.4695	428.9884	544.7469	675.4656	853.3691	950.5163	1172.4350
7	158.4599	236.6974	275.1694	358.2355	456.8309	558.3328	665.8448	732.0022	897.1441
8	61.8555	99.7501	126.7464	172.0800	234.2131	305.2946	374.4498	426.1253	522.5237
9+	33.6145	56.3876	72.9893	110.1880	154.7461	205.3874	272.9293	309.5812	415.7801

2016

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2	1118.5380	1756.2910	2537.4690	3216.1820	4267.5195	7516.9450	10086.6300	11980.7700	20034.5600
3	919.0880	1480.2840	2056.7610	2623.4060	3479.8840	6072.5310	8373.2590	9787.0510	15813.1400
4	740.1478	1158.0960	1658.6070	2093.1400	2779.8275	4787.0090	6605.8870	7834.0910	13058.5900
5	1377.1980	1423.5400	1444.0740	1488.3280	1534.7105	1586.4210	1633.2570	1663.1610	1727.4500
6	82.2161	121.4173	154.7278	222.0356	324.9289	449.7727	598.2402	718.8126	926.5388
7	166.0979	211.5319	244.9320	307.6982	390.7368	484.4903	612.1022	681.7743	840.9505
8	113.3551	169.3204	196.8468	256.2646	326.7878	399.3979	476.3042	523.6452	641.7858
9+	68.3060	113.3071	144.6505	205.9322	280.3944	369.7425	457.2151	526.3770	666.3360

2017

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2	1107.8540	1709.4190	2474.4290	3216.2170	4271.8110	7389.9540	9971.1160	12007.5700	20674.5000
3	912.0705	1432.1380	2069.1420	2622.5340	3479.7460	6129.5450	8224.9560	9769.4530	16336.4700
4	733.4144	1181.2650	1641.3140	2093.4530	2776.8990	4845.9020	6681.9280	7809.8560	12619.1600
5	558.1019	873.2225	1250.5980	1578.2670	2096.0060	3609.5080	4980.8150	5906.8700	9846.3210
6	997.1823	1030.7500	1045.6350	1077.6450	1111.2480	1148.7020	1182.6160	1204.3260	1250.8160
7	58.9724	87.0888	110.9820	159.2592	233.0593	322.6110	429.1105	515.5766	664.6056
8	118.8187	151.3160	175.2145	220.1223	279.5135	346.5852	437.8615	487.7239	601.5765
9+	132.3120	206.6951	248.7908	337.8307	439.1044	542.7139	656.0730	731.8077	888.3017

2018

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2	1115.9240	1759.1660	2515.9590	3215.3770	4258.9025	7368.5480	9821.9490	11959.8700	19428.6500

3	903.3702	1393.9150	2017.7090	2622.5540	3483.3230	6025.9050	8130.7350	9791.2270	16858.1700
4	727.8383	1142.8350	1651.2240	2092.7840	2776.8795	4891.4610	6563.2140	7795.9790	13037.0400
5	553.0019	890.6967	1237.5440	1578.4800	2093.7790	3653.8520	5038.2250	5888.7940	9515.1940
6	404.0864	632.2822	905.5343	1142.8020	1517.7015	2613.6220	3606.4860	4277.0250	7129.6010
7	715.2603	739.3220	750.0066	772.9680	797.0729	823.9300	848.2853	863.8092	897.1900
8	42.1855	62.2991	79.3901	113.9271	166.7178	230.7770	306.9698	368.8165	475.4163
9+	205.1427	286.3530	326.4580	416.2953	522.9001	628.9635	746.6312	824.6861	978.2823

2019

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2	1100.2330	1853.7570	2546.4220	3219.5910	4295.6000	7460.3590	9958.5980	11978.3500	19331.8100
3	909.9492	1434.4700	2051.4950	2621.8620	3472.7550	6008.5690	8008.8830	9752.1880	15841.6400
4	720.8946	1112.3320	1610.1070	2092.8270	2779.6765	4808.5690	6488.2460	7813.2220	13452.9700
5	548.7850	861.7011	1245.0160	1577.9510	2093.7875	3688.2640	4948.5970	5878.0740	9829.8000
6	400.4097	644.9303	896.0754	1142.9560	1516.0855	2645.7210	3647.9490	4263.9800	6889.9040
7	289.8505	453.5339	649.5140	819.6927	1088.6110	1874.6280	2586.8190	3067.8090	5113.9750
8	511.6602	528.8753	536.5068	552.9400	570.1737	589.3939	606.8184	617.9308	641.7853
9+	207.4515	291.9937	327.8982	408.0701	494.7770	606.6710	709.9610	781.3217	945.5805

2020

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2	1110.3190	1819.1110	2552.7440	3219.6580	4288.2935	7373.3010	9989.3370	11961.9400	19735.8800
3	897.1829	1511.5700	2076.3240	2625.3310	3502.6825	6083.4420	8120.6390	9767.6120	15763.4300
4	726.1269	1144.7000	1637.0580	2092.2290	2771.2705	4794.8340	6391.0380	7782.1220	12641.6300
5	543.5649	838.6869	1214.0580	1578.0010	2095.8945	3625.7510	4892.1270	5891.3320	10143.4600
6	397.3667	623.9588	901.4730	1142.5420	1516.0840	2670.5180	3583.1550	4256.0880	7117.7840
7	287.1973	462.5921	642.7341	819.8184	1087.4505	1897.6700	2616.5300	3058.4810	4942.0150
8	207.3435	324.4391	464.6172	586.3600	778.7360	1341.0060	1850.4120	2194.5190	3658.2690
9+	529.3505	595.0686	629.3277	690.3975	763.9665	849.5042	934.0419	989.6186	1118.3660

2021

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2	1113.1630	1798.9530	2518.2430	3218.2750	4258.8600	7316.0820	10010.1000	11976.6700	19491.1200
3	905.4221	1483.3790	2081.5400	2625.3460	3496.8470	6012.0340	8145.3940	9754.2340	16092.9400

4	715.9504	1206.1900	1656.8960	2094.9840	2795.1080	4854.5570	6480.4340	7794.8400	12579.2700
5	547.5061	863.1365	1234.3780	1577.5440	2089.5550	3615.1990	4818.9570	5867.7190	9531.9450
6	393.5883	607.2635	879.0850	1142.5670	1517.5775	2625.2960	3542.3160	4265.6540	7344.6280
7	285.0155	447.5357	646.5931	819.5276	1087.4305	1915.3760	2570.0800	3052.6850	5105.4040
8	205.4528	330.9105	459.7776	586.4493	777.9032	1357.5000	1871.6980	2187.9410	3535.2590
9+	642.3566	772.5728	844.9107	962.8043	1145.4510	1517.0030	1912.5780	2151.9180	3146.7480

2022

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2	1122.0950	1745.8170	2496.1190	3217.7300	4285.5670	7478.6080	10129.3900	11978.3200	19826.1800
3	907.7031	1466.8820	2053.4650	2624.2580	3472.8015	5965.7690	8162.6660	9766.0380	15893.5400
4	722.5143	1183.7110	1661.0710	2095.0130	2790.4765	4797.5880	6500.2480	7783.9600	12842.6600
5	539.8292	909.4674	1249.3740	1579.6420	2107.5500	3660.2110	4886.3420	5877.4360	9484.5080
6	396.4355	624.9748	893.7929	1142.2610	1513.0145	2617.6950	3489.2880	4248.6460	6901.8430
7	282.3152	435.5614	630.5441	819.5519	1088.4860	1882.9780	2540.7810	3059.5500	5268.0820
8	203.8908	320.1367	462.5437	586.2388	777.8717	1370.1540	1838.4360	2183.6570	3652.0590
9+	819.0344	962.6415	1052.5290	1227.4600	1548.6070	1956.9100	2414.6200	2792.9540	3574.9240

2023

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2	1117.1360	1806.0780	2552.7390	3218.3690	4286.9890	7499.5600	10155.9400	11998.0200	19918.7900
3	914.9950	1423.6360	2035.3120	2623.7840	3494.5420	6098.2760	8259.7820	9767.6200	16166.9100
4	724.3465	1170.5540	1638.7150	2094.1550	2771.2765	4760.6900	6513.7770	7793.0330	12682.8900
5	544.7678	892.5291	1252.4560	1579.6570	2104.0380	3617.5190	4901.3330	5868.9660	9683.3850
6	390.8747	658.5197	904.6899	1143.7760	1526.0155	2650.3490	3538.0910	4255.8390	6867.7370
7	284.3454	448.2645	641.1104	819.3222	1085.2335	1877.5420	2502.7720	3047.4440	4950.4200
8	201.9511	311.5694	451.0427	586.2537	778.6482	1346.9920	1817.5090	2188.6270	3768.5410
9+	954.3702	1132.6320	1228.7720	1467.7070	1819.3875	2261.2220	2763.1320	3134.0690	3926.0200

2024

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2	1132.2230	1814.5720	2562.1120	3217.0910	4300.4750	7489.8460	10119.1400	12000.8200	20241.7400
3	910.9620	1472.7320	2081.5520	2624.3320	3495.7625	6115.2360	8281.0480	9783.7310	16242.4700
4	730.1470	1136.0870	1624.1820	2093.7560	2788.6430	4866.4010	6591.1230	7794.3790	12901.2900

5	546.1708	882.6226	1235.6340	1579.0210	2089.6065	3589.4960	4911.4410	5875.8230
9562.9530								
6	394.4643	646.2357	906.8787	1143.7910	1523.4715	2619.3190	3548.9320	4249.6220
7011.9480								
7	280.3581	472.3332	648.9195	820.3935	1094.5570	1900.9560	2537.7190	3052.6620
4926.0240								
8	203.4054	320.6577	458.6080	586.0834	776.3060	1343.0700	1790.3670	2179.9810
3541.2940								
9+	1065.1520	1254.1460	1378.2470	1637.7420	2010.6545	2462.9880	2994.4390	3374.7030
4187.9230								

2025

Age	1%	5%	10%	25%	50%	75%	90%	95%
99%								
1	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500
25080.2100								
2	1135.8140	1801.6740	2589.7970	3220.9010	4293.0390	7490.7490	10050.5500	11938.5000
19692.4400								
3	923.2274	1479.6400	2089.1810	2623.3180	3506.6925	6107.5390	8251.3360	9785.7750
16505.0000								
4	726.9456	1175.2590	1661.0460	2094.2070	2789.6015	4879.9800	6608.3560	7807.5200
12961.7600								
5	550.5285	856.6219	1224.6630	1578.7160	2102.6240	3669.4170	4969.7610	5877.0090
9727.6770								
6	395.4846	639.0430	894.6831	1143.3120	1513.0245	2599.0220	3556.2970	4254.6180
6924.3350								
7	282.9370	463.5243	650.4861	820.4137	1092.7505	1878.8140	2545.5600	3047.9630
5029.4130								
8	200.5556	337.8791	464.1910	586.8608	782.9774	1359.8330	1815.2730	2183.7390
3523.7750								
9+	1163.7920	1369.2140	1504.9750	1764.4130	2142.8155	2614.0310	3108.0080	3489.2970
4294.4580								

2026

Age	1%	5%	10%	25%	50%	75%	90%	95%
99%								
1	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800
23778.2800								
2	1098.9910	1759.9650	2496.4440	3218.9080	4318.4955	7605.9580	10246.9400	12111.4800
20506.6100								
3	926.1603	1469.1060	2111.7380	2626.4200	3500.5540	6108.1170	8195.7400	9734.3520
16057.9000								
4	736.7365	1180.7020	1667.1500	2093.3880	2798.3635	4873.6630	6584.5210	7808.8900
13170.9200								
5	548.1240	886.1283	1252.4160	1579.0510	2103.4375	3679.4300	4982.7430	5886.9260
9773.3310								
6	398.6278	620.2747	886.7408	1143.1060	1522.4365	2656.9830	3598.7080	4255.4440
7044.0200								
7	283.6747	458.3567	641.7349	820.0606	1085.2510	1864.2060	2550.8310	3051.7570
4966.4960								
8	202.3875	331.5747	465.3211	586.8867	781.6811	1344.0040	1820.9740	2180.3610
3597.7070								
9+	1250.9680	1459.6420	1599.1270	1871.8500	2248.6605	2710.9390	3215.9130	3602.8370
4312.1350								

2027

Age	1%	5%	10%	25%	50%	75%	90%	95%
99%								
1	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200
24428.4200								
2	1120.4060	1814.8520	2521.6880	3216.8550	4277.0545	7400.3330	9929.0040	11966.3800
19441.2200								
3	896.1530	1435.0920	2035.6250	2624.7770	3521.4825	6202.0110	8355.5180	9876.1740
16721.1500								
4	739.0653	1172.3700	1685.1480	2095.8360	2793.4650	4874.1530	6539.8980	7768.1750
12814.2200								
5	555.5100	890.2794	1257.0870	1578.4320	2109.9475	3674.8660	4964.6430	5888.1620
9931.0640								

6	396.8872	641.6004	906.8340	1143.3280	1523.0570	2664.2110	3607.9050	4262.6050	7076.6060
7	285.9303	444.9133	636.0009	819.9162	1091.9740	1905.7540	2581.1770	3052.3190	5052.3570
8	202.9252	327.8861	459.0761	586.6375	776.3278	1333.5410	1824.6850	2183.1130	3552.7040
9+	1323.7890	1534.8130	1668.3220	1936.4880	2313.4830	2777.5760	3298.1110	3651.9940	4333.0150

2028

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2	1122.3550	1777.0520	2507.1660	3218.4690	4294.7995	7445.5530	10207.0900	11931.5200	19973.1800
3	913.6154	1479.8940	2056.3010	2623.1170	3487.6545	6034.2250	8096.5010	9757.5090	15852.4500
4	715.1183	1145.2260	1624.4070	2094.5900	2810.1935	4949.2860	6667.6650	7881.1290	13343.9300
5	557.2712	883.9569	1270.6200	1580.2900	2106.3065	3675.2150	4931.1400	5857.3480	9662.3150
6	402.2155	644.6363	910.2400	1142.9580	1527.8020	2660.8500	3594.6890	4263.4810	7190.8020
7	284.6822	460.1916	650.4455	820.0928	1092.4640	1910.9580	2587.7370	3057.3940	5075.7810
8	204.5337	318.2569	454.9625	586.5204	781.1341	1363.1900	1846.4230	2183.4810	3614.1300
9+	1336.5380	1567.8160	1709.9380	1982.5340	2367.6785	2819.3520	3325.3000	3670.9450	4461.6250

2029

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2	1146.9520	1825.8780	2533.1740	3216.0540	4273.1920	7436.8880	9982.7790	12020.5300	20087.0900
3	915.1834	1449.0300	2044.4310	2624.3870	3502.0805	6071.2660	8323.0760	9729.7040	16286.4600
4	729.0603	1180.9470	1640.9330	2093.2210	2783.1265	4815.3150	6460.9950	7786.1430	12650.3900
5	539.2058	863.5367	1224.8510	1579.3430	2118.8795	3731.7980	5027.4520	5942.4630	10061.1600
6	403.5078	640.0272	920.0044	1144.2550	1525.1530	2661.1810	3570.5820	4241.1460	6996.3680
7	288.4917	462.3770	652.8683	819.8329	1095.8280	1908.6070	2578.3970	3058.1590	5157.6910
8	203.6445	329.1968	465.2836	586.6442	781.4661	1366.9710	1851.1640	2187.0620	3630.9690
9+	1377.6510	1591.6090	1740.0590	2020.6750	2408.6710	2861.2460	3360.1900	3725.1750	4560.8340

2030

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600
2	1124.7080	1841.7020	2554.3980	3218.6290	4288.7635	7612.1460	10195.3400	12087.5800	20333.3600
3	935.2335	1488.8820	2065.5470	2622.4250	3484.4485	6064.3130	8140.2000	9801.7930	16379.3900
4	730.3032	1156.3430	1631.4780	2094.2830	2794.6895	4844.8300	6641.6250	7764.2580	12996.6700
5	549.7191	890.4454	1237.3120	1578.3320	2098.4885	3630.8150	4871.6050	5870.8170	9538.4670
6	390.4187	625.2924	886.8581	1143.5690	1534.2755	2702.0540	3640.3260	4302.7940	7284.9630

7 289.4232 459.0681 659.9237 820.7497 1093.9710 1908.8080 2561.0230 3042.0550
5018.1650
8 206.3692 330.7607 467.0243 586.4444 783.9130 1365.2560 1844.4530 2187.6730
3689.6090
9+ 1414.2760 1622.6910 1763.3110 2053.4220 2432.0625 2893.6350 3409.2790 3769.1420
4555.7420

Requested Percentile Report

Percentile = 90.00 %

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Recruits	12417.3800	12558.8100	12336.3400	12195.0400	12012.8400	12179.7600	12217.6500	12242.8800	12388.5500	12421.2300	12376.0000	12291.8500	12532.5100	12143.3200	12483.8100	12208.9400	12469.8800	12089.6900	11930.1300
Spawning Stock Biomass	11.9738	12.2816	15.3401	21.0415	29.9423	39.3578	47.1592	53.0497	59.6956	67.3024	72.0561	75.3589	77.8568	79.5157	80.8350	82.0011	82.6142	83.1519	83.6105
Jan-1 Stock Biomass	16.4055	16.5899	22.1197	30.5988	41.2802	51.7082	59.5691	65.8662	72.8714	81.0644	86.3035	90.0687	92.8440	94.4231	96.0991	97.0861	97.9042	98.3078	98.8398
Mean Biomass	18.1084	20.7160	28.6066	39.9860	51.8779	61.8975	69.3529	75.5383	81.8200	88.2957	92.6187	95.9675	98.2835	99.8975	101.1864	102.1199	102.8297	103.2268	103.3099
Combined Catch Biomass	4.8910	1.6360	1.9409	2.5096	3.6799	5.0384	6.1985	7.1323	8.0580	8.9377	9.5293	9.9358	10.2267	10.4525	10.6277	10.7533	10.8470	10.9337	10.9733
Landings	4.8910	1.6360	1.9409	2.5096	3.6799	5.0384	6.1985	7.1323	8.0580	8.9377	9.5293	9.9358	10.2267	10.4525	10.6277	10.7533	10.8470	10.9337	10.9733
FMort	0.9816	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350

Stock Numbers at Age

Age 1	4083.9300	12417.3800	12558.8100	12336.3400	12195.0400	12012.8400	12179.7600	12217.6500	12242.8800	12388.5500	12421.2300	12376.0000	12291.8500	12532.5100	12143.3200	12483.8100	12208.9400	12469.8800	12089.6900
Age 2	1707.4100	3328.7360	10152.7000	10268.2700	10086.6300	9971.1160	9821.9490	9958.5980	9989.3370	10010.1000	10129.3900	10155.9400	10119.1400	10050.5500	10246.9400	9929.0040	10207.0900	9982.7790	10195.3400
Age 3	2111.8400	1373.0960	2714.4070	8278.1560	8373.2590	8224.9560	8130.7350	8008.8830	8120.6390	8145.3940	8162.6660	8259.7820	8281.0480	8251.3360	8195.7400	8355.5180	8096.5010	8323.0760	8140.2000
Age 4	2088.9300	1563.0700	1095.7540	2166.1010	6605.8870	6681.9280	6563.2140	6488.2460	6391.0380	6480.4340	6500.2480	6513.7770	6591.1230	6608.3560	6584.5210	6539.8980	6667.6650	6460.9950	6641.6250
Age 5	1357.4100	1282.0810	1178.5650	826.2097	1633.2570	4980.8150	5038.2250	4948.5970	4892.1270	4818.9570	4886.3420	4901.3330	4911.4410	4969.7610	4982.7430	4964.6430	4931.1400	5027.4520	4871.6050
Age 6	637.8940	729.7777	928.3032	853.3691	598.2402	1182.6160	3606.4860	3647.9490	3583.1550	3542.3160	3489.2880	3538.0910	3548.9320	3556.2970	3598.7080	3607.9050	3594.6890	3570.5820	3640.3260
Age 7	283.2270	334.0343	523.4402	665.8448	612.1022	429.1105	848.2853	2586.8190	2616.5300	2570.0800	2540.7810	2502.7720	2537.7190	2545.5600	2550.8310	2581.1770	2587.7370	2578.3970	2561.0230
Age 8	61.3528	143.8921	238.9498	374.4498	476.3042	437.8615	306.9698	606.8184	1850.4120	1871.6980	1838.4360	1817.5090	1790.3670	1815.2730	1820.9740	1824.6850	1846.4230	1851.1640	1844.4530
Age 9	47.8801	55.4956	142.8169	272.9293	457.2151	656.0730	746.6312	709.9610	934.0419	1912.5780	2414.6200	2763.1320	2994.4390	3108.0080	3215.9130	3298.1110	3325.3000	3360.1900	3409.2790

Scenario 2 Projection
AGEPRO VERSION 4.2

SAW55_3BLOCK_BASE

Date & Time of Run: 01 Mar 2013 11:50

Input File Name:
D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\GOMCOD_SAW55_3BLOCK_BASE_SHORT_75FMSY_12CAT6030_SCENARIO2.INP

First Age Class:	1
Number of Age Classes:	9
Number of Years in Projection:	19
Number of Fleets:	1
Number of Recruitment Models:	1
Number of Bootstraps:	1000
Number of Simulations:	10

Bootstrap File Name: D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\SAW55_3BLOCK_BASE_MCMC.BSN

Number of Feasible Solutions: 10000 of 10000 Realizations

Input Harvest Scenario

Year	Type	Value
2012	Landings	6030
2013	F-Mult	0.1350
2014	F-Mult	0.1350
2015	F-Mult	0.1350
2016	F-Mult	0.1350
2017	F-Mult	0.1350
2018	F-Mult	0.1350
2019	F-Mult	0.1350
2020	F-Mult	0.1350
2021	F-Mult	0.1350
2022	F-Mult	0.1350
2023	F-Mult	0.1350
2024	F-Mult	0.1350
2025	F-Mult	0.1350
2026	F-Mult	0.1350
2027	F-Mult	0.1350
2028	F-Mult	0.1350
2029	F-Mult	0.1350
2030	F-Mult	0.1350

Recruits 1000 Fish

Year Class	Average	StdDev
2012	6926.7937	4465.8077
2013	6923.5380	4386.4587
2014	6937.4571	4438.1684
2015	6919.2931	4527.0696
2016	6848.1821	4336.7865
2017	6927.8128	4327.1141
2018	6904.8750	4345.1040
2019	6853.8386	4341.3137
2020	6939.1845	4398.8850
2021	6952.5694	4402.3823
2022	6973.7562	4462.6114
2023	6932.3252	4365.9713
2024	7044.3441	4564.4314
2025	6897.3804	4358.1031
2026	6933.3608	4380.3428
2027	6924.7521	4452.7725
2028	7017.1113	4540.7667
2029	6852.1367	4397.8307
2030	6883.5775	4300.2626

Recruits Distribution

Year Class	1%	5%	10%	25%	50%	75%	90%	95%	99%

2012	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2013	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2014	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2015	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2016	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2017	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2018	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2019	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2020	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2021	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2022	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2023	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2024	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2025	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2026	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2027	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2028	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2029	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600
2030	1347.1080	2222.8420	3135.0670	3934.5510	5235.3460	9103.0150	11930.1300	14588.2800	23922.8900

Spawning Stock Biomass x 1000 MT

Year	Average	StdDev
2012	8.5640	2.3536
2013	7.8225	2.6923
2014	10.5877	2.9055
2015	15.4170	3.5862
2016	22.1204	5.3651
2017	29.0859	7.1652
2018	35.0448	8.3673
2019	40.1165	9.2310
2020	46.0021	9.9430
2021	52.0206	11.2040
2022	56.3185	11.7406
2023	59.3966	12.0087
2024	61.6140	12.1823
2025	63.2132	12.2105
2026	64.4191	12.2510
2027	65.2907	12.3115
2028	65.9045	12.4036
2029	66.3703	12.4648
2030	66.6937	12.5129

Spawning Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	3.6085	4.9948	5.6017	6.9604	8.3790	9.9515	11.6725	12.7818	14.8222
2013	2.5216	3.8378	4.4998	5.9380	7.5328	9.3940	11.3256	12.5888	15.1174

2014	4.8291	6.2803	7.0755	8.5567	10.3025	12.2793	14.4005	15.8622	18.4630
2015	8.4653	10.2297	11.1763	12.9365	15.0052	17.5343	20.1319	22.0055	25.7332
2016	12.7587	14.8635	16.0669	18.3878	21.3780	25.0230	29.0548	32.0435	38.8642
2017	16.9531	19.4637	21.0531	23.9401	28.0290	32.9066	38.5566	42.7506	50.5512
2018	20.8305	23.5680	25.4922	29.0254	33.7993	39.5835	46.5508	50.7370	59.6009
2019	24.0051	27.3592	29.3823	33.5269	38.8117	45.5044	52.6069	57.1670	66.9824
2020	28.2616	32.0967	34.3699	38.8580	44.6790	51.8497	59.3474	64.2934	74.6889
2021	31.8802	36.1257	38.8849	43.9918	50.6235	58.6342	67.0697	72.6453	83.7951
2022	34.5425	39.2401	42.3168	47.8969	55.0095	63.4076	71.8890	77.4701	89.2317
2023	36.9124	41.8220	45.0147	50.8181	58.1365	66.6541	75.2281	81.0620	92.7135
2024	38.3317	43.7107	47.0822	52.9140	60.4850	68.9549	77.7721	83.5672	95.9500
2025	39.8569	45.1258	48.4285	54.4781	62.0972	70.5428	79.4562	85.0039	96.7569
2026	40.8249	46.3070	49.6249	55.7026	63.3713	71.9844	80.7948	86.4850	97.3496
2027	41.7751	47.2075	50.3812	56.4270	64.0961	72.8923	81.9727	87.4462	98.3577
2028	42.3741	47.6764	51.0155	56.9479	64.6628	73.4066	82.5912	88.1586	99.3016
2029	43.1210	47.9752	51.3036	57.3461	65.1639	74.0613	83.1331	88.7976	100.4976
2030	43.2116	48.3344	51.6533	57.5770	65.4089	74.4092	83.5996	89.1445	100.3467

JAN-1 Stock Biomass x 1000 MT

Year	Average	StdDev
2012	12.8419	2.7428
2013	11.3213	3.2320
2014	16.0376	3.7966
2015	22.7263	5.2777
2016	30.7013	7.3382
2017	38.4758	9.1400
2018	44.9705	10.2980
2019	50.4820	11.0978
2020	56.8826	11.7580
2021	63.4228	13.0251
2022	68.1076	13.5784
2023	71.4801	13.8754
2024	73.9095	14.0701
2025	75.6617	14.0981
2026	76.9835	14.1426
2027	77.9208	14.2312
2028	78.5670	14.3388
2029	79.0737	14.3853
2030	79.4318	14.4249

JAN-1 Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	7.2801	8.7308	9.4238	10.9381	12.5757	14.4349	16.4055	17.7124	20.3350
2013	4.8967	6.5163	7.3977	9.0636	11.0303	13.1948	15.5239	17.1805	20.0307
2014	8.5613	10.4295	11.4916	13.3846	15.6533	18.3547	21.0962	22.9274	26.3651
2015	13.2392	15.3875	16.6768	19.0545	22.0509	25.6309	29.6147	32.3730	38.7952

2016	18.0757	20.7606	22.4057	25.5059	29.6626	34.5787	40.3006	44.6032	53.0230
2017	22.9061	25.9605	28.0581	31.9192	37.2084	43.4001	50.8472	55.7464	65.8283
2018	27.1478	30.7725	33.0423	37.5793	43.5225	50.8881	58.8928	64.0697	74.8969
2019	30.7460	34.9181	37.5047	42.4879	49.0374	57.0298	65.3780	70.7756	83.0361
2020	35.6770	40.1311	43.0479	48.5181	55.4338	63.8989	72.5186	78.5956	90.0711
2021	39.3631	44.7038	47.9574	54.1325	61.9556	71.2404	80.8081	87.3904	99.4976
2022	42.5106	48.2427	51.9104	58.3719	66.7006	76.3553	86.1302	92.3668	105.7738
2023	45.0502	51.0772	54.8748	61.6222	70.0992	79.9395	89.9409	96.2101	110.1156
2024	46.7159	53.1307	56.9234	63.9070	72.6867	82.3653	92.7544	98.9369	113.2973
2025	48.5737	54.6415	58.5679	65.5884	74.3504	84.3414	94.3532	101.0908	114.0282
2026	49.4385	56.1241	59.8449	66.9161	75.7218	85.8280	96.0533	102.3080	114.4638
2027	50.5835	57.0158	60.7258	67.7501	76.5900	86.7393	97.0512	103.4467	115.5719
2028	51.3776	57.2879	61.2278	68.3443	77.1305	87.3385	97.8812	104.1995	117.3641
2029	52.0297	57.7713	61.6819	68.6839	77.7460	87.9782	98.2907	104.8754	118.3366
2030	51.7791	58.1828	62.0356	68.9579	78.0936	88.4711	98.8265	105.2046	117.7071

Mean Biomass x 1000 MT

Year	Average	StdDev
2012	13.0117	3.4171
2013	14.7196	3.7150
2014	21.2220	4.8889
2015	29.6568	7.2383
2016	38.3288	9.5295
2017	45.9916	11.0765
2018	52.4397	12.0808
2019	58.0006	12.7718
2020	63.8244	13.2783
2021	69.3775	14.0710
2022	73.3582	14.4479
2023	76.2470	14.6741
2024	78.3434	14.8262
2025	79.8691	14.8682
2026	81.0023	14.9295
2027	81.8048	15.0362
2028	82.3451	15.1311
2029	82.7681	15.1450
2030	83.0702	15.1699

Mean Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	5.9545	7.8487	8.7635	10.6741	12.6785	14.9925	17.4804	18.9788	21.9651
2013	7.2265	9.1739	10.2464	12.0988	14.3853	16.9989	19.6206	21.4272	24.6110
2014	12.0737	14.3151	15.5533	17.8355	20.6130	23.9427	27.6101	30.1007	35.7006
2015	17.2825	20.1148	21.5682	24.5845	28.5896	33.4296	39.0530	43.2933	52.4361
2016	22.4277	25.5246	27.6171	31.5007	36.9017	43.3635	51.0098	56.5475	66.8437
2017	26.9559	30.7949	33.2760	38.0129	44.3354	52.1419	61.1463	66.7308	78.7151

2018	31.3030	35.7196	38.3832	43.8432	50.8204	59.5075	68.7795	74.7028	87.7649
2019	35.0505	39.9884	42.9915	48.8199	56.3790	65.6107	75.1298	81.5489	94.6908
2020	39.6243	44.7394	48.0755	54.3645	62.2086	71.8752	81.5148	88.4427	101.0263
2021	42.9377	48.8936	52.6185	59.3503	67.8548	77.9892	88.0690	94.9862	108.4274
2022	45.8770	52.1352	56.0742	63.0699	71.9795	82.1878	92.4548	99.0543	113.0595
2023	47.9607	54.5327	58.5886	65.7933	74.8338	85.0095	95.8568	102.2635	116.9608
2024	49.8974	56.4008	60.3323	67.7252	76.9951	87.3519	98.1970	104.9402	118.3446
2025	51.0642	57.8302	61.8446	69.3301	78.5824	89.0900	99.8396	106.5215	120.0260
2026	51.9946	59.1505	62.9296	70.3408	79.5803	90.2847	101.1452	107.6405	120.8941
2027	53.2101	59.6699	63.6467	71.0254	80.2431	90.9470	102.0921	108.7361	122.2038
2028	54.0349	60.0718	64.0345	71.4534	80.8117	91.6479	102.8094	109.7439	123.1579
2029	53.9074	60.4457	64.3958	71.8192	81.3791	92.2306	103.2124	109.9058	123.6802
2030	54.1189	60.8912	64.8298	72.0938	81.7403	92.4557	103.2998	110.1368	123.2722

Combined Catch Biomass x 1000 MT

Year	Average	StdDev
2012	6.0300	0.0000
2013	1.0107	0.3738
2014	1.2835	0.4028
2015	1.8187	0.4287
2016	2.7177	0.6622
2017	3.6982	0.9541
2018	4.5647	1.1454
2019	5.3192	1.2937
2020	6.1043	1.4049
2021	6.8541	1.5428
2022	7.3902	1.5988
2023	7.7704	1.6260
2024	8.0456	1.6434
2025	8.2463	1.6485
2026	8.3974	1.6571
2027	8.5064	1.6653
2028	8.5882	1.6753
2029	8.6471	1.6854
2030	8.6855	1.6920

Combined Catch Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300
2013	0.2715	0.4576	0.5424	0.7473	0.9793	1.2381	1.4997	1.6670	2.0219
2014	0.4913	0.6916	0.7876	1.0086	1.2396	1.5198	1.8076	2.0096	2.3669
2015	0.9536	1.1811	1.3036	1.5173	1.7812	2.0853	2.3842	2.5863	2.9776
2016	1.5556	1.8278	1.9786	2.2607	2.6218	3.0706	3.5650	3.9403	4.8152
2017	2.1217	2.4531	2.6362	3.0205	3.5487	4.1847	4.9344	5.5308	6.7064
2018	2.6612	3.0236	3.2677	3.7443	4.3942	5.1739	6.1189	6.7413	7.9939
2019	3.0995	3.5491	3.8259	4.3906	5.1295	6.0584	7.0745	7.7340	9.0832

2020	3.6474	4.1509	4.4702	5.1007	5.9151	6.9238	8.0180	8.6776	10.2105
2021	4.0913	4.6673	5.0550	5.7494	6.6460	7.7709	8.9071	9.7108	11.2668
2022	4.4589	5.0850	5.4915	6.2484	7.2067	8.3563	9.5062	10.3021	11.8319
2023	4.7379	5.4101	5.8342	6.6031	7.5903	8.7548	9.9211	10.6946	12.2990
2024	4.9425	5.6553	6.0891	6.8744	7.8716	9.0356	10.2162	11.0100	12.6237
2025	5.1209	5.8296	6.2525	7.0651	8.0991	9.2333	10.4445	11.2028	12.7629
2026	5.2535	5.9362	6.4008	7.2141	8.2371	9.4158	10.6223	11.3937	12.9345
2027	5.3850	6.0658	6.5015	7.3092	8.3403	9.5223	10.7491	11.5038	12.9682
2028	5.4449	6.1497	6.5988	7.3824	8.4099	9.6019	10.8442	11.6090	13.1457
2029	5.5144	6.1770	6.6262	7.4282	8.4804	9.6621	10.9317	11.7008	13.2380
2030	5.5410	6.2227	6.6494	7.4577	8.5086	9.7403	10.9720	11.7214	13.2956

Landings x 1000 MT

Year	Average	StdDev
2012	6.0300	0.0000
2013	1.0107	0.3738
2014	1.2835	0.4028
2015	1.8187	0.4287
2016	2.7177	0.6622
2017	3.6982	0.9541
2018	4.5647	1.1454
2019	5.3192	1.2937
2020	6.1043	1.4049
2021	6.8541	1.5428
2022	7.3902	1.5988
2023	7.7704	1.6260
2024	8.0456	1.6434
2025	8.2463	1.6485
2026	8.3974	1.6571
2027	8.5064	1.6653
2028	8.5882	1.6753
2029	8.6471	1.6854
2030	8.6855	1.6920

Landings Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300	6.0300
2013	0.2715	0.4576	0.5424	0.7473	0.9793	1.2381	1.4997	1.6670	2.0219
2014	0.4913	0.6916	0.7876	1.0086	1.2396	1.5198	1.8076	2.0096	2.3669
2015	0.9536	1.1811	1.3036	1.5173	1.7812	2.0853	2.3842	2.5863	2.9776
2016	1.5556	1.8278	1.9786	2.2607	2.6218	3.0706	3.5650	3.9403	4.8152
2017	2.1217	2.4531	2.6362	3.0205	3.5487	4.1847	4.9344	5.5308	6.7064
2018	2.6612	3.0236	3.2677	3.7443	4.3942	5.1739	6.1189	6.7413	7.9939
2019	3.0995	3.5491	3.8259	4.3906	5.1295	6.0584	7.0745	7.7340	9.0832
2020	3.6474	4.1509	4.4702	5.1007	5.9151	6.9238	8.0180	8.6776	10.2105
2021	4.0913	4.6673	5.0550	5.7494	6.6460	7.7709	8.9071	9.7108	11.2668

2022	4.4589	5.0850	5.4915	6.2484	7.2067	8.3563	9.5062	10.3021
11.8319								
2023	4.7379	5.4101	5.8342	6.6031	7.5903	8.7548	9.9211	10.6946
12.2990								
2024	4.9425	5.6553	6.0891	6.8744	7.8716	9.0356	10.2162	11.0100
12.6237								
2025	5.1209	5.8296	6.2525	7.0651	8.0991	9.2333	10.4445	11.2028
12.7629								
2026	5.2535	5.9362	6.4008	7.2141	8.2371	9.4158	10.6223	11.3937
12.9345								
2027	5.3850	6.0658	6.5015	7.3092	8.3403	9.5223	10.7491	11.5038
12.9682								
2028	5.4449	6.1497	6.5988	7.3824	8.4099	9.6019	10.8442	11.6090
13.1457								
2029	5.5144	6.1770	6.6262	7.4282	8.4804	9.6621	10.9317	11.7008
13.2380								
2030	5.5410	6.2227	6.6494	7.4577	8.5086	9.7403	10.9720	11.7214
13.2956								

Total Fishing Mortality

Year	Average	StdDev
2012	0.9155	0.3515
2013	0.1350	0.0000
2014	0.1350	0.0000
2015	0.1350	0.0000
2016	0.1350	0.0000
2017	0.1350	0.0000
2018	0.1350	0.0000
2019	0.1350	0.0000
2020	0.1350	0.0000
2021	0.1350	0.0000
2022	0.1350	0.0000
2023	0.1350	0.0000
2024	0.1350	0.0000
2025	0.1350	0.0000
2026	0.1350	0.0000
2027	0.1350	0.0000
2028	0.1350	0.0000
2029	0.1350	0.0000
2030	0.1350	0.0000

Total Fishing Mortality Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%
99%								
2012	0.4368	0.5220	0.5774	0.6836	0.8391	1.0511	1.3624	1.5774
2.1800								
2013	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2014	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2015	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2016	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2017	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2018	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2019	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2020	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2021	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2022	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2023	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								

2024	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2025	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2026	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2027	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2028	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2029	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2030	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350

JAN-1 Stock Numbers at Age - 1000 Fish

2012

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	3470.7100	3582.0200	3630.7900	3733.1100	3845.4000	3970.9800	4083.9300	4158.3900	4317.7200
2	238.3360	346.6600	439.6270	636.1570	927.1550	1288.8100	1707.4100	2053.8300	2637.8900
3	628.9300	792.3810	889.8900	1098.6100	1389.0900	1699.8800	2111.8400	2331.2900	2895.3200
4	924.0740	1046.1800	1143.1600	1345.3900	1586.0550	1844.7200	2088.9300	2260.2700	2689.6800
5	541.8520	638.9290	722.4190	836.8020	993.8315	1180.0600	1357.4100	1491.0000	1750.6100
6	205.2150	265.2180	300.2310	360.2070	439.7105	535.3540	637.8940	691.6980	865.0120
7	82.4731	99.1877	117.2230	146.9100	185.1170	230.8150	283.2270	314.3510	388.2850
8	13.6543	18.2450	21.2075	27.9255	37.2013	48.9121	61.3528	70.3407	89.6368
9+	8.5168	11.6466	14.5945	19.3767	26.8609	36.7221	47.8801	56.9625	73.2486

2013

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2	2785.8660	2890.2660	2932.5970	3025.6630	3121.2060	3227.2890	3324.6740	3385.3720	3516.6330
3	184.5643	277.0703	352.2447	507.4327	738.4679	1025.3230	1365.7460	1635.0430	2116.7650
4	390.3950	502.7136	590.2761	748.2424	957.5693	1193.4050	1507.7990	1679.8940	2081.7780
5	192.7917	345.0017	427.1829	589.1480	779.0884	968.1386	1182.4960	1300.3890	1618.5290
6	57.6458	129.0997	176.6307	262.5188	378.9607	511.1672	652.0553	748.6684	932.4765
7	20.6916	45.6898	64.2374	106.0032	158.7828	219.4855	293.7948	331.9586	434.7196
8	8.0995	17.7509	25.1088	43.2548	65.8627	92.2074	125.8059	152.0772	202.6349
9+	2.4238	5.7553	7.6503	14.2282	22.6527	33.4936	48.1659	57.6618	81.9959

2014

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2	1137.4290	1779.8250	2548.8050	3216.7850	4272.0765	7356.3970	10152.7000	12039.0400	20068.7800

3	2271.6610	2356.8300	2391.3440	2467.2260	2545.0460	2631.6070	2711.0950	2760.5540	2867.5550
4	147.2816	221.1040	281.0958	404.9367	589.3053	818.2095	1089.9100	1304.7730	1689.1760
5	294.3642	379.0479	445.0770	564.1856	721.9982	899.8306	1136.9180	1266.6960	1569.7160
6	139.5954	249.8145	309.3156	426.6116	564.1193	701.0002	856.2113	941.5729	1171.9420
7	41.3463	92.6015	126.6944	188.2940	271.8142	366.6519	467.6931	536.9931	668.8257
8	14.8018	32.6849	45.9517	75.8276	113.5873	157.0055	210.1639	237.4641	310.9730
9+	7.7157	16.9655	23.3902	40.9673	63.6222	90.0841	125.2263	151.0995	203.5884

2015

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2	1127.1350	1815.4210	2522.3270	3217.2680	4267.5945	7447.0390	10268.2700	12002.2300	19392.9500
3	927.4998	1451.2620	2078.4230	2623.0000	3483.5215	5998.6630	8278.1560	9817.0450	16363.8300
4	1812.8030	1880.6870	1908.2770	1968.8550	2031.0045	2100.0580	2163.4570	2202.9440	2288.3770
5	111.0541	166.7151	211.9526	305.3253	444.3437	616.9401	821.7846	983.8224	1273.6800
6	213.1494	274.4605	322.2686	408.5227	522.7890	651.5488	823.2156	917.2206	1136.5910
7	100.1291	179.1805	221.8587	305.9912	404.6273	502.8089	614.1483	675.3185	840.5837
8	29.5774	66.2417	90.6288	134.7007	194.4364	262.2712	334.5703	384.1390	478.4488
9+	16.2259	35.4807	49.6928	84.2509	126.8829	174.9071	240.0716	274.1582	376.4160

2016

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2	1118.5380	1756.2910	2537.4690	3216.1820	4267.5195	7516.9450	10086.6300	11980.7700	20034.5600
3	919.0880	1480.2840	2056.7610	2623.4060	3479.8840	6072.5310	8373.2590	9787.0510	15813.1400
4	740.1478	1158.0960	1658.6070	2093.1400	2779.8275	4787.0090	6605.8870	7834.0910	13058.5900
5	1366.9130	1418.0800	1438.8970	1484.4860	1531.3885	1583.4870	1631.2630	1661.0240	1725.4440
6	80.4125	120.7159	153.4706	221.0808	321.7445	446.7176	595.0275	712.3687	922.2499
7	152.8827	196.8629	231.1544	293.0242	374.9744	467.3499	590.4597	657.8714	815.2654
8	71.6252	128.1785	158.7024	218.8939	289.4545	359.6934	439.3279	483.0974	601.3019
9+	32.7176	72.8319	100.9860	160.2657	230.2050	317.5672	403.6189	471.3065	607.5493

2017

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2	1107.8540	1709.4190	2474.4290	3216.2170	4271.8110	7389.9540	9971.1160	12007.5700	20674.5000
3	912.0705	1432.1380	2069.1420	2622.5340	3479.7460	6129.5450	8224.9560	9769.4530	16336.4700

4	733.4144	1181.2650	1641.3140	2093.4530	2776.8990	4845.9020	6681.9280	7809.8560	12619.1600
5	558.1019	873.2225	1250.5980	1578.2670	2096.0060	3609.5080	4980.8150	5906.8700	9846.3210
6	989.7515	1026.8250	1041.8880	1074.8830	1108.8355	1146.6110	1181.1730	1202.7780	1249.3640
7	57.6788	86.5858	110.0800	158.5760	230.7734	320.4155	426.7898	510.9551	661.5289
8	109.3651	140.8244	165.3569	209.6221	268.2373	334.3195	422.4051	470.5876	583.2011
9+	74.2283	147.3774	187.9992	276.7264	376.3623	478.5775	592.8047	665.9146	820.8672

2018

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2	1115.9240	1759.1660	2515.9590	3215.3770	4258.9025	7368.5480	9821.9490	11959.8700	19428.6500
3	903.3702	1393.9150	2017.7090	2622.5540	3483.3230	6025.9050	8130.7350	9791.2270	16858.1700
4	727.8383	1142.8350	1651.2240	2092.7840	2776.8795	4891.4610	6563.2140	7795.9790	13037.0400
5	553.0019	890.6967	1237.5440	1578.4800	2093.7790	3653.8520	5038.2250	5888.7940	9515.1940
6	404.0864	632.2822	905.5343	1142.8020	1517.7015	2613.6220	3606.4860	4277.0250	7129.6010
7	709.9428	736.5150	747.3233	771.0147	795.3470	822.4544	847.2475	862.6988	896.1484
8	41.2601	61.9392	78.7454	113.4395	165.0804	229.2112	305.2989	365.5102	473.2154
9+	151.2722	232.5793	271.6639	362.0256	470.8767	577.1946	695.4741	772.7332	924.9770

2019

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2	1100.2330	1853.7570	2546.4220	3219.5910	4295.6000	7460.3590	9958.5980	11978.3500	19331.8100
3	909.9492	1434.4700	2051.4950	2621.8620	3472.7550	6008.5690	8008.8830	9752.1880	15841.6400
4	720.8946	1112.3320	1610.1070	2092.8270	2779.6765	4808.5690	6488.2460	7813.2220	13452.9700
5	548.7850	861.7011	1245.0160	1577.9510	2093.7875	3688.2640	4948.5970	5878.0740	9829.8000
6	400.4097	644.9303	896.0754	1142.9560	1516.0855	2645.7210	3647.9490	4263.9800	6889.9040
7	289.8505	453.5339	649.5140	819.6927	1088.6110	1874.6280	2586.8190	3067.8090	5113.9750
8	507.8397	526.8697	534.5847	551.5381	568.9366	588.3252	606.0636	617.1365	641.0402
9+	167.9615	252.8870	288.7709	368.3816	456.0549	566.9209	670.6410	742.9395	907.9579

2020

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2	1110.3190	1819.1110	2552.7440	3219.6580	4288.2935	7373.3010	9989.3370	11961.9400	19735.8800
3	897.1829	1511.5700	2076.3240	2625.3310	3502.6825	6083.4420	8120.6390	9767.6120	15763.4300
4	726.1269	1144.7000	1637.0580	2092.2290	2771.2705	4794.8340	6391.0380	7782.1220	12641.6300

5	543.5649	838.6869	1214.0580	1578.0010	2095.8945	3625.7510	4892.1270	5891.3320	10143.4600
6	397.3667	623.9588	901.4730	1142.5420	1516.0840	2670.5180	3583.1550	4256.0880	7117.7840
7	287.1973	462.5921	642.7341	819.8184	1087.4505	1897.6700	2616.5300	3058.4810	4942.0150
8	207.3435	324.4391	464.6172	586.3600	778.7360	1341.0060	1850.4120	2194.5190	3658.2690
9+	498.8334	563.8046	599.5579	661.4438	735.6527	821.6244	906.9653	962.1893	1087.9310

2021

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2	1113.1630	1798.9530	2518.2430	3218.2750	4258.8600	7316.0820	10010.1000	11976.6700	19491.1200
3	905.4221	1483.3790	2081.5400	2625.3460	3496.8470	6012.0340	8145.3940	9754.2340	16092.9400
4	715.9504	1206.1900	1656.8960	2094.9840	2795.1080	4854.5570	6480.4340	7794.8400	12579.2700
5	547.5061	863.1365	1234.3780	1577.5440	2089.5550	3615.1990	4818.9570	5867.7190	9531.9450
6	393.5883	607.2635	879.0850	1142.5670	1517.5775	2625.2960	3542.3160	4265.6540	7344.6280
7	285.0155	447.5357	646.5931	819.5276	1087.4305	1915.3760	2570.0800	3052.6850	5105.4040
8	205.4528	330.9105	459.7776	586.4493	777.9032	1357.5000	1871.6980	2187.9410	3535.2590
9+	621.4924	751.1965	823.6085	942.1239	1124.7955	1496.7140	1892.6980	2132.3400	3125.8390

2022

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2	1122.0950	1745.8170	2496.1190	3217.7300	4285.5670	7478.6080	10129.3900	11978.3200	19826.1800
3	907.7031	1466.8820	2053.4650	2624.2580	3472.8015	5965.7690	8162.6660	9766.0380	15893.5400
4	722.5143	1183.7110	1661.0710	2095.0130	2790.4765	4797.5880	6500.2480	7783.9600	12842.6600
5	539.8292	909.4674	1249.3740	1579.6420	2107.5500	3660.2110	4886.3420	5877.4360	9484.5080
6	396.4355	624.9748	893.7929	1142.2610	1513.0145	2617.6950	3489.2880	4248.6460	6901.8430
7	282.3152	435.5614	630.5441	819.5519	1088.4860	1882.9780	2540.7810	3059.5500	5268.0820
8	203.8908	320.1367	462.5437	586.2388	777.8717	1370.1540	1838.4360	2183.6570	3652.0590
9+	804.1153	947.6711	1037.7670	1212.3980	1534.1270	1942.5310	2400.3890	2778.8260	3560.1580

2023

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2	1117.1360	1806.0780	2552.7390	3218.3690	4286.9890	7499.5600	10155.9400	11998.0200	19918.7900
3	914.9950	1423.6360	2035.3120	2623.7840	3494.5420	6098.2760	8259.7820	9767.6200	16166.9100
4	724.3465	1170.5540	1638.7150	2094.1550	2771.2765	4760.6900	6513.7770	7793.0330	12682.8900
5	544.7678	892.5291	1252.4560	1579.6570	2104.0380	3617.5190	4901.3330	5868.9660	9683.3850

6	390.8747	658.5197	904.6899	1143.7760	1526.0155	2650.3490	3538.0910	4255.8390	6867.7370
7	284.3454	448.2645	641.1104	819.3222	1085.2335	1877.5420	2502.7720	3047.4440	4950.4200
8	201.9511	311.5694	451.0427	586.2537	778.6482	1346.9920	1817.5090	2188.6270	3768.5410
9+	944.1783	1121.6860	1218.6060	1457.0310	1809.1905	2250.2750	2752.5820	3124.0040	3915.6830

2024

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2	1132.2230	1814.5720	2562.1120	3217.0910	4300.4750	7489.8460	10119.1400	12000.8200	20241.7400
3	910.9620	1472.7320	2081.5520	2624.3320	3495.7625	6115.2360	8281.0480	9783.7310	16242.4700
4	730.1470	1136.0870	1624.1820	2093.7560	2788.6430	4866.4010	6591.1230	7794.3790	12901.2900
5	546.1708	882.6226	1235.6340	1579.0210	2089.6065	3589.4960	4911.4410	5875.8230	9562.9530
6	394.4643	646.2357	906.8787	1143.7910	1523.4715	2619.3190	3548.9320	4249.6220	7011.9480
7	280.3581	472.3332	648.9195	820.3935	1094.5570	1900.9560	2537.7190	3052.6620	4926.0240
8	203.4054	320.6577	458.6080	586.0834	776.3060	1343.0700	1790.3670	2179.9810	3541.2940
9+	1057.7570	1246.5820	1369.7630	1630.3790	2003.1005	2455.2000	2986.8530	3366.7780	4179.7760

2025

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2	1135.8140	1801.6740	2589.7970	3220.9010	4293.0390	7490.7490	10050.5500	11938.5000	19692.4400
3	923.2274	1479.6400	2089.1810	2623.3180	3506.6925	6107.5390	8251.3360	9785.7750	16505.0000
4	726.9456	1175.2590	1661.0460	2094.2070	2789.6015	4879.9800	6608.3560	7807.5200	12961.7600
5	550.5285	856.6219	1224.6630	1578.7160	2102.6240	3669.4170	4969.7610	5877.0090	9727.6770
6	395.4846	639.0430	894.6831	1143.3120	1513.0245	2599.0220	3556.2970	4254.6180	6924.3350
7	282.9370	463.5243	650.4861	820.4137	1092.7505	1878.8140	2545.5600	3047.9630	5029.4130
8	200.5556	337.8791	464.1910	586.8608	782.9774	1359.8330	1815.2730	2183.7390	3523.7750
9+	1158.5260	1364.0150	1499.5100	1758.7160	2137.4775	2608.8780	3102.8910	3484.0130	4288.8060

2026

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2	1098.9910	1759.9650	2496.4440	3218.9080	4318.4955	7605.9580	10246.9400	12111.4800	20506.6100
3	926.1603	1469.1060	2111.7380	2626.4200	3500.5540	6108.1170	8195.7400	9734.3520	16057.9000
4	736.7365	1180.7020	1667.1500	2093.3880	2798.3635	4873.6630	6584.5210	7808.8900	13170.9200
5	548.1240	886.1283	1252.4160	1579.0510	2103.4375	3679.4300	4982.7430	5886.9260	9773.3310
6	398.6278	620.2747	886.7408	1143.1060	1522.4365	2656.9830	3598.7080	4255.4440	7044.0200

7	283.6747	458.3567	641.7349	820.0606	1085.2510	1864.2060	2550.8310	3051.7570	4966.4960
8	202.3875	331.5747	465.3211	586.8867	781.6811	1344.0040	1820.9740	2180.3610	3597.7070
9+	1247.1820	1455.7690	1595.1600	1867.9780	2244.8275	2707.1460	3212.1480	3598.6660	4308.3900

2027

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2	1120.4060	1814.8520	2521.6880	3216.8550	4277.0545	7400.3330	9929.0040	11966.3800	19441.2200
3	896.1530	1435.0920	2035.6250	2624.7770	3521.4825	6202.0110	8355.5180	9876.1740	16721.1500
4	739.0653	1172.3700	1685.1480	2095.8360	2793.4650	4874.1530	6539.8980	7768.1750	12814.2200
5	555.5100	890.2794	1257.0870	1578.4320	2109.9475	3674.8660	4964.6430	5888.1620	9931.0640
6	396.8872	641.6004	906.8340	1143.3280	1523.0570	2664.2110	3607.9050	4262.6050	7076.6060
7	285.9303	444.9133	636.0009	819.9162	1091.9740	1905.7540	2581.1770	3052.3190	5052.3570
8	202.9252	327.8861	459.0761	586.6375	776.3278	1333.5410	1824.6850	2183.1130	3552.7040
9+	1320.6760	1532.1160	1665.7090	1933.7160	2310.6255	2774.7100	3295.4390	3649.3180	4330.2570

2028

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2	1122.3550	1777.0520	2507.1660	3218.4690	4294.7995	7445.5530	10207.0900	11931.5200	19973.1800
3	913.6154	1479.8940	2056.3010	2623.1170	3487.6545	6034.2250	8096.5010	9757.5090	15852.4500
4	715.1183	1145.2260	1624.4070	2094.5900	2810.1935	4949.2860	6667.6650	7881.1290	13343.9300
5	557.2712	883.9569	1270.6200	1580.2900	2106.3065	3675.2150	4931.1400	5857.3480	9662.3150
6	402.2155	644.6363	910.2400	1142.9580	1527.8020	2660.8500	3594.6890	4263.4810	7190.8020
7	284.6822	460.1916	650.4455	820.0928	1092.4640	1910.9580	2587.7370	3057.3940	5075.7810
8	204.5337	318.2569	454.9625	586.5204	781.1341	1363.1900	1846.4230	2183.4810	3614.1300
9+	1334.5780	1565.8470	1708.1020	1980.6130	2365.6260	2817.3350	3323.2240	3668.8400	4459.7750

2029

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2	1146.9520	1825.8780	2533.1740	3216.0540	4273.1920	7436.8880	9982.7790	12020.5300	20087.0900
3	915.1834	1449.0300	2044.4310	2624.3870	3502.0805	6071.2660	8323.0760	9729.7040	16286.4600
4	729.0603	1180.9470	1640.9330	2093.2210	2783.1265	4815.3150	6460.9950	7786.1430	12650.3900
5	539.2058	863.5367	1224.8510	1579.3430	2118.8795	3731.7980	5027.4520	5942.4630	10061.1600
6	403.5078	640.0272	920.0044	1144.2550	1525.1530	2661.1810	3570.5820	4241.1460	6996.3680
7	288.4917	462.3770	652.8683	819.8329	1095.8280	1908.6070	2578.3970	3058.1590	5157.6910

8 203.6445 329.1968 465.2836 586.6442 781.4661 1366.9710 1851.1640 2187.0620
3630.9690
9+ 1376.2770 1590.2730 1738.6390 2019.2070 2407.2480 2859.9100 3358.7780 3723.7460
4559.4780

2030

Age 1% 5% 10% 25% 50% 75% 90% 95%
99%
1 1331.8160 2147.3870 3032.5100 3931.3430 5208.6800 8955.7610 12089.6900 14716.4400
24672.3600
2 1124.7080 1841.7020 2554.3980 3218.6290 4288.7635 7612.1460 10195.3400 12087.5800
20333.3600
3 935.2335 1488.8820 2065.5470 2622.4250 3484.4485 6064.3130 8140.2000 9801.7930
16379.3900
4 730.3032 1156.3430 1631.4780 2094.2830 2794.6895 4844.8300 6641.6250 7764.2580
12996.6700
5 549.7191 890.4454 1237.3120 1578.3320 2098.4885 3630.8150 4871.6050 5870.8170
9538.4670
6 390.4187 625.2924 886.8581 1143.5690 1534.2755 2702.0540 3640.3260 4302.7940
7284.9630
7 289.4232 459.0681 659.9237 820.7497 1093.9710 1908.8080 2561.0230 3042.0550
5018.1650
8 206.3692 330.7607 467.0243 586.4444 783.9130 1365.2560 1844.4530 2187.6730
3689.6090
9+ 1413.2170 1621.7470 1762.3460 2052.3950 2431.0655 2892.6360 3408.2880 3768.1750
4554.8110

Requested Percentile Report

Percentile = 90.00 %

2012 2013 2014 2015 2016 2017
2018 2019 2020 2021 2022 2023 2024 2025 2026
2027 2028 2029 2030

Recruits 12417.3800 12558.8100 12336.3400 12195.0400 12012.8400 12179.7600
12217.6500 12242.8800 12388.5500 12421.2300 12376.0000 12291.8500 12532.5100 12143.3200
12483.8100 12208.9400 12469.8800 12089.6900 11930.1300
Spawning Stock Biomass 11.6725 11.3256 14.4005 20.1319 29.0548 38.5566
46.5508 52.6069 59.3474 67.0697 71.8890 75.2281 77.7721 79.4562 80.7948
81.9727 82.5912 83.1331 83.5996
Jan-1 Stock Biomass 16.4055 15.5239 21.0962 29.6147 40.3006 50.8472
58.8928 65.3780 72.5186 80.8081 86.1302 89.9409 92.7544 94.3532 96.0533
97.0512 97.8812 98.2907 98.8265
Mean Biomass 17.4804 19.6206 27.6101 39.0530 51.0098 61.1463
68.7795 75.1298 81.5148 88.0690 92.4548 95.8568 98.1970 99.8396 101.1452
102.0921 102.8094 103.2124 103.2998
Combined Catch Biomass 6.0300 1.4997 1.8076 2.3842 3.5650 4.9344
6.1189 7.0745 8.0180 8.9071 9.5062 9.9211 10.2162 10.4445 10.6223
10.7491 10.8442 10.9317 10.9720
Landings 6.0300 1.4997 1.8076 2.3842 3.5650 4.9344
6.1189 7.0745 8.0180 8.9071 9.5062 9.9211 10.2162 10.4445 10.6223
10.7491 10.8442 10.9317 10.9720
FMort 1.3624 0.1350 0.1350 0.1350 0.1350 0.1350
0.1350 0.1350 0.1350 0.1350 0.1350 0.1350 0.1350 0.1350 0.1350
0.1350 0.1350 0.1350 0.1350

Stock Numbers at Age
Age 1 4083.9300 12417.3800 12558.8100 12336.3400 12195.0400 12012.8400
12179.7600 12217.6500 12242.8800 12388.5500 12421.2300 12376.0000 12291.8500 12532.5100
12143.3200 12483.8100 12208.9400 12469.8800 12089.6900
Age 2 1707.4100 3324.6740 10152.7000 10268.2700 10086.6300 9971.1160
9821.9490 9958.5980 9989.3370 10010.1000 10129.3900 10155.9400 10119.1400 10050.5500 10246.9400
9929.0040 10207.0900 9982.7790 10195.3400
Age 3 2111.8400 1365.7460 2711.0950 8278.1560 8373.2590 8224.9560
8130.7350 8008.8830 8120.6390 8145.3940 8162.6660 8259.7820 8281.0480 8251.3360 8195.7400
8355.5180 8096.5010 8323.0760 8140.2000

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Age 4                       2088.9300  1507.7990  1089.9100  2163.4570  6605.8870  6681.9280
6563.2140  6488.2460  6391.0380  6480.4340  6500.2480  6513.7770  6591.1230  6608.3560  6584.5210
6539.8980  6667.6650  6460.9950  6641.6250
Age 5                       1357.4100  1182.4960  1136.9180   821.7846  1631.2630  4980.8150
5038.2250  4948.5970  4892.1270  4818.9570  4886.3420  4901.3330  4911.4410  4969.7610  4982.7430
4964.6430  4931.1400  5027.4520  4871.6050
Age 6                        637.8940   652.0553   856.2113   823.2156   595.0275  1181.1730
3606.4860  3647.9490  3583.1550  3542.3160  3489.2880  3538.0910  3548.9320  3556.2970  3598.7080
3607.9050  3594.6890  3570.5820  3640.3260
Age 7                        283.2270   293.7948   467.6931   614.1483   590.4597   426.7898
847.2475  2586.8190  2616.5300  2570.0800  2540.7810  2502.7720  2537.7190  2545.5600  2550.8310
2581.1770  2587.7370  2578.3970  2561.0230
Age 8                         61.3528   125.8059   210.1639   334.5703   439.3279   422.4051
305.2989   606.0636  1850.4120  1871.6980  1838.4360  1817.5090  1790.3670  1815.2730  1820.9740
1824.6850  1846.4230  1851.1640  1844.4530
Age 9                         47.8801    48.1659   125.2263   240.0716   403.6189   592.8047
695.4741   670.6410   906.9653  1892.6980  2400.3890  2752.5820  2986.8530  3102.8910  3212.1480
3295.4390  3323.2240  3358.7780  3408.2880
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Scenario 3 Projection

```
AGEPRO VERSION 4.2

SAW55_3BLOCK_BASE

Date & Time of Run: 01 Mar 2013  11:52

Input File Name:
D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\GOMCOD_SAW55_3BLOCK_BASE_SHORT_75FMSY_12CAT6617_SCENARIO3.INP

First Age Class:                        1
Number of Age Classes:                  9
Number of Years in Projection:         19
Number of Fleets:                       1
Number of Recruitment Models:           1
Number of Bootstraps:                1000
Number of Simulations:                 10

Bootstrap File Name:            D:\NIT\GROUNDFISH_SARC55_COD\GOMCOD\SAW55_3BLOCK_BASE_MCMC.BSN

Number of Feasible Solutions:      10000  of      10000 Realizations

Input Harvest Scenario

Year  Type         Value

2012  Landings       6617
2013  F-Mult       0.1350
2014  F-Mult       0.1350
2015  F-Mult       0.1350
2016  F-Mult       0.1350
2017  F-Mult       0.1350
2018  F-Mult       0.1350
2019  F-Mult       0.1350
2020  F-Mult       0.1350
2021  F-Mult       0.1350
2022  F-Mult       0.1350
2023  F-Mult       0.1350
2024  F-Mult       0.1350
2025  F-Mult       0.1350
2026  F-Mult       0.1350
2027  F-Mult       0.1350
2028  F-Mult       0.1350
2029  F-Mult       0.1350
2030  F-Mult       0.1350

Recruits        1000  Fish

Year Class   Average        StdDev
2012       6926.7937     4465.8077
2013       6923.5380     4386.4587
```

2014	6937.4571	4438.1684
2015	6919.2931	4527.0696
2016	6848.1821	4336.7865
2017	6927.8128	4327.1141
2018	6904.8750	4345.1040
2019	6853.8386	4341.3137
2020	6939.1845	4398.8850
2021	6952.5694	4402.3823
2022	6973.7562	4462.6114
2023	6932.3252	4365.9713
2024	7044.3441	4564.4314
2025	6897.3804	4358.1031
2026	6933.3608	4380.3428
2027	6924.7521	4452.7725
2028	7017.1113	4540.7667
2029	6852.1367	4397.8307
2030	6883.5775	4300.2626

Recruits Distribution

Year	Class	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012		1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2013		1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2014		1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2015		1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2016		1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2017		1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2018		1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2019		1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2020		1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2021		1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2022		1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2023		1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2024		1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2025		1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2026		1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2027		1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2028		1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2029		1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600
2030		1347.1080	2222.8420	3135.0670	3934.5510	5235.3460	9103.0150	11930.1300	14588.2800	23922.8900

Spawning Stock Biomass x 1000 MT

Year	Average	StdDev
2012	8.3707	2.3863
2013	7.3455	2.6826
2014	10.1165	2.8985
2015	14.9578	3.5807
2016	21.6694	5.3628
2017	28.6703	7.1667
2018	34.7188	8.3692

2019	39.8791	9.2320
2020	45.8292	9.9437
2021	51.8969	11.2043
2022	56.2300	11.7406
2023	59.3332	12.0087
2024	61.5687	12.1824
2025	63.1808	12.2105
2026	64.3960	12.2510
2027	65.2741	12.3115
2028	65.8926	12.4036
2029	66.3618	12.4648
2030	66.6876	12.5129

Spawning Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	3.2207	4.7299	5.3625	6.7483	8.1958	9.7759	11.5080	12.6272	14.6713
2013	2.0827	3.3778	4.0406	5.4677	7.0529	8.9109	10.8338	12.0969	14.6260
2014	4.3813	5.8203	6.6158	8.0908	9.8331	11.8045	13.9229	15.3812	17.9780
2015	8.0185	9.7826	10.7239	12.4788	14.5442	17.0736	19.6601	21.5372	25.2573
2016	12.3138	14.4158	15.6161	17.9356	20.9256	24.5683	28.5965	31.5944	38.4106
2017	16.5244	19.0474	20.6323	23.5262	27.6123	32.4905	38.1498	42.3471	50.1313
2018	20.4957	23.2388	25.1544	28.7073	33.4673	39.2510	46.2192	50.4019	59.2919
2019	23.7680	27.1099	29.1430	33.2872	38.5753	45.2674	52.3769	56.9110	66.7404
2020	28.0985	31.9136	34.2004	38.6942	44.5027	51.6827	59.1737	64.1108	74.5260
2021	31.7703	35.9997	38.7692	43.8736	50.4985	58.5162	66.9476	72.5272	83.6576
2022	34.4524	39.1508	42.2279	47.8095	54.9200	63.3221	71.8019	77.3839	89.1396
2023	36.8528	41.7592	44.9552	50.7529	58.0737	66.5909	75.1603	80.9946	92.6538
2024	38.2846	43.6653	47.0368	52.8716	60.4391	68.9118	77.7280	83.5214	95.9039
2025	39.8267	45.0926	48.3986	54.4465	62.0595	70.5122	79.4253	84.9740	96.7255
2026	40.8031	46.2848	49.6020	55.6801	63.3489	71.9608	80.7742	86.4613	97.3285
2027	41.7602	47.1903	50.3653	56.4095	64.0785	72.8756	81.9580	87.4304	98.3402
2028	42.3626	47.6645	51.0034	56.9364	64.6512	73.3945	82.5792	88.1465	99.2897
2029	43.1121	47.9667	51.2946	57.3375	65.1554	74.0528	83.1248	88.7888	100.4897
2030	43.2059	48.3282	51.6476	57.5709	65.4025	74.4038	83.5940	89.1385	100.3408

JAN-1 Stock Biomass x 1000 MT

Year	Average	StdDev
2012	12.8419	2.7428
2013	10.7819	3.2250
2014	15.5185	3.7914
2015	22.2253	5.2736
2016	30.2105	7.3362
2017	38.0238	9.1413
2018	44.6160	10.2998
2019	50.2239	11.0987
2020	56.6945	11.7587
2021	63.2882	13.0253
2022	68.0113	13.5785
2023	71.4113	13.8755

2024	73.8602	14.0701
2025	75.6265	14.0981
2026	76.9583	14.1426
2027	77.9027	14.2312
2028	78.5541	14.3388
2029	79.0645	14.3853
2030	79.4252	14.4249

JAN-1 Stock Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	7.2801	8.7308	9.4238	10.9381	12.5757	14.4349	16.4055	17.7124	20.3350
2013	4.3892	5.9895	6.8679	8.5259	10.4891	12.6491	14.9778	16.6241	19.4779
2014	8.0609	9.9205	10.9790	12.8703	15.1348	17.8278	20.5732	22.4018	25.8390
2015	12.7559	14.8944	16.1807	18.5550	21.5493	25.1302	29.1105	31.8711	38.2722
2016	17.5947	20.2778	21.9270	25.0173	29.1684	34.0871	39.8059	44.1142	52.5287
2017	22.4423	25.5036	27.6012	31.4633	36.7649	42.9511	50.3985	55.2995	65.3827
2018	26.7779	30.4227	32.6767	37.2316	43.1690	50.5413	58.5456	63.7148	74.5455
2019	30.4878	34.6635	37.2377	42.2368	48.7802	56.7652	65.1248	70.5006	82.7700
2020	35.4974	39.9369	42.8605	48.3256	55.2551	63.7154	72.3343	78.4065	89.8859
2021	39.2294	44.5703	47.8206	54.0043	61.8235	71.1085	80.6706	87.2477	99.3651
2022	42.4201	48.1486	51.8154	58.2779	66.6056	76.2609	86.0421	92.2718	105.6796
2023	44.9814	51.0000	54.8049	61.5548	70.0293	79.8734	89.8720	96.1395	110.0397
2024	46.6659	53.0756	56.8750	63.8590	72.6373	82.3180	92.7080	98.8852	113.2497
2025	48.5398	54.6075	58.5340	65.5494	74.3158	84.3027	94.3168	101.0543	113.9938
2026	49.4142	56.0999	59.8216	66.8903	75.6976	85.8033	96.0285	102.2842	114.4393
2027	50.5649	56.9981	60.7077	67.7325	76.5736	86.7217	97.0341	103.4299	115.5498
2028	51.3642	57.2748	61.2160	68.3305	77.1168	87.3255	97.8692	104.1856	117.3512
2029	52.0201	57.7608	61.6730	68.6744	77.7365	87.9693	98.2819	104.8651	118.3276
2030	51.7728	58.1763	62.0287	68.9516	78.0872	88.4651	98.8195	105.1983	117.7005

Mean Biomass x 1000 MT

Year	Average	StdDev
2012	12.6471	3.4475
2013	14.1596	3.7125
2014	20.7061	4.8873
2015	29.1779	7.2373
2016	37.8841	9.5292
2017	45.6001	11.0776
2018	52.1371	12.0819
2019	57.7808	12.7724
2020	63.6647	13.2787
2021	69.2632	14.0711
2022	73.2765	14.4480
2023	76.1885	14.6742
2024	78.3016	14.8263
2025	79.8392	14.8682
2026	80.9809	14.9296
2027	81.7894	15.0362
2028	82.3342	15.1312

2029	82.7603	15.1450
2030	83.0646	15.1699

Mean Biomass Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	5.4277	7.4256	8.3433	10.2984	12.3219	14.6519	17.1515	18.6479	21.6450
2013	6.6742	8.6207	9.6904	11.5394	13.8261	16.4388	19.0617	20.8624	24.0473
2014	11.5661	13.8003	15.0409	17.3193	20.0955	23.4258	27.0951	29.5815	35.1838
2015	16.8162	19.6411	21.0928	24.1054	28.1072	32.9465	38.5784	42.8138	51.9526
2016	21.9868	25.0860	27.1795	31.0559	36.4555	42.9171	50.5697	56.1010	66.3937
2017	26.5627	30.4000	32.8851	37.6213	43.9413	51.7389	60.7589	66.3392	78.3261
2018	30.9964	35.4041	38.0698	43.5401	50.5243	59.2142	68.4900	74.3897	87.4692
2019	34.8301	39.7733	42.7670	48.6028	56.1595	65.3948	74.9173	81.3224	94.4662
2020	39.4711	44.5804	47.9155	54.2107	62.0514	71.7027	81.3604	88.2782	100.8548
2021	42.8095	48.7784	52.4979	59.2362	67.7354	77.8804	87.9469	94.8773	108.3159
2022	45.7954	52.0441	55.9930	62.9898	71.8973	82.1041	92.3682	98.9749	112.9762
2023	47.9059	54.4766	58.5298	65.7378	74.7781	84.9538	95.7962	102.2107	116.9020
2024	49.8576	56.3562	60.2914	67.6822	76.9555	87.3126	98.1513	104.9002	118.3027
2025	51.0357	57.7984	61.8162	69.2981	78.5520	89.0591	99.8092	106.4916	119.9960
2026	51.9738	59.1287	62.9076	70.3176	79.5575	90.2639	101.1207	107.6179	120.8724
2027	53.1940	59.6555	63.6317	71.0087	80.2275	90.9309	102.0776	108.7216	122.1873
2028	54.0237	60.0607	64.0235	71.4433	80.8011	91.6368	102.7988	109.7334	123.1481
2029	53.8994	60.4384	64.3882	71.8110	81.3714	92.2227	103.2050	109.8976	123.6726
2030	54.1137	60.8856	64.8240	72.0883	81.7348	92.4500	103.2946	110.1311	123.2668

Combined Catch Biomass x 1000 MT

Year	Average	StdDev
2012	6.6170	0.0000
2013	0.9423	0.3722
2014	1.2160	0.4019
2015	1.7547	0.4282
2016	2.6578	0.6621
2017	3.6453	0.9544
2018	4.5238	1.1456
2019	5.2895	1.2939
2020	6.0828	1.4050
2021	6.8386	1.5428
2022	7.3791	1.5988
2023	7.7625	1.6260
2024	8.0399	1.6434
2025	8.2423	1.6485
2026	8.3945	1.6571
2027	8.5043	1.6653
2028	8.5867	1.6753
2029	8.6461	1.6854
2030	8.6848	1.6920

Combined Catch Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170
2013	0.2117	0.3923	0.4755	0.6793	0.9102	1.1682	1.4300	1.5966	1.9504
2014	0.4276	0.6257	0.7215	0.9420	1.1720	1.4522	1.7391	1.9410	2.2982
2015	0.8911	1.1176	1.2402	1.4535	1.7172	2.0210	2.3194	2.5214	2.9126
2016	1.4963	1.7682	1.9187	2.2009	2.5622	3.0104	3.5035	3.8809	4.7550
2017	2.0691	2.4008	2.5836	2.9669	3.4955	4.1319	4.8833	5.4780	6.6558
2018	2.6182	2.9813	3.2281	3.7036	4.3533	5.1325	6.0778	6.6994	7.9537
2019	3.0702	3.5187	3.7934	4.3611	5.0998	6.0289	7.0447	7.7031	9.0535
2020	3.6258	4.1302	4.4491	5.0792	5.8928	6.9021	7.9964	8.6576	10.1893
2021	4.0760	4.6515	5.0403	5.7340	6.6293	7.7550	8.8916	9.6962	11.2523
2022	4.4490	5.0746	5.4806	6.2373	7.1954	8.3455	9.4952	10.2916	11.8210
2023	4.7304	5.4026	5.8264	6.5951	7.5826	8.7465	9.9131	10.6872	12.2917
2024	4.9370	5.6490	6.0838	6.8688	7.8656	9.0296	10.2108	11.0035	12.6181
2025	5.1170	5.8258	6.2485	7.0607	8.0952	9.2291	10.4401	11.1983	12.7587
2026	5.2508	5.9333	6.3977	7.2112	8.2342	9.4128	10.6194	11.3908	12.9317
2027	5.3829	6.0639	6.4993	7.3072	8.3381	9.5202	10.7469	11.5018	12.9662
2028	5.4434	6.1481	6.5974	7.3810	8.4085	9.6005	10.8428	11.6075	13.1442
2029	5.5133	6.1760	6.6251	7.4272	8.4794	9.6609	10.9306	11.6998	13.2369
2030	5.5402	6.2219	6.6486	7.4569	8.5079	9.7395	10.9713	11.7206	13.2949

Landings x 1000 MT

Year	Average	StdDev
2012	6.6170	0.0000
2013	0.9423	0.3722
2014	1.2160	0.4019
2015	1.7547	0.4282
2016	2.6578	0.6621
2017	3.6453	0.9544
2018	4.5238	1.1456
2019	5.2895	1.2939
2020	6.0828	1.4050
2021	6.8386	1.5428
2022	7.3791	1.5988
2023	7.7625	1.6260
2024	8.0399	1.6434
2025	8.2423	1.6485
2026	8.3945	1.6571
2027	8.5043	1.6653
2028	8.5867	1.6753
2029	8.6461	1.6854
2030	8.6848	1.6920

Landings Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%
2012	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170	6.6170

2013	0.2117	0.3923	0.4755	0.6793	0.9102	1.1682	1.4300	1.5966
1.9504								
2014	0.4276	0.6257	0.7215	0.9420	1.1720	1.4522	1.7391	1.9410
2.2982								
2015	0.8911	1.1176	1.2402	1.4535	1.7172	2.0210	2.3194	2.5214
2.9126								
2016	1.4963	1.7682	1.9187	2.2009	2.5622	3.0104	3.5035	3.8809
4.7550								
2017	2.0691	2.4008	2.5836	2.9669	3.4955	4.1319	4.8833	5.4780
6.6558								
2018	2.6182	2.9813	3.2281	3.7036	4.3533	5.1325	6.0778	6.6994
7.9537								
2019	3.0702	3.5187	3.7934	4.3611	5.0998	6.0289	7.0447	7.7031
9.0535								
2020	3.6258	4.1302	4.4491	5.0792	5.8928	6.9021	7.9964	8.6576
10.1893								
2021	4.0760	4.6515	5.0403	5.7340	6.6293	7.7550	8.8916	9.6962
11.2523								
2022	4.4490	5.0746	5.4806	6.2373	7.1954	8.3455	9.4952	10.2916
11.8210								
2023	4.7304	5.4026	5.8264	6.5951	7.5826	8.7465	9.9131	10.6872
12.2917								
2024	4.9370	5.6490	6.0838	6.8688	7.8656	9.0296	10.2108	11.0035
12.6181								
2025	5.1170	5.8258	6.2485	7.0607	8.0952	9.2291	10.4401	11.1983
12.7587								
2026	5.2508	5.9333	6.3977	7.2112	8.2342	9.4128	10.6194	11.3908
12.9317								
2027	5.3829	6.0639	6.4993	7.3072	8.3381	9.5202	10.7469	11.5018
12.9662								
2028	5.4434	6.1481	6.5974	7.3810	8.4085	9.6005	10.8428	11.6075
13.1442								
2029	5.5133	6.1760	6.6251	7.4272	8.4794	9.6609	10.9306	11.6998
13.2369								
2030	5.5402	6.2219	6.6486	7.4569	8.5079	9.7395	10.9713	11.7206
13.2949								

Total Fishing Mortality

Year	Average	StdDev
2012	1.0611	0.4506
2013	0.1350	0.0000
2014	0.1350	0.0000
2015	0.1350	0.0000
2016	0.1350	0.0000
2017	0.1350	0.0000
2018	0.1350	0.0000
2019	0.1350	0.0000
2020	0.1350	0.0000
2021	0.1350	0.0000
2022	0.1350	0.0000
2023	0.1350	0.0000
2024	0.1350	0.0000
2025	0.1350	0.0000
2026	0.1350	0.0000
2027	0.1350	0.0000
2028	0.1350	0.0000
2029	0.1350	0.0000
2030	0.1350	0.0000

Total Fishing Mortality Distribution

Year	1%	5%	10%	25%	50%	75%	90%	95%
99%								
2012	0.4887	0.5863	0.6505	0.7746	0.9580	1.2119	1.6003	1.8910
2.7946								
2013	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								
2014	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
0.1350								

2015	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2016	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2017	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2018	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2019	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2020	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2021	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2022	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2023	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2024	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2025	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2026	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2027	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2028	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2029	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350
2030	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350	0.1350

JAN-1 Stock Numbers at Age - 1000 Fish

2012

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	3470.7100	3582.0200	3630.7900	3733.1100	3845.4000	3970.9800	4083.9300	4158.3900	4317.7200
2	238.3360	346.6600	439.6270	636.1570	927.1550	1288.8100	1707.4100	2053.8300	2637.8900
3	628.9300	792.3810	889.8900	1098.6100	1389.0900	1699.8800	2111.8400	2331.2900	2895.3200
4	924.0740	1046.1800	1143.1600	1345.3900	1586.0550	1844.7200	2088.9300	2260.2700	2689.6800
5	541.8520	638.9290	722.4190	836.8020	993.8315	1180.0600	1357.4100	1491.0000	1750.6100
6	205.2150	265.2180	300.2310	360.2070	439.7105	535.3540	637.8940	691.6980	865.0120
7	82.4731	99.1877	117.2230	146.9100	185.1170	230.8150	283.2270	314.3510	388.2850
8	13.6543	18.2450	21.2075	27.9255	37.2013	48.9121	61.3528	70.3407	89.6368
9+	8.5168	11.6466	14.5945	19.3767	26.8609	36.7221	47.8801	56.9625	73.2486

2013

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1391.0880	2176.8350	3117.3750	3934.3440	5224.9320	8997.3260	12417.3800	14724.4000	24545.3000
2	2774.1210	2880.4780	2926.2260	3018.5840	3116.7510	3224.2650	3322.3640	3382.9520	3514.3870
3	181.3974	276.1476	349.5488	505.4113	734.1711	1022.4540	1360.2740	1626.0610	2111.2530
4	356.8716	484.7175	565.7210	727.5435	937.8159	1171.9120	1477.4620	1652.2370	2044.5440

5	133.3340	290.9669	367.1557	532.2454	723.2937	917.3582	1125.7680	1252.4070	1565.2920
6	31.5879	97.1351	142.8672	227.1534	340.9115	470.9063	606.3292	705.8688	888.6876
7	10.8248	34.3083	50.9393	90.5921	140.9572	201.0187	273.4864	312.2929	414.2473
8	3.9447	12.9517	19.8196	36.7199	58.2816	83.9559	116.5031	142.4484	193.2216
9+	1.2215	4.3558	5.9807	12.1301	20.0789	30.9626	44.4976	54.3927	78.0699

2014

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1378.5500	2220.4250	3084.9370	3934.8880	5219.5770	9107.9500	12558.8100	14679.2300	23718.6500
2	1137.4290	1779.8250	2548.8050	3216.7850	4272.0765	7356.3970	10152.7000	12039.0400	20068.7800
3	2262.0860	2348.8110	2386.1210	2461.4200	2541.4375	2629.1390	2709.1360	2758.5810	2865.7240
4	144.7544	220.3677	278.9430	403.3133	585.8679	815.9260	1085.5220	1297.6050	1684.7770
5	269.0817	365.4922	426.5543	548.5775	707.1183	883.6331	1113.9960	1245.8410	1541.6410
6	96.5444	210.6896	265.8515	385.3874	523.7206	664.2330	815.1514	906.8532	1133.3990
7	22.6564	69.6697	102.4695	162.9325	244.5217	337.7673	434.8943	506.2878	637.4154
8	7.7436	24.5413	36.4379	64.8046	100.8349	143.7957	195.6345	223.3964	296.3394
9+	3.7710	12.3896	18.3306	35.1017	56.7026	82.6412	115.3082	141.8393	192.3448

2015

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1368.0180	2148.0540	3103.4100	3933.5090	5219.5095	9193.6920	12336.3400	14652.5500	24503.1900
2	1127.1350	1815.4210	2522.3270	3217.2680	4267.5945	7447.0390	10268.2700	12002.2300	19392.9500
3	927.4998	1451.2620	2078.4230	2623.0000	3483.5215	5998.6630	8278.1560	9817.0450	16363.8300
4	1805.1590	1874.3470	1904.1920	1964.1650	2028.0485	2098.0720	2161.8840	2201.3690	2286.9150
5	109.1482	166.1599	210.3290	304.0979	441.7519	615.2135	818.4941	978.4177	1270.3630
6	194.8322	264.6472	308.8556	397.2105	512.0130	639.8197	806.6140	902.1197	1116.2630
7	69.2492	151.1219	190.6868	276.4253	375.6474	476.4473	584.6835	650.4439	812.9900
8	16.2074	49.8385	73.3010	116.5530	174.9167	241.6206	311.0961	362.1831	455.9809
9+	8.1177	25.0774	38.6956	71.9107	112.4041	159.6926	223.1524	257.0918	356.4472

2016

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1354.9750	2090.6770	3026.4270	3933.6580	5224.5540	9038.6270	12195.0400	14685.9400	25285.6600
2	1118.5380	1756.2910	2537.4690	3216.1820	4267.5195	7516.9450	10086.6300	11980.7700	20034.5600
3	919.0880	1480.2840	2056.7610	2623.4060	3479.8840	6072.5310	8373.2590	9787.0510	15813.1400
4	740.1478	1158.0960	1658.6070	2093.1400	2779.8275	4787.0090	6605.8870	7834.0910	13058.5900
5	1361.1500	1413.3090	1435.7620	1481.0200	1529.1705	1581.9570	1630.0890	1659.8350	1724.3420

6	79.0325	120.3139	152.2962	220.1869	319.8642	445.4645	592.6532	708.4553	919.8483
7	139.7525	189.8287	221.5348	284.9114	367.2498	458.9371	578.5711	647.0390	800.6811
8	49.5386	108.1042	136.4052	197.7399	268.7208	340.8201	418.2470	465.3135	581.5570
9+	17.3022	53.9007	81.8519	137.1310	206.1426	291.4024	377.4065	444.6724	577.6307

2017

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1364.8090	2151.5700	3077.1790	3932.5260	5208.8510	9011.9920	12012.8400	14627.4100	23761.4300
2	1107.8540	1709.4190	2474.4290	3216.2170	4271.8110	7389.9540	9971.1160	12007.5700	20674.5000
3	912.0705	1432.1380	2069.1420	2622.5340	3479.7460	6129.5450	8224.9560	9769.4530	16336.4700
4	733.4144	1181.2650	1641.3140	2093.4530	2776.8990	4845.9020	6681.9280	7809.8560	12619.1600
5	558.1019	873.2225	1250.5980	1578.2670	2096.0060	3609.5080	4980.8150	5906.8700	9846.3210
6	985.5788	1023.3570	1039.5980	1072.3840	1107.2530	1145.4510	1180.2940	1201.8600	1248.5660
7	56.6889	86.2973	109.2379	157.9373	229.4268	319.5176	425.1031	508.1484	659.8060
8	99.9825	135.7911	158.4746	203.8064	262.7104	328.2928	413.8816	462.8398	572.7682
9+	46.8754	116.3247	156.4331	246.4233	344.7829	445.9597	561.4424	632.1784	786.1940

2018

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1345.6260	2267.1890	3114.3340	3937.7130	5253.7270	9124.6440	12179.7600	14650.4900	23644.6200
2	1115.9240	1759.1660	2515.9590	3215.3770	4258.9025	7368.5480	9821.9490	11959.8700	19428.6500
3	903.3702	1393.9150	2017.7090	2622.5540	3483.3230	6025.9050	8130.7350	9791.2270	16858.1700
4	727.8383	1142.8350	1651.2240	2092.7840	2776.8795	4891.4610	6563.2140	7795.9790	13037.0400
5	553.0019	890.6967	1237.5440	1578.4800	2093.7790	3653.8520	5038.2250	5888.7940	9515.1940
6	404.0864	632.2822	905.5343	1142.8020	1517.7015	2613.6220	3606.4860	4277.0250	7129.6010
7	706.9493	734.0347	745.6770	769.1823	794.1959	821.5948	846.5946	862.0648	895.5761
8	40.5521	61.7329	78.1424	112.9773	164.1172	228.5663	304.1030	363.5022	471.9830
9+	123.1241	204.1652	242.9808	333.9646	442.8184	551.2451	667.9756	746.9725	897.4369

2019

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1357.9650	2224.9040	3122.1830	3937.8460	5244.6860	9017.8920	12217.6500	14629.7900	24138.6100
2	1100.2330	1853.7570	2546.4220	3219.5910	4295.6000	7460.3590	9958.5980	11978.3500	19331.8100
3	909.9492	1434.4700	2051.4950	2621.8620	3472.7550	6008.5690	8008.8830	9752.1880	15841.6400
4	720.8946	1112.3320	1610.1070	2092.8270	2779.6765	4808.5690	6488.2460	7813.2220	13452.9700
5	548.7850	861.7011	1245.0160	1577.9510	2093.7875	3688.2640	4948.5970	5878.0740	9829.8000
6	400.4097	644.9303	896.0754	1142.9560	1516.0855	2645.7210	3647.9490	4263.9800	6889.9040

7	289.8505	453.5339	649.5140	819.6927	1088.6110	1874.6280	2586.8190	3067.8090	5113.9750
8	505.6984	525.0814	533.4259	550.2347	568.1199	587.7202	605.5906	616.6703	640.6309
9+	146.6517	232.4930	268.7290	347.7120	435.9282	546.9543	650.1713	721.5776	887.9285

2020

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1361.4820	2200.1370	3079.9840	3936.1300	5208.7835	8947.7190	12242.8800	14648.1400	23837.6100
2	1110.3190	1819.1110	2552.7440	3219.6580	4288.2935	7373.3010	9989.3370	11961.9400	19735.8800
3	897.1829	1511.5700	2076.3240	2625.3310	3502.6825	6083.4420	8120.6390	9767.6120	15763.4300
4	726.1269	1144.7000	1637.0580	2092.2290	2771.2705	4794.8340	6391.0380	7782.1220	12641.6300
5	543.5649	838.6869	1214.0580	1578.0010	2095.8945	3625.7510	4892.1270	5891.3320	10143.4600
6	397.3667	623.9588	901.4730	1142.5420	1516.0840	2670.5180	3583.1550	4256.0880	7117.7840
7	287.1973	462.5921	642.7341	819.8184	1087.4505	1897.6700	2616.5300	3058.4810	4942.0150
8	207.3435	324.4391	464.6172	586.3600	778.7360	1341.0060	1850.4120	2194.5190	3658.2690
9+	482.3088	546.8116	584.4402	646.7120	720.6709	807.4739	891.7974	948.7829	1073.9540

2021

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.3320	2135.2460	3052.8640	3935.4070	5241.3945	9146.7490	12388.5500	14650.0200	24248.4400
2	1113.1630	1798.9530	2518.2430	3218.2750	4258.8600	7316.0820	10010.1000	11976.6700	19491.1200
3	905.4221	1483.3790	2081.5400	2625.3460	3496.8470	6012.0340	8145.3940	9754.2340	16092.9400
4	715.9504	1206.1900	1656.8960	2094.9840	2795.1080	4854.5570	6480.4340	7794.8400	12579.2700
5	547.5061	863.1365	1234.3780	1577.5440	2089.5550	3615.1990	4818.9570	5867.7190	9531.9450
6	393.5883	607.2635	879.0850	1142.5670	1517.5775	2625.2960	3542.3160	4265.6540	7344.6280
7	285.0155	447.5357	646.5931	819.5276	1087.4305	1915.3760	2570.0800	3052.6850	5105.4040
8	205.4528	330.9105	459.7776	586.4493	777.9032	1357.5000	1871.6980	2187.9410	3535.2590
9+	610.5289	740.2203	812.4622	931.0077	1114.3230	1486.0030	1882.3470	2121.3440	3116.0710

2022

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1366.3180	2208.9180	3122.0950	3936.2350	5243.1905	9172.1780	12421.2300	14674.0700	24361.1300
2	1122.0950	1745.8170	2496.1190	3217.7300	4285.5670	7478.6080	10129.3900	11978.3200	19826.1800
3	907.7031	1466.8820	2053.4650	2624.2580	3472.8015	5965.7690	8162.6660	9766.0380	15893.5400
4	722.5143	1183.7110	1661.0710	2095.0130	2790.4765	4797.5880	6500.2480	7783.9600	12842.6600
5	539.8292	909.4674	1249.3740	1579.6420	2107.5500	3660.2110	4886.3420	5877.4360	9484.5080
6	396.4355	624.9748	893.7929	1142.2610	1513.0145	2617.6950	3489.2880	4248.6460	6901.8430
7	282.3152	435.5614	630.5441	819.5519	1088.4860	1882.9780	2540.7810	3059.5500	5268.0820

8	203.8908	320.1367	462.5437	586.2388	777.8717	1370.1540	1838.4360	2183.6570	3652.0590
9+	796.2764	939.7003	1030.0450	1204.5620	1526.4215	1934.7440	2392.9760	2770.8110	3552.4620

2023

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1384.7770	2219.3670	3133.5810	3934.6860	5259.8645	9160.4460	12376.0000	14677.6600	24755.9700
2	1117.1360	1806.0780	2552.7390	3218.3690	4286.9890	7499.5600	10155.9400	11998.0200	19918.7900
3	914.9950	1423.6360	2035.3120	2623.7840	3494.5420	6098.2760	8259.7820	9767.6200	16166.9100
4	724.3465	1170.5540	1638.7150	2094.1550	2771.2765	4760.6900	6513.7770	7793.0330	12682.8900
5	544.7678	892.5291	1252.4560	1579.6570	2104.0380	3617.5190	4901.3330	5868.9660	9683.3850
6	390.8747	658.5197	904.6899	1143.7760	1526.0155	2650.3490	3538.0910	4255.8390	6867.7370
7	284.3454	448.2645	641.1104	819.3222	1085.2335	1877.5420	2502.7720	3047.4440	4950.4200
8	201.9511	311.5694	451.0427	586.2537	778.6482	1346.9920	1817.5090	2188.6270	3768.5410
9+	938.8861	1116.2420	1213.2450	1450.9370	1804.0030	2244.6920	2747.1610	3118.9490	3910.3190

2024

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1389.1490	2203.5560	3167.4080	3939.3770	5250.5365	9161.4850	12291.8500	14601.5300	24085.3500
2	1132.2230	1814.5720	2562.1120	3217.0910	4300.4750	7489.8460	10119.1400	12000.8200	20241.7400
3	910.9620	1472.7320	2081.5520	2624.3320	3495.7625	6115.2360	8281.0480	9783.7310	16242.4700
4	730.1470	1136.0870	1624.1820	2093.7560	2788.6430	4866.4010	6591.1230	7794.3790	12901.2900
5	546.1708	882.6226	1235.6340	1579.0210	2089.6065	3589.4960	4911.4410	5875.8230	9562.9530
6	394.4643	646.2357	906.8787	1143.7910	1523.4715	2619.3190	3548.9320	4249.6220	7011.9480
7	280.3581	472.3332	648.9195	820.3935	1094.5570	1900.9560	2537.7190	3052.6620	4926.0240
8	203.4054	320.6577	458.6080	586.0834	776.3060	1343.0700	1790.3670	2179.9810	3541.2940
9+	1053.9090	1242.9220	1366.0170	1626.5130	1999.0710	2450.9820	2982.7620	3362.9960	4175.4710

2025

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1344.1080	2152.4970	3053.2420	3936.9370	5281.6595	9302.4100	12532.5100	14812.5500	25080.2100
2	1135.8140	1801.6740	2589.7970	3220.9010	4293.0390	7490.7490	10050.5500	11938.5000	19692.4400
3	923.2274	1479.6400	2089.1810	2623.3180	3506.6925	6107.5390	8251.3360	9785.7750	16505.0000
4	726.9456	1175.2590	1661.0460	2094.2070	2789.6015	4879.9800	6608.3560	7807.5200	12961.7600
5	550.5285	856.6219	1224.6630	1578.7160	2102.6240	3669.4170	4969.7610	5877.0090	9727.6770
6	395.4846	639.0430	894.6831	1143.3120	1513.0245	2599.0220	3556.2970	4254.6180	6924.3350
7	282.9370	463.5243	650.4861	820.4137	1092.7505	1878.8140	2545.5600	3047.9630	5029.4130
8	200.5556	337.8791	464.1910	586.8608	782.9774	1359.8330	1815.2730	2183.7390	3523.7750

9+	1155.7790	1361.3410	1496.7560	1755.7380	2134.6510	2606.1270	3100.2290	3481.2600	4285.8420

2026

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1370.3160	2219.7410	3084.1560	3934.4160	5231.1815	9051.3350	12143.3200	14635.6800	23778.2800
2	1098.9910	1759.9650	2496.4440	3218.9080	4318.4955	7605.9580	10246.9400	12111.4800	20506.6100
3	926.1603	1469.1060	2111.7380	2626.4200	3500.5540	6108.1170	8195.7400	9734.3520	16057.9000
4	736.7365	1180.7020	1667.1500	2093.3880	2798.3635	4873.6630	6584.5210	7808.8900	13170.9200
5	548.1240	886.1283	1252.4160	1579.0510	2103.4375	3679.4300	4982.7430	5886.9260	9773.3310
6	398.6278	620.2747	886.7408	1143.1060	1522.4365	2656.9830	3598.7080	4255.4440	7044.0200
7	283.6747	458.3567	641.7349	820.0606	1085.2510	1864.2060	2550.8310	3051.7570	4966.4960
8	202.3875	331.5747	465.3211	586.8867	781.6811	1344.0040	1820.9740	2180.3610	3597.7070
9+	1245.1960	1453.7460	1593.1750	1865.9500	2242.7025	2704.9780	3210.1720	3596.7630	4306.4390

2027

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1372.7000	2173.4110	3066.4290	3936.4800	5252.7205	9106.2090	12483.8100	14592.7200	24428.4200
2	1120.4060	1814.8520	2521.6880	3216.8550	4277.0545	7400.3330	9929.0040	11966.3800	19441.2200
3	896.1530	1435.0920	2035.6250	2624.7770	3521.4825	6202.0110	8355.5180	9876.1740	16721.1500
4	739.0653	1172.3700	1685.1480	2095.8360	2793.4650	4874.1530	6539.8980	7768.1750	12814.2200
5	555.5100	890.2794	1257.0870	1578.4320	2109.9475	3674.8660	4964.6430	5888.1620	9931.0640
6	396.8872	641.6004	906.8340	1143.3280	1523.0570	2664.2110	3607.9050	4262.6050	7076.6060
7	285.9303	444.9133	636.0009	819.9162	1091.9740	1905.7540	2581.1770	3052.3190	5052.3570
8	202.9252	327.8861	459.0761	586.6375	776.3278	1333.5410	1824.6850	2183.1130	3552.7040
9+	1318.9960	1530.7810	1664.2110	1932.2340	2309.0975	2773.2310	3294.0470	3647.8810	4328.8200

2028

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1402.7780	2233.1340	3098.2700	3933.3740	5226.2710	9095.7350	12208.9400	14701.7200	24567.2500
2	1122.3550	1777.0520	2507.1660	3218.4690	4294.7995	7445.5530	10207.0900	11931.5200	19973.1800
3	913.6154	1479.8940	2056.3010	2623.1170	3487.6545	6034.2250	8096.5010	9757.5090	15852.4500
4	715.1183	1145.2260	1624.4070	2094.5900	2810.1935	4949.2860	6667.6650	7881.1290	13343.9300
5	557.2712	883.9569	1270.6200	1580.2900	2106.3065	3675.2150	4931.1400	5857.3480	9662.3150
6	402.2155	644.6363	910.2400	1142.9580	1527.8020	2660.8500	3594.6890	4263.4810	7190.8020
7	284.6822	460.1916	650.4455	820.0928	1092.4640	1910.9580	2587.7370	3057.3940	5075.7810
8	204.5337	318.2569	454.9625	586.5204	781.1341	1363.1900	1846.4230	2183.4810	3614.1300
9+	1333.5570	1564.8200	1707.1370	1979.6160	2364.5860	2816.3520	3322.1330	3667.7190	4458.8170

2029

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1375.5750	2252.4930	3124.1640	3936.5160	5245.2180	9310.0550	12469.8800	14784.1500	24868.9800
2	1146.9520	1825.8780	2533.1740	3216.0540	4273.1920	7436.8880	9982.7790	12020.5300	20087.0900
3	915.1834	1449.0300	2044.4310	2624.3870	3502.0805	6071.2660	8323.0760	9729.7040	16286.4600
4	729.0603	1180.9470	1640.9330	2093.2210	2783.1265	4815.3150	6460.9950	7786.1430	12650.3900
5	539.2058	863.5367	1224.8510	1579.3430	2118.8795	3731.7980	5027.4520	5942.4630	10061.1600
6	403.5078	640.0272	920.0044	1144.2550	1525.1530	2661.1810	3570.5820	4241.1460	6996.3680
7	288.4917	462.3770	652.8683	819.8329	1095.8280	1908.6070	2578.3970	3058.1590	5157.6910
8	203.6445	329.1968	465.2836	586.6442	781.4661	1366.9710	1851.1640	2187.0620	3630.9690
9+	1375.5600	1589.5790	1737.8990	2018.4310	2406.5475	2859.2150	3358.0420	3722.9950	4558.7730

2030

Age	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	1331.8160	2147.3870	3032.5100	3931.3430	5208.6800	8955.7610	12089.6900	14716.4400	24672.3600
2	1124.7080	1841.7020	2554.3980	3218.6290	4288.7635	7612.1460	10195.3400	12087.5800	20333.3600
3	935.2335	1488.8820	2065.5470	2622.4250	3484.4485	6064.3130	8140.2000	9801.7930	16379.3900
4	730.3032	1156.3430	1631.4780	2094.2830	2794.6895	4844.8300	6641.6250	7764.2580	12996.6700
5	549.7191	890.4454	1237.3120	1578.3320	2098.4885	3630.8150	4871.6050	5870.8170	9538.4670
6	390.4187	625.2924	886.8581	1143.5690	1534.2755	2702.0540	3640.3260	4302.7940	7284.9630
7	289.4232	459.0681	659.9237	820.7497	1093.9710	1908.8080	2561.0230	3042.0550	5018.1650
8	206.3692	330.7607	467.0243	586.4444	783.9130	1365.2560	1844.4530	2187.6730	3689.6090
9+	1412.6640	1621.2580	1761.8440	2051.8570	2430.5480	2892.1170	3407.7690	3767.6730	4554.3270

Requested Percentile Report

Percentile = 90.00 %

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Recruits	12417.3800	12558.8100	12336.3400	12195.0400	12012.8400	12179.7600	12217.6500	12242.8800	12388.5500	12421.2300	12376.0000	12291.8500	12532.5100	12143.3200	12483.8100	12208.9400	12469.8800	12089.6900	11930.1300
Spawning Stock Biomass	11.5080	10.8338	13.9229	19.6601	28.5965	38.1498	46.2192	52.3769	59.1737	66.9476	71.8019	75.1603	77.7280	79.4253	80.7742	81.9580	82.5792	83.1248	83.5940
Jan-1 Stock Biomass	16.4055	14.9778	20.5732	29.1105	39.8059	50.3985	58.5456	65.1248	72.3343	80.6706	86.0421	89.8720	92.7080	94.3168	96.0285	97.0341	97.8692	98.2819	98.8195
Mean Biomass	17.1515	19.0617	27.0951	38.5784	50.5697	60.7589	68.4900	74.9173	81.3604	87.9469	92.3682	95.7962	98.1513	99.8092	101.1207	102.0776	102.7988	103.2050	103.2946
Combined Catch Biomass	6.6170	1.4300	1.7391	2.3194	3.5035	4.8833	6.0778	7.0447	7.9964	8.8916	9.4952	9.9131	10.2108	10.4401	10.6194	10.7469	10.8428	10.9306	10.9713

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Landings                        6.6170     1.4300     1.7391     2.3194     3.5035     4.8833
6.0778     7.0447     7.9964     8.8916     9.4952     9.9131    10.2108    10.4401    10.6194
10.7469    10.8428    10.9306    10.9713
FMort                           1.6003     0.1350     0.1350     0.1350     0.1350     0.1350
0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350     0.1350
0.1350     0.1350     0.1350     0.1350

Stock Numbers at Age
Age 1                        4083.9300 12417.3800 12558.8100 12336.3400 12195.0400 12012.8400
12179.7600 12217.6500 12242.8800 12388.5500 12421.2300 12376.0000 12291.8500 12532.5100
12143.3200 12483.8100 12208.9400 12469.8800 12089.6900
Age 2                        1707.4100  3322.3640 10152.7000 10268.2700 10086.6300  9971.1160
9821.9490  9958.5980  9989.3370 10010.1000 10129.3900 10155.9400 10119.1400 10050.5500 10246.9400
9929.0040 10207.0900  9982.7790 10195.3400
Age 3                        2111.8400  1360.2740  2709.1360  8278.1560  8373.2590  8224.9560
8130.7350  8008.8830  8120.6390  8145.3940  8162.6660  8259.7820  8281.0480  8251.3360  8195.7400
8355.5180  8096.5010  8323.0760  8140.2000
Age 4                        2088.9300  1477.4620  1085.5220  2161.8840  6605.8870  6681.9280
6563.2140  6488.2460  6391.0380  6480.4340  6500.2480  6513.7770  6591.1230  6608.3560  6584.5210
6539.8980  6667.6650  6460.9950  6641.6250
Age 5                        1357.4100  1125.7680  1113.9960   818.4941  1630.0890  4980.8150
5038.2250  4948.5970  4892.1270  4818.9570  4886.3420  4901.3330  4911.4410  4969.7610  4982.7430
4964.6430  4931.1400  5027.4520  4871.6050
Age 6                         637.8940   606.3292   815.1514   806.6140   592.6532  1180.2940
3606.4860  3647.9490  3583.1550  3542.3160  3489.2880  3538.0910  3548.9320  3556.2970  3598.7080
3607.9050  3594.6890  3570.5820  3640.3260
Age 7                         283.2270   273.4864   434.8943   584.6835   578.5711   425.1031
846.5946  2586.8190  2616.5300  2570.0800  2540.7810  2502.7720  2537.7190  2545.5600  2550.8310
2581.1770  2587.7370  2578.3970  2561.0230
Age 8                          61.3528   116.5031   195.6345   311.0961   418.2470   413.8816
304.1030   605.5906  1850.4120  1871.6980  1838.4360  1817.5090  1790.3670  1815.2730  1820.9740
1824.6850  1846.4230  1851.1640  1844.4530
Age 9                          47.8801    44.4976   115.3082   223.1524   377.4065   561.4424
667.9756   650.1713   891.7974  1882.3470  2392.9760  2747.1610  2982.7620  3100.2290  3210.1720
3294.0470  3322.1330  3358.0420  3407.7690
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