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# 9 Icelandic cod assesment

## 9.1 Overview

A formal HCR has been in place to set the TAC for this stock since 1994. The primary essence of the rule has been that the TAC for the next fishing year (starting 1. September in the assesment year and ending 31. August next year) is based on a multiplier on the reference biomass of four years and older in the assessment year ($B(4+)$).

The rule has gone through some amendments and revisions over time. The last significant change occurred in 2007, when the harvest rate multiplier upon which the TAC for the next fishing season was changed from 0.25 to 0.20. The current rule has in addition a catch stabilizer. When the SSB in the assessment year is estimated to be above $SSB\_trigger$ (220 kt) the decsison rule is:

$$TAC(y/y+1) = (0.20 * B\_(4+, y) + TAC(y-1/y))/2$$

The TAC for the current fishing year (2016/2017) based on last years assesment was 244 kt.

The results of this years assessment show that the spawning stock in 2017 is estimated to be 617 kt. The values estimated in recent years are higher than have been observed during the last five decades. The reference biomass $B_{4+}$ in 2017 is estimated to be 1356 kt, and has not been so high since the late 1970's. Fishing mortality, being 0.28 in 2016, has declined significantly in recent years and is presently the lowest observed. Year classes since the mid-1980s are estimated to be relatively stable but with the mean around 33% lower than observed in the period 1955 to 1985. Estimates of year classes 2014 and 2015 indicate that they are in the upper range of that observed in the recent decades, while the first estimate of the 2016 year class indicate that it is below average. That year class will not enter into the fishery until 2020.

Given the above HCR rule the catch for the coming fishing year (2017/2018) is 258 kt.

The input in the analytical assessments are catch at age 1955-2016 (age 3 to 14) and spring groundfish survey (SMB) indices at age from 1985-2017 and fall survey groundfish survey (SMH) indices at age from 1996-2016 (ages 1 to 10). The model framework has been the same since 2002, spring survey only used as input up to the 2009 assessment, both surveys since then.

## 9.2 Some elaborations

### 9.2.1 Data

The data used for assessing Icelandic cod are landings and catch-at-age composition since 1955 and indices from two standardized bottom trawl surveys. The spring survey (SMB) was instigated in 1985, the fall survey (SMH) in 1996.

The sampling programs i.e log books, surveys, sampling from landings etc. have been described in previous reports.

#### 9.2.1.1 Landings

Landings of Icelandic cod in 2016 are estimated to have been 251 kt of which 248 kt were taken by Icelandic fleet.

Historically the landings of bottom trawlers constituted a larger portion of the total catches than today, in some years prior to 1990 reaching 60% of the total landings. In the 1990's the landings from bottom trawlers declined significantly within a period of 5 years, and have been just above 40% of the total landings in the last decade. The share of long line has tripled over the last 20 years and is now on par

with bottom trawl. The share of gill net has over the same time period declined and is now only half of what it was in the 1980's.

The trend in landings in last two decades is largely a reflection of the TAC that is set for the fishing year (starting 1. September and ending 31. August). According to the HCR the catch for the fishing year 2015/2016 was supposed to be capped to 239 kt. Landings of the Icelandic fleet was 249 kt. Including additional landings of some 2 kt by the foreign fleet this amounts to 5.5% overshoot.

The estimates of landings for the current calendar year of 251 kt is based on the remainder of the quota from the current fishing year (2016/17) on 1. January 2017 (157 kt), the catch that is expected to be taken from 1. September to 31. December 2017 (91 kt) and the expected catch of the foreign fleet (3 kt).

Mean annual discard of cod over the period 2001-2012 is around 1% of landings in weight (Ólafur Pálsson et al 2013). The method used for deriving these estimates assumes that discarding only occurs as high grading.

#### 9.2.1.2 Catch in numbers and weight by age

*Catch in numbers by age*: The method for deriving the catch at age is based on 20 metiers: two areas (north and south), two seasons (January-May and June-December) and four fleets (bottom trawl, longline, hooks (jiggers), gillnet and danish seine).

The catch at age matrix is reasonably consistent (Table ), with CV estimated to be approximately 0.2 for age groups 4-10 based on a Shepherd-Nicholson model.

*Mean weight at age in the landings*: The mean weight age in the landings (Table  and Figure ) declined from 2001 to 2007, reaching then a historical low in many age groups. The weight at age have been increasing in recent years and are in 2016 around the average weights observed over the period from 1985 and close to the long term mean (1955-2016). The variation in the pattern of weight at age in the catches is in part a reflection of the variation in the weight in the stock as seen in the measurements from the spring survey (Table  and Figure ). The latest spring survey weight measurements (in 2017) are below average in younger ages but above average in older ages.

*Prediction of catch weights in 2017*: The reference biomass ($B_{4+}$) upon which the TAC in the fishing year is set (based on the HCR) is derived from population numbers and catch weights in the beginning of the assessment year. In recent years the estimates of mean weights in the landings of age groups 3-9 in the assessment years ($y$) have been based on a prediction from the spring survey weight measurements in that year using the slope ($\beta$) and the intercept ($\alpha$) from a linear relationship between survey and catch weights in preceding year ($y-1\}$. The same approach was used this year for predicting weight at age in the catches for 2017. I.e. the $\alpha$ and $\beta$ were estimated from :

$$cW\_(a, y-1) = \alpha + \beta * sW\_(a, y-1)$$

and the catch weights for 2017 then from:

$$cW\_(a, y) = alpha + beta * sW\_(a, y)$$

Based on this the mean weights at age in the catches in 2017 are predicted to be at or somewhat above the average (Figure ). For ages 10 and older the mean weights from the previous year are used.

#### 9.2.1.3 Surveys

*Length based indices*: The total biomass indices from the spring (SMB) and the fall (SMH) surveys (Figure ) indicate that the stock biomass has been increasing substantially in recent years and is in the last 5 years among highest since the start of the spring survey in 1985. The increase in biomass is most pronounced in larger fish.

*Age based indices*: Abundance indices by age from the spring and the fall surveys (Tables and ). Indices of older fish are all relatively high in recent years despite the indices of these year classes when younger are low or moderate in size (Figure ).

### 9.2.2 Assessment

*The framework*: The results from a statistical catch at age model (sometimes refer to as ADCAM) tuned with the spring and the fall survey have been used as the final point estimator upon which annual advice is based since 2002. In the framework catch at age are modeled and the fishing mortality can change gradually over time, constrained by a random walk. The survey residuals are modeled as multivariate normal distribution to account for potential survey "year effects" - this being a feature in place since 2002. In addition the framework has ... (low survey values) ..

*Diagnostics*: The tuning with both the spring and the fall survey show similar diagnostics as that observed in previous years (see Tables , and and Figure for the residuals). A negative residual block for spring survey indices age groups 2 to 5 in recent years may indicate that there may have been some change in catchability.

*Results*: The detailed result from the assessment are provided in Tables , and the stock summary in Table and Figure . The reference biomass is estimated to be 1356 kt in 2017 and the fishing mortality 0.28 in 2016.

*Alternatives*: Assessment based on tuning with the spring and the fall survey separately have in recent years shown that the fall survey gives a higher estimate than the spring survey. Tuning with spring survey only this year resulted in a reference biomass of 1272 kt in 2017 and a fishing mortality of 0.3 in 2016. An assessment based on the fall survey only gave reference biomass of 1348 kt in 2017 and fishing mortality of 0.28 in 2016.

*Comparison with last year*: The reference stock ($B_{4+}$) in 2016 is now estimated to be 1330 kt compared to 1243 kt last year. The SSB in 2016 is now estimated to be 473 kt compared to 469 kt estimated last year. Fishing mortality in 2015 is now estimated 0.27 compared to 0.27 estimated last year. Year classes 2013-2015 were estimated to be 117, 208 and 208 million in last years assessment and are now estimated to be 114, 191 and 188 millions.

## 9.3 HCR and reference points

The HCR upon which the TAC is set when the SSB in the assessment year is estimated to be above $SSB\_trigger$ (220 kt) is as follows:

$$TAC\_(y/y+1) = (0.20 * B\_(4+, y) + TAC\_(y-1/y))/2$$

In case the SSB is estimated to be below $SSB\_trigger = 220kt$ the 0.20 multiplier is reduced linearly. The $B\_(4+, y)$ refers to the reference biomass (4 years and older) in the beginning of the assessment year ($y$). The notation $y/y+1$ refers to the next fishing year (starting 1. September of the assessment year) and $y-1/y$ to the current fishing year (ending 31. August of the assessment year). The advice for the 2017/2018 fishing season is:

$$TAC\_(y/y+1) = (0.20 * 1356 + 244)/2 = 258kt$$

Although no prediction (besides catch weights in the assessment year) are needed to derive the advice, the basis as well as the calculation are provided (Table 14 and 15).

The rule was formally evaluated by ICES in 2009, but had been in place since the 2007/2008 fishing season. The evaluation showed that using the 0.20 multiplier would result in yield that was close to maximum (maximum yield when no catch stabilizer is used was estimated when applying a multiplier of around 0.22), while at the same time have a low probability that the stock would go below the $SSB\_trigger$. The results were robust to numerous stock-recruitment scenarios tested, including

assumption that future maximum mean recruitment would be around the mean observed since 1985 (Figure 8). All scenarios tested showed that there was very low probability that the stock would go below $B\_lim = B\_loss = 125kt$ (formally set in 2010) if the above rule is followed. ICES concluded that the HCR was in conformity both the ICES PA and MSY approach

Assessment errors ($CV = 0.15,\ \rho = 0.45$ (auto-correlation)) were included in the HCR evaluations. These errors were estimated from empirical retrospective pattern in the estimates of the reference biomass since the earliest available assessment in the 1970's. The distribution of the realized harvest rate when the HCR is followed showed that the 90% expected range are within a harvest rate of 0.15-0.27 (Figure ). The recent realized harvest rates are within the above range.

**Icelandic cod in Division Va. Estimateded catch in numbers by year and age in millions of fish in 1955-2016.**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 4.790 | 25.164 | 46.566 | 28.287 | 10.541 | 5.224 | 2.467 | 25.182 | 2.101 | 1.202 | 1.668 | 0.665 |
| 1956 | 6.709 | 17.265 | 31.030 | 27.793 | 14.389 | 4.261 | 3.429 | 2.128 | 16.820 | 1.552 | 1.522 | 1.545 |
| 1957 | 13.240 | 21.278 | 17.515 | 24.569 | 17.634 | 12.296 | 3.568 | 2.169 | 1.171 | 6.822 | 0.512 | 1.089 |
| 1958 | 25.237 | 30.742 | 14.298 | 10.859 | 15.997 | 15.822 | 12.021 | 2.003 | 2.125 | 0.771 | 3.508 | 0.723 |
| 1959 | 18.394 | 37.650 | 23.901 | 7.682 | 5.883 | 8.791 | 13.003 | 7.683 | 0.914 | 0.990 | 0.218 | 1.287 |
| 1960 | 14.830 | 28.642 | 27.968 | 14.120 | 8.387 | 6.089 | 6.393 | 11.600 | 3.526 | 0.692 | 0.183 | 0.510 |
| 1961 | 16.507 | 21.808 | 19.488 | 15.034 | 7.900 | 6.925 | 3.969 | 3.211 | 6.756 | 1.202 | 0.089 | 0.425 |
| 1962 | 13.514 | 28.526 | 18.924 | 14.650 | 12.045 | 4.276 | 8.809 | 2.664 | 1.883 | 2.988 | 0.405 | 0.324 |
| 1963 | 18.507 | 28.466 | 19.664 | 11.314 | 15.682 | 7.704 | 2.724 | 6.508 | 1.657 | 1.030 | 1.372 | 0.246 |
| 1964 | 19.287 | 28.845 | 18.712 | 11.620 | 7.936 | 18.032 | 5.040 | 1.437 | 2.670 | 0.655 | 0.370 | 1.025 |
| 1965 | 21.658 | 29.586 | 24.783 | 11.706 | 9.334 | 6.394 | 11.122 | 1.477 | 0.823 | 0.489 | 0.118 | 0.489 |
| 1966 | 17.910 | 30.649 | 20.006 | 13.872 | 5.942 | 7.586 | 2.320 | 5.583 | 0.407 | 0.363 | 0.299 | 0.311 |
| 1967 | 25.945 | 27.941 | 24.322 | 11.320 | 8.751 | 2.595 | 5.490 | 1.392 | 1.998 | 0.109 | 0.030 | 0.106 |
| 1968 | 11.933 | 47.311 | 22.344 | 16.277 | 15.590 | 7.059 | 1.571 | 2.506 | 0.512 | 0.659 | 0.047 | 0.098 |
| 1969 | 11.149 | 23.925 | 45.445 | 17.397 | 12.559 | 14.811 | 1.590 | 0.475 | 0.340 | 0.064 | 0.024 | 0.021 |
| 1970 | 9.876 | 47.210 | 23.607 | 25.451 | 15.196 | 12.261 | 14.469 | 0.567 | 0.207 | 0.147 | 0.035 | 0.050 |
| 1971 | 13.060 | 35.856 | 45.577 | 21.135 | 17.340 | 10.924 | 6.001 | 4.210 | 0.237 | 0.069 | 0.038 | 0.020 |
| 1972 | 8.973 | 29.574 | 30.918 | 22.855 | 11.097 | 9.784 | 10.538 | 3.938 | 1.242 | 0.119 | 0.031 | 0.001 |
| 1973 | 36.538 | 25.542 | 27.391 | 17.045 | 12.721 | 3.685 | 4.718 | 5.809 | 1.134 | 0.282 | 0.007 | 0.001 |
| 1974 | 14.846 | 61.826 | 21.824 | 14.413 | 8.974 | 6.216 | 1.647 | 2.530 | 1.765 | 0.334 | 0.062 | 0.028 |
| 1975 | 29.301 | 29.489 | 44.138 | 12.088 | 9.628 | 3.691 | 2.051 | 0.752 | 0.891 | 0.416 | 0.060 | 0.046 |
| 1976 | 23.578 | 39.790 | 21.092 | 24.395 | 5.803 | 5.343 | 1.297 | 0.633 | 0.205 | 0.155 | 0.065 | 0.029 |
| 1977 | 2.614 | 42.659 | 32.465 | 12.162 | 13.017 | 2.809 | 1.773 | 0.421 | 0.086 | 0.024 | 0.006 | 0.002 |
| 1978 | 5.999 | 16.287 | 43.931 | 17.626 | 8.729 | 4.119 | 0.978 | 0.348 | 0.119 | 0.048 | 0.015 | 0.027 |
| 1979 | 7.186 | 28.427 | 13.772 | 34.443 | 14.130 | 4.426 | 1.432 | 0.350 | 0.168 | 0.043 | 0.024 | 0.004 |
| 1980 | 4.348 | 28.530 | 32.500 | 15.119 | 27.090 | 7.847 | 2.228 | 0.646 | 0.246 | 0.099 | 0.025 | 0.004 |
| 1981 | 2.118 | 13.297 | 39.195 | 23.247 | 12.710 | 26.455 | 4.804 | 1.677 | 0.582 | 0.228 | 0.053 | 0.068 |
| 1982 | 3.285 | 20.812 | 24.462 | 28.351 | 14.012 | 7.666 | 11.517 | 1.912 | 0.327 | 0.094 | 0.043 | 0.011 |
| 1983 | 3.554 | 10.910 | 24.305 | 18.944 | 17.382 | 8.381 | 2.054 | 2.733 | 0.514 | 0.215 | 0.064 | 0.037 |
| 1984 | 6.750 | 31.553 | 19.420 | 15.326 | 8.082 | 7.336 | 2.680 | 0.512 | 0.538 | 0.195 | 0.090 | 0.036 |
| 1985 | 6.457 | 24.552 | 35.392 | 18.267 | 8.711 | 4.201 | 2.264 | 1.063 | 0.217 | 0.233 | 0.102 | 0.038 |
| 1986 | 20.642 | 20.330 | 26.644 | 30.839 | 11.413 | 4.441 | 1.771 | 0.805 | 0.392 | 0.103 | 0.076 | 0.044 |
| 1987 | 11.002 | 62.130 | 27.192 | 15.127 | 15.695 | 4.159 | 1.463 | 0.592 | 0.253 | 0.142 | 0.046 | 0.058 |
| 1988 | 6.713 | 39.323 | 55.895 | 18.663 | 6.399 | 5.877 | 1.345 | 0.455 | 0.305 | 0.157 | 0.114 | 0.025 |
| 1989 | 2.605 | 27.983 | 50.059 | 31.455 | 6.010 | 1.915 | 0.881 | 0.225 | 0.107 | 0.086 | 0.038 | 0.005 |
| 1990 | 5.785 | 12.313 | 27.179 | 44.534 | 17.037 | 2.573 | 0.609 | 0.322 | 0.118 | 0.050 | 0.015 | 0.020 |
| 1991 | 8.554 | 25.131 | 15.491 | 21.514 | 25.038 | 6.364 | 0.903 | 0.243 | 0.125 | 0.063 | 0.011 | 0.012 |
| 1992 | 12.217 | 21.708 | 26.524 | 11.413 | 10.073 | 8.304 | 2.006 | 0.257 | 0.046 | 0.032 | 0.009 | 0.008 |
| 1993 | 20.500 | 33.078 | 15.195 | 13.281 | 3.583 | 2.785 | 2.707 | 1.181 | 0.180 | 0.034 | 0.011 | 0.013 |
| 1994 | 6.160 | 24.142 | 19.666 | 6.968 | 4.393 | 1.257 | 0.599 | 0.508 | 0.283 | 0.049 | 0.018 | 0.006 |
| 1995 | 10.770 | 9.103 | 16.829 | 13.066 | 4.115 | 1.596 | 0.313 | 0.184 | 0.156 | 0.141 | 0.029 | 0.008 |
| 1996 | 5.356 | 14.886 | 7.372 | 12.307 | 9.429 | 2.157 | 0.837 | 0.208 | 0.076 | 0.065 | 0.055 | 0.005 |
| 1997 | 1.722 | 16.442 | 17.298 | 6.711 | 7.379 | 5.958 | 1.147 | 0.493 | 0.126 | 0.028 | 0.037 | 0.021 |
| 1998 | 3.458 | 7.707 | 25.394 | 20.167 | 5.893 | 3.856 | 2.951 | 0.500 | 0.196 | 0.055 | 0.033 | 0.013 |
| 1999 | 2.525 | 19.554 | 15.226 | 24.622 | 12.966 | 2.795 | 1.489 | 0.748 | 0.140 | 0.046 | 0.010 | 0.005 |
| 2000 | 10.493 | 6.581 | 29.080 | 11.227 | 11.390 | 5.714 | 1.104 | 0.567 | 0.314 | 0.074 | 0.022 | 0.006 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 13.566 | 25.935 | 9.107 | 20.183 | 5.848 | 3.763 | 2.029 | 0.508 | 0.199 | 0.136 | 0.013 | 0.031 |
| 2002 | 5.992 | 17.762 | 24.056 | 7.168 | 9.430 | 2.453 | 1.556 | 0.739 | 0.150 | 0.058 | 0.041 | 0.004 |
| 2003 | 5.489 | 16.312 | 22.045 | 16.629 | 4.840 | 4.933 | 1.201 | 0.507 | 0.211 | 0.046 | 0.026 | 0.033 |
| 2004 | 1.784 | 17.958 | 24.043 | 17.903 | 10.167 | 2.881 | 1.977 | 0.500 | 0.162 | 0.087 | 0.019 | 0.008 |
| 2005 | 5.236 | 5.283 | 26.129 | 16.952 | 8.577 | 4.901 | 1.295 | 0.790 | 0.217 | 0.096 | 0.037 | 0.005 |
| 2006 | 3.456 | 13.066 | 8.784 | 21.926 | 10.577 | 4.703 | 2.170 | 0.472 | 0.241 | 0.040 | 0.016 | 0.010 |
| 2007 | 2.034 | 11.540 | 15.826 | 8.563 | 9.904 | 5.730 | 2.299 | 1.150 | 0.332 | 0.088 | 0.067 | 0.006 |
| 2008 | 3.109 | 5.118 | 12.808 | 11.597 | 5.141 | 4.700 | 2.138 | 0.881 | 0.279 | 0.069 | 0.044 | 0.004 |
| 2009 | 3.448 | 7.892 | 9.571 | 17.860 | 10.474 | 3.888 | 2.306 | 0.744 | 0.316 | 0.089 | 0.023 | 0.012 |
| 2010 | 3.498 | 7.673 | 9.478 | 8.407 | 10.953 | 5.561 | 1.567 | 0.927 | 0.297 | 0.145 | 0.063 | 0.017 |
| 2011 | 4.014 | 7.832 | 10.522 | 10.788 | 6.281 | 6.300 | 2.418 | 0.678 | 0.419 | 0.135 | 0.039 | 0.016 |
| 2012 | 4.072 | 11.276 | 10.795 | 9.494 | 8.896 | 5.011 | 3.202 | 1.148 | 0.291 | 0.225 | 0.079 | 0.026 |
| 2013 | 5.780 | 12.243 | 15.364 | 11.413 | 7.589 | 5.789 | 2.571 | 1.832 | 0.653 | 0.209 | 0.146 | 0.036 |
| 2014 | 4.623 | 8.378 | 14.913 | 13.288 | 8.427 | 4.928 | 2.814 | 1.393 | 0.964 | 0.376 | 0.127 | 0.104 |
| 2015 | 5.225 | 13.346 | 10.372 | 13.887 | 9.407 | 5.611 | 2.440 | 1.561 | 0.950 | 0.407 | 0.125 | 0.037 |
| 2016 | 2.872 | 10.847 | 12.115 | 10.418 | 13.097 | 7.355 | 3.229 | 1.626 | 0.864 | 0.543 | 0.188 | 0.057 |

**Icelandic cod in Division Va. Estimated mean weight at age in the landings (kg) in period the 1955-2016. The weights for age groups 3 to 9 in 2017 are based on predictions from the 2017 spring survey measurements. The weights in the catches are used to calculate the reference biomass ($B\_(4+)$).**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 0.827 | 1.307 | 2.157 | 3.617 | 4.638 | 5.657 | 6.635 | 6.168 | 8.746 | 8.829 | 10.086 | 14.584 |
| 1956 | 1.080 | 1.600 | 2.190 | 3.280 | 4.650 | 5.630 | 6.180 | 6.970 | 6.830 | 9.290 | 10.965 | 12.954 |
| 1957 | 1.140 | 1.710 | 2.520 | 3.200 | 4.560 | 5.960 | 7.170 | 7.260 | 8.300 | 8.290 | 10.350 | 13.174 |
| 1958 | 1.210 | 1.810 | 3.120 | 4.510 | 5.000 | 5.940 | 6.640 | 8.290 | 8.510 | 8.840 | 9.360 | 13.097 |
| 1959 | 1.110 | 1.950 | 2.930 | 4.520 | 5.520 | 6.170 | 6.610 | 7.130 | 8.510 | 8.670 | 9.980 | 11.276 |
| 1960 | 1.060 | 1.720 | 2.920 | 4.640 | 5.660 | 6.550 | 6.910 | 7.140 | 7.970 | 10.240 | 10.100 | 12.871 |
| 1961 | 1.020 | 1.670 | 2.700 | 4.330 | 5.530 | 6.310 | 6.930 | 7.310 | 7.500 | 8.510 | 9.840 | 14.550 |
| 1962 | 0.990 | 1.610 | 2.610 | 3.900 | 5.720 | 6.660 | 6.750 | 7.060 | 7.540 | 8.280 | 10.900 | 12.826 |
| 1963 | 1.250 | 1.650 | 2.640 | 3.800 | 5.110 | 6.920 | 7.840 | 7.610 | 8.230 | 9.100 | 9.920 | 11.553 |
| 1964 | 1.210 | 1.750 | 2.640 | 4.020 | 5.450 | 6.460 | 8.000 | 9.940 | 9.210 | 10.940 | 12.670 | 15.900 |
| 1965 | 1.020 | 1.530 | 2.570 | 4.090 | 5.410 | 6.400 | 7.120 | 8.600 | 12.310 | 10.460 | 10.190 | 17.220 |
| 1966 | 1.170 | 1.680 | 2.590 | 4.180 | 5.730 | 6.900 | 7.830 | 8.580 | 9.090 | 14.230 | 14.090 | 17.924 |
| 1967 | 1.120 | 1.820 | 2.660 | 4.067 | 5.560 | 7.790 | 7.840 | 8.430 | 9.090 | 10.090 | 14.240 | 16.412 |
| 1968 | 1.170 | 1.590 | 2.680 | 3.930 | 5.040 | 5.910 | 7.510 | 8.480 | 10.750 | 11.580 | 14.640 | 16.011 |
| 1969 | 1.100 | 1.810 | 2.480 | 3.770 | 5.040 | 5.860 | 7.000 | 8.350 | 8.720 | 10.080 | 11.430 | 13.144 |
| 1970 | 0.990 | 1.450 | 2.440 | 3.770 | 4.860 | 5.590 | 6.260 | 8.370 | 10.490 | 12.310 | 14.590 | 21.777 |
| 1971 | 1.090 | 1.570 | 2.310 | 2.980 | 4.930 | 5.150 | 5.580 | 6.300 | 8.530 | 11.240 | 14.740 | 17.130 |
| 1972 | 0.980 | 1.460 | 2.210 | 3.250 | 4.330 | 5.610 | 6.040 | 6.100 | 6.870 | 8.950 | 11.720 | 16.000 |
| 1973 | 1.030 | 1.420 | 2.470 | 3.600 | 4.900 | 6.110 | 6.670 | 6.750 | 7.430 | 7.950 | 10.170 | 17.000 |
| 1974 | 1.050 | 1.710 | 2.430 | 3.820 | 5.240 | 6.660 | 7.150 | 7.760 | 8.190 | 9.780 | 12.380 | 14.700 |
| 1975 | 1.100 | 1.770 | 2.780 | 3.760 | 5.450 | 6.690 | 7.570 | 8.580 | 8.810 | 9.780 | 10.090 | 11.000 |
| 1976 | 1.350 | 1.780 | 2.650 | 4.100 | 5.070 | 6.730 | 8.250 | 9.610 | 11.540 | 11.430 | 14.060 | 16.180 |
| 1977 | 1.259 | 1.911 | 2.856 | 4.069 | 5.777 | 6.636 | 7.685 | 9.730 | 11.703 | 14.394 | 17.456 | 24.116 |
| 1978 | 1.289 | 1.833 | 2.929 | 3.955 | 5.726 | 6.806 | 9.041 | 10.865 | 13.068 | 11.982 | 19.062 | 21.284 |
| 1979 | 1.408 | 1.956 | 2.642 | 3.999 | 5.548 | 6.754 | 8.299 | 9.312 | 13.130 | 13.418 | 13.540 | 20.072 |
| 1980 | 1.392 | 1.862 | 2.733 | 3.768 | 5.259 | 6.981 | 8.037 | 10.731 | 12.301 | 17.281 | 14.893 | 19.069 |
| 1981 | 1.180 | 1.651 | 2.260 | 3.293 | 4.483 | 5.821 | 7.739 | 9.422 | 11.374 | 12.784 | 12.514 | 19.069 |
| 1982 | 1.006 | 1.550 | 2.246 | 3.104 | 4.258 | 5.386 | 6.682 | 9.141 | 11.963 | 14.226 | 17.287 | 16.590 |
| 1983 | 1.095 | 1.599 | 2.275 | 3.021 | 4.096 | 5.481 | 7.049 | 8.128 | 11.009 | 13.972 | 15.882 | 18.498 |
| 1984 | 1.288 | 1.725 | 2.596 | 3.581 | 4.371 | 5.798 | 7.456 | 9.851 | 11.052 | 14.338 | 15.273 | 16.660 |
| 1985 | 1.407 | 1.971 | 2.576 | 3.650 | 4.976 | 6.372 | 8.207 | 10.320 | 12.197 | 14.683 | 16.175 | 19.050 |
| 1986 | 1.459 | 1.961 | 2.844 | 3.593 | 4.635 | 6.155 | 7.503 | 9.084 | 10.356 | 15.283 | 14.540 | 15.017 |
| 1987 | 1.316 | 1.956 | 2.686 | 3.894 | 4.716 | 6.257 | 7.368 | 9.243 | 10.697 | 10.622 | 15.894 | 12.592 |
| 1988 | 1.438 | 1.805 | 2.576 | 3.519 | 4.930 | 6.001 | 7.144 | 8.822 | 9.977 | 11.732 | 14.156 | 13.042 |
| 1989 | 1.186 | 1.813 | 2.590 | 3.915 | 5.210 | 6.892 | 8.035 | 9.831 | 11.986 | 10.003 | 12.611 | 16.045 |
| 1990 | 1.290 | 1.704 | 2.383 | 3.034 | 4.624 | 6.521 | 8.888 | 10.592 | 10.993 | 14.570 | 15.732 | 17.290 |
| 1991 | 1.309 | 1.899 | 2.475 | 3.159 | 3.792 | 5.680 | 7.242 | 9.804 | 9.754 | 14.344 | 14.172 | 20.200 |
| 1992 | 1.289 | 1.768 | 2.469 | 3.292 | 4.394 | 5.582 | 6.830 | 8.127 | 12.679 | 13.410 | 15.715 | 11.267 |
| 1993 | 1.392 | 1.887 | 2.772 | 3.762 | 4.930 | 6.054 | 7.450 | 8.641 | 10.901 | 12.517 | 14.742 | 16.874 |
| 1994 | 1.443 | 2.063 | 2.562 | 3.659 | 5.117 | 6.262 | 7.719 | 8.896 | 10.847 | 12.874 | 14.742 | 17.470 |
| 1995 | 1.348 | 1.959 | 2.920 | 3.625 | 5.176 | 6.416 | 7.916 | 10.273 | 11.022 | 11.407 | 13.098 | 15.182 |
| 1996 | 1.457 | 1.930 | 3.132 | 4.141 | 4.922 | 6.009 | 7.406 | 9.772 | 10.539 | 13.503 | 13.689 | 16.194 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1997 | 1.484 | 1.877 | 2.878 | 4.028 | 5.402 | 6.386 | 7.344 | 8.537 | 10.797 | 11.533 | 10.428 | 12.788 |
| 1998 | 1.230 | 1.750 | 2.458 | 3.559 | 5.213 | 7.737 | 7.837 | 9.304 | 10.759 | 14.903 | 16.651 | 18.666 |
| 1999 | 1.241 | 1.716 | 2.426 | 3.443 | 4.720 | 6.352 | 8.730 | 9.946 | 11.088 | 12.535 | 14.995 | 15.151 |
| 2000 | 1.308 | 1.782 | 2.330 | 3.252 | 4.690 | 5.894 | 7.809 | 9.203 | 10.240 | 11.172 | 13.172 | 17.442 |
| 2001 | 1.486 | 2.021 | 2.631 | 3.364 | 4.558 | 6.190 | 7.124 | 8.445 | 9.313 | 9.569 | 10.234 | 9.505 |
| 2002 | 1.308 | 1.946 | 2.662 | 3.636 | 4.550 | 5.927 | 7.082 | 8.100 | 9.275 | 11.660 | 11.220 | 14.025 |
| 2003 | 1.350 | 1.866 | 2.459 | 3.391 | 4.380 | 4.756 | 6.141 | 7.138 | 9.580 | 10.260 | 11.479 | 10.720 |
| 2004 | 1.139 | 1.754 | 2.413 | 3.372 | 4.288 | 5.185 | 5.740 | 7.376 | 10.037 | 10.322 | 12.428 | 11.445 |
| 2005 | 1.195 | 1.734 | 2.419 | 3.392 | 4.292 | 5.057 | 6.232 | 6.123 | 7.961 | 10.067 | 12.776 | 13.717 |
| 2006 | 1.089 | 1.625 | 2.210 | 3.059 | 4.270 | 4.983 | 5.290 | 6.040 | 8.448 | 11.155 | 12.611 | 15.382 |
| 2007 | 1.062 | 1.593 | 2.179 | 2.791 | 3.865 | 5.162 | 5.876 | 6.407 | 7.186 | 9.519 | 10.408 | 10.532 |
| 2008 | 1.100 | 1.600 | 2.369 | 3.147 | 3.996 | 5.278 | 6.495 | 7.383 | 7.822 | 10.391 | 11.562 | 18.087 |
| 2009 | 1.096 | 1.668 | 2.210 | 3.190 | 4.068 | 5.035 | 6.663 | 8.371 | 9.520 | 11.205 | 11.753 | 15.036 |
| 2010 | 1.100 | 1.827 | 2.360 | 3.222 | 4.485 | 5.471 | 6.748 | 8.038 | 8.975 | 10.395 | 11.629 | 12.222 |
| 2011 | 1.111 | 1.664 | 2.517 | 3.452 | 4.412 | 5.792 | 6.531 | 7.826 | 8.810 | 9.697 | 12.942 | 11.644 |
| 2012 | 1.184 | 1.631 | 2.452 | 3.760 | 4.717 | 5.934 | 7.368 | 8.011 | 9.098 | 10.718 | 12.037 | 11.596 |
| 2013 | 1.132 | 1.743 | 2.450 | 3.611 | 4.936 | 6.126 | 7.368 | 8.137 | 9.173 | 10.121 | 10.422 | 12.703 |
| 2014 | 1.117 | 1.740 | 2.521 | 3.515 | 4.675 | 6.158 | 7.486 | 8.583 | 8.962 | 10.516 | 10.281 | 12.324 |
| 2015 | 1.196 | 1.645 | 2.666 | 3.600 | 4.643 | 5.920 | 7.582 | 8.600 | 9.686 | 11.206 | 11.329 | 10.361 |
| 2016 | 1.099 | 1.786 | 2.508 | 3.804 | 4.617 | 5.944 | 7.163 | 8.487 | 10.113 | 10.695 | 11.365 | 13.904 |
| 2017 | 1.296 | 2.013 | 2.646 | 3.348 | 5.531 | 6.682 | 7.689 | 8.487 | 10.113 | 10.695 | 11.365 | 13.904 |

**Icelandic cod in Division Va. Estimated weight at age in the spawning stock (kg) in period the 1955-2018. These weights are used to calculate the spawning stock biomass (SSB).**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 0.645 | 1.019 | 1.833 | 3.183 | 4.128 | 5.657 | 6.635 | 6.168 | 8.746 | 8.829 | 10.086 | 14.584 |
| 1956 | 0.645 | 1.248 | 1.862 | 2.886 | 4.138 | 5.630 | 6.180 | 6.970 | 6.830 | 9.290 | 10.965 | 12.954 |
| 1957 | 0.645 | 1.334 | 2.142 | 2.816 | 4.058 | 5.960 | 7.170 | 7.260 | 8.300 | 8.290 | 10.350 | 13.174 |
| 1958 | 0.645 | 1.412 | 2.652 | 3.969 | 4.450 | 5.940 | 6.640 | 8.290 | 8.510 | 8.840 | 9.360 | 13.097 |
| 1959 | 0.645 | 1.521 | 2.490 | 3.978 | 4.913 | 6.170 | 6.610 | 7.130 | 8.510 | 8.670 | 9.980 | 11.276 |
| 1960 | 0.645 | 1.342 | 2.482 | 4.083 | 5.037 | 6.550 | 6.910 | 7.140 | 7.970 | 10.240 | 10.100 | 12.871 |
| 1961 | 0.645 | 1.303 | 2.295 | 3.810 | 4.922 | 6.310 | 6.930 | 7.310 | 0.750 | 8.510 | 9.840 | 14.550 |
| 1962 | 0.645 | 1.256 | 2.218 | 3.432 | 5.091 | 6.660 | 6.750 | 7.060 | 7.540 | 8.280 | 10.900 | 12.826 |
| 1963 | 0.645 | 1.287 | 2.244 | 3.344 | 4.548 | 6.920 | 7.840 | 7.610 | 8.230 | 9.100 | 9.920 | 11.553 |
| 1964 | 0.645 | 1.365 | 2.244 | 3.538 | 4.850 | 6.460 | 8.000 | 9.940 | 9.210 | 10.940 | 12.670 | 15.900 |
| 1965 | 0.645 | 1.193 | 2.184 | 3.599 | 4.815 | 6.400 | 7.120 | 8.600 | 12.310 | 10.460 | 10.190 | 17.220 |
| 1966 | 0.645 | 1.310 | 2.202 | 3.678 | 5.100 | 6.900 | 7.830 | 8.580 | 9.090 | 14.230 | 14.090 | 17.924 |
| 1967 | 0.645 | 1.420 | 2.261 | 3.579 | 4.948 | 7.790 | 7.840 | 8.430 | 9.090 | 10.090 | 14.240 | 16.412 |
| 1968 | 0.645 | 1.240 | 2.278 | 3.458 | 4.486 | 5.910 | 7.510 | 8.480 | 10.750 | 11.580 | 14.640 | 16.011 |
| 1969 | 0.645 | 1.412 | 2.108 | 3.318 | 4.486 | 5.860 | 7.000 | 8.350 | 8.720 | 10.080 | 11.430 | 13.144 |
| 1970 | 0.645 | 1.131 | 2.074 | 3.318 | 4.325 | 5.590 | 6.260 | 8.370 | 10.490 | 12.310 | 14.590 | 21.777 |
| 1971 | 0.645 | 1.225 | 1.964 | 2.622 | 4.388 | 5.150 | 5.580 | 6.300 | 8.530 | 11.240 | 14.740 | 17.130 |
| 1972 | 0.645 | 1.139 | 1.878 | 2.860 | 3.854 | 5.610 | 6.040 | 6.100 | 6.870 | 8.950 | 11.720 | 16.000 |
| 1973 | 0.645 | 1.108 | 2.100 | 3.168 | 4.361 | 6.110 | 6.670 | 6.750 | 7.430 | 7.950 | 10.170 | 17.000 |
| 1974 | 0.645 | 1.334 | 2.066 | 3.362 | 4.664 | 6.660 | 7.150 | 7.760 | 8.190 | 9.780 | 12.380 | 14.700 |
| 1975 | 0.645 | 1.381 | 2.363 | 3.309 | 4.850 | 6.690 | 7.570 | 8.580 | 8.810 | 9.780 | 10.090 | 11.000 |
| 1976 | 0.645 | 1.388 | 2.252 | 3.608 | 4.512 | 6.730 | 8.250 | 9.610 | 11.540 | 11.430 | 14.060 | 16.180 |
| 1977 | 0.645 | 1.491 | 2.428 | 3.581 | 5.142 | 6.636 | 7.685 | 9.730 | 11.703 | 14.394 | 17.456 | 24.116 |
| 1978 | 0.645 | 1.430 | 2.490 | 3.480 | 5.096 | 6.806 | 9.041 | 10.865 | 13.068 | 11.982 | 19.062 | 21.284 |
| 1979 | 0.645 | 1.526 | 2.246 | 3.519 | 4.938 | 6.754 | 8.299 | 9.312 | 13.130 | 13.418 | 13.540 | 20.072 |
| 1980 | 0.645 | 1.452 | 2.323 | 3.316 | 4.681 | 6.981 | 8.037 | 10.731 | 12.301 | 17.281 | 14.893 | 19.069 |
| 1981 | 0.645 | 1.288 | 1.921 | 2.898 | 3.990 | 5.821 | 7.739 | 9.422 | 11.374 | 12.784 | 12.514 | 19.069 |
| 1982 | 0.645 | 1.209 | 1.909 | 2.732 | 3.790 | 5.386 | 6.682 | 9.141 | 11.963 | 14.226 | 17.287 | 16.590 |
| 1983 | 0.645 | 1.247 | 1.934 | 2.658 | 3.645 | 5.481 | 7.049 | 8.128 | 11.009 | 13.972 | 15.882 | 18.498 |
| 1984 | 0.645 | 1.346 | 2.207 | 3.151 | 3.890 | 5.798 | 7.456 | 9.851 | 11.052 | 14.338 | 15.273 | 16.660 |
| 1985 | 1.309 | 1.397 | 1.764 | 2.737 | 3.482 | 4.764 | 7.311 | 10.320 | 12.197 | 14.683 | 16.175 | 19.050 |
| 1986 | 1.309 | 1.609 | 2.913 | 3.278 | 4.592 | 5.808 | 7.207 | 9.084 | 10.356 | 15.283 | 14.540 | 15.017 |
| 1987 | 1.714 | 1.596 | 2.437 | 3.531 | 4.888 | 6.414 | 7.509 | 9.243 | 10.697 | 10.622 | 15.894 | 12.592 |
| 1988 | 0.929 | 1.483 | 2.278 | 3.286 | 4.424 | 4.681 | 8.159 | 8.822 | 9.977 | 11.732 | 14.156 | 13.042 |
| 1989 | 0.821 | 1.523 | 2.361 | 3.425 | 4.702 | 7.282 | 8.453 | 9.831 | 11.986 | 10.003 | 12.611 | 16.045 |
| 1990 | 0.731 | 1.042 | 2.196 | 2.839 | 4.368 | 6.182 | 8.934 | 10.592 | 10.993 | 14.570 | 15.732 | 17.290 |
| 1991 | 0.114 | 1.286 | 2.066 | 2.797 | 3.476 | 6.011 | 8.834 | 9.804 | 9.754 | 14.344 | 14.172 | 20.200 |
| 1992 | 0.448 | 1.347 | 2.115 | 3.085 | 3.861 | 5.198 | 7.437 | 8.127 | 12.679 | 13.410 | 15.715 | 11.267 |
| 1993 | 0.773 | 1.374 | 2.316 | 3.276 | 4.179 | 5.730 | 6.442 | 8.641 | 10.901 | 12.517 | 14.742 | 16.874 |
| 1994 | 1.618 | 1.733 | 2.259 | 3.384 | 4.564 | 6.471 | 9.805 | 8.896 | 10.847 | 12.874 | 14.742 | 17.470 |
| 1995 | 0.514 | 1.639 | 2.354 | 3.197 | 4.492 | 5.544 | 8.582 | 10.273 | 11.022 | 11.407 | 13.098 | 15.182 |
| 1996 | 0.542 | 1.756 | 2.490 | 3.530 | 4.251 | 5.621 | 8.264 | 9.772 | 10.539 | 13.503 | 13.689 | 16.193 |
| 1997 | 1.111 | 1.346 | 2.267 | 3.740 | 5.417 | 5.963 | 6.966 | 8.537 | 10.797 | 11.533 | 10.428 | 12.788 |
| 1998 | 1.111 | 1.605 | 2.263 | 3.263 | 4.462 | 5.760 | 6.795 | 9.304 | 10.759 | 14.903 | 16.651 | 18.666 |
| 1999 | 1.311 | 1.471 | 1.936 | 2.999 | 3.968 | 5.132 | 6.523 | 9.946 | 11.088 | 12.535 | 14.995 | 15.151 |
| 2000 | 0.497 | 1.355 | 1.916 | 2.881 | 4.318 | 5.574 | 8.466 | 9.203 | 10.240 | 11.172 | 13.172 | 17.442 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 0.816 | 1.583 | 2.080 | 2.676 | 4.112 | 6.237 | 6.927 | 9.055 | 8.769 | 9.526 | 11.210 | 13.874 |
| 2002 | 0.782 | 1.591 | 2.260 | 3.120 | 3.991 | 5.991 | 9.229 | 9.002 | 10.422 | 13.402 | 9.008 | 16.893 |
| 2003 | 1.150 | 1.326 | 2.241 | 3.051 | 4.229 | 5.051 | 6.824 | 7.819 | 8.802 | 10.712 | 12.152 | 13.797 |
| 2004 | 1.150 | 1.441 | 2.092 | 3.023 | 3.702 | 5.254 | 5.540 | 7.397 | 10.808 | 11.569 | 13.767 | 12.955 |
| 2005 | 0.648 | 1.123 | 1.908 | 2.979 | 3.901 | 4.790 | 7.239 | 5.495 | 7.211 | 9.909 | 12.944 | 18.151 |
| 2006 | 0.907 | 1.407 | 2.016 | 2.913 | 4.352 | 5.057 | 6.473 | 5.769 | 6.258 | 5.688 | 7.301 | 15.412 |
| 2007 | 1.439 | 1.261 | 2.023 | 2.640 | 4.116 | 5.697 | 6.632 | 6.481 | 7.142 | 6.530 | 9.724 | 10.143 |
| 2008 | 0.912 | 1.845 | 2.232 | 2.911 | 3.897 | 5.400 | 6.928 | 7.648 | 8.282 | 11.181 | 14.266 | 17.320 |
| 2009 | 0.644 | 1.465 | 2.041 | 2.887 | 3.943 | 4.924 | 7.044 | 8.505 | 10.126 | 12.108 | 12.471 | 15.264 |
| 2010 | 0.644 | 1.590 | 2.154 | 3.149 | 4.207 | 5.207 | 6.460 | 7.945 | 8.913 | 10.090 | 10.417 | 13.489 |
| 2011 | 0.794 | 2.467 | 2.666 | 3.216 | 4.546 | 5.989 | 6.851 | 7.850 | 8.810 | 9.797 | 13.534 | 13.033 |
| 2012 | 1.404 | 1.702 | 2.606 | 3.717 | 4.516 | 6.016 | 8.039 | 8.358 | 9.543 | 10.916 | 10.884 | 11.758 |
| 2013 | 0.944 | 2.323 | 2.991 | 3.834 | 5.207 | 6.532 | 8.260 | 8.415 | 9.336 | 9.926 | 11.195 | 12.691 |
| 2014 | 0.944 | 1.332 | 2.549 | 3.316 | 4.459 | 6.390 | 8.179 | 8.413 | 9.713 | 10.513 | 11.437 | 12.979 |
| 2015 | 0.704 | 1.043 | 3.320 | 3.836 | 4.895 | 6.218 | 8.677 | 9.694 | 9.688 | 11.212 | 11.334 | 10.356 |
| 2016 | 0.972 | 2.247 | 3.042 | 4.213 | 4.614 | 6.000 | 7.351 | 9.731 | 10.006 | 10.522 | 11.466 | 13.758 |
| 2017 | 1.773 | 2.582 | 3.513 | 3.935 | 5.697 | 6.715 | 7.636 | 9.698 | 9.973 | 10.487 | 11.428 | 13.712 |

**Table 9.1. Icelandic cod in Division Va. Estimated maturity at age in period the 1955-2017.**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 0.019 | 0.022 | 0.033 | 0.181 | 0.577 | 0.782 | 0.834 | 0.960 | 1.000 | 1.000 | 1.000 | 1 |
| 1956 | 0.019 | 0.025 | 0.033 | 0.111 | 0.577 | 0.782 | 0.818 | 0.980 | 0.980 | 1.000 | 1.000 | 1 |
| 1957 | 0.019 | 0.026 | 0.043 | 0.100 | 0.549 | 0.801 | 0.842 | 0.990 | 1.000 | 1.000 | 1.000 | 1 |
| 1958 | 0.019 | 0.028 | 0.086 | 0.520 | 0.682 | 0.801 | 0.834 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1959 | 0.019 | 0.029 | 0.070 | 0.535 | 0.772 | 0.818 | 0.834 | 0.990 | 1.000 | 1.000 | 1.000 | 1 |
| 1960 | 0.019 | 0.026 | 0.066 | 0.577 | 0.782 | 0.826 | 0.834 | 0.990 | 1.000 | 1.000 | 1.000 | 1 |
| 1961 | 0.019 | 0.025 | 0.053 | 0.450 | 0.772 | 0.818 | 0.834 | 0.990 | 0.990 | 1.000 | 1.000 | 1 |
| 1962 | 0.019 | 0.025 | 0.048 | 0.281 | 0.791 | 0.834 | 0.834 | 0.990 | 0.990 | 1.000 | 1.000 | 1 |
| 1963 | 0.019 | 0.025 | 0.048 | 0.237 | 0.706 | 0.834 | 0.849 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1964 | 0.019 | 0.026 | 0.048 | 0.329 | 0.762 | 0.826 | 0.849 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1965 | 0.019 | 0.025 | 0.045 | 0.354 | 0.751 | 0.826 | 0.842 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1966 | 0.019 | 0.026 | 0.045 | 0.394 | 0.791 | 0.849 | 0.849 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1967 | 0.019 | 0.028 | 0.051 | 0.341 | 0.772 | 0.842 | 0.849 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1968 | 0.019 | 0.025 | 0.051 | 0.292 | 0.682 | 0.801 | 0.842 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1969 | 0.019 | 0.028 | 0.043 | 0.227 | 0.682 | 0.801 | 0.842 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1970 | 0.019 | 0.023 | 0.041 | 0.227 | 0.644 | 0.772 | 0.818 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1971 | 0.019 | 0.025 | 0.037 | 0.074 | 0.657 | 0.706 | 0.772 | 0.979 | 0.994 | 0.982 | 0.993 | 1 |
| 1972 | 0.019 | 0.023 | 0.035 | 0.106 | 0.450 | 0.772 | 0.809 | 0.979 | 0.994 | 0.982 | 0.993 | 1 |
| 1973 | 0.022 | 0.028 | 0.163 | 0.382 | 0.697 | 0.801 | 0.834 | 0.996 | 0.996 | 1.000 | 1.000 | 1 |
| 1974 | 0.020 | 0.031 | 0.085 | 0.346 | 0.636 | 0.790 | 0.818 | 0.989 | 1.000 | 1.000 | 1.000 | 1 |
| 1975 | 0.020 | 0.035 | 0.118 | 0.287 | 0.715 | 0.809 | 0.839 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1976 | 0.025 | 0.026 | 0.086 | 0.253 | 0.406 | 0.797 | 0.841 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1977 | 0.019 | 0.024 | 0.060 | 0.382 | 0.742 | 0.817 | 0.842 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1978 | 0.025 | 0.025 | 0.052 | 0.192 | 0.737 | 0.820 | 0.836 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1979 | 0.019 | 0.021 | 0.053 | 0.282 | 0.635 | 0.790 | 0.836 | 0.919 | 1.000 | 1.000 | 1.000 | 1 |
| 1980 | 0.026 | 0.021 | 0.047 | 0.225 | 0.653 | 0.777 | 0.834 | 0.977 | 1.000 | 0.964 | 1.000 | 1 |
| 1981 | 0.019 | 0.022 | 0.030 | 0.090 | 0.448 | 0.751 | 0.811 | 0.962 | 0.988 | 1.000 | 1.000 | 1 |
| 1982 | 0.021 | 0.025 | 0.038 | 0.065 | 0.297 | 0.705 | 0.815 | 0.967 | 1.000 | 1.000 | 1.000 | 1 |
| 1983 | 0.019 | 0.030 | 0.047 | 0.116 | 0.264 | 0.530 | 0.715 | 0.979 | 0.985 | 1.000 | 1.000 | 1 |
| 1984 | 0.019 | 0.024 | 0.053 | 0.169 | 0.444 | 0.620 | 0.716 | 0.949 | 0.969 | 0.948 | 1.000 | 1 |
| 1985 | NA | 0.021 | 0.186 | 0.414 | 0.495 | 0.730 | 0.580 | 0.746 | 1.000 | 1.000 | 1.000 | 1 |
| 1986 | 0.001 | 0.023 | 0.154 | 0.398 | 0.681 | 0.727 | 0.936 | 0.667 | 1.000 | 1.000 | 1.000 | 1 |
| 1987 | 0.001 | 0.033 | 0.094 | 0.359 | 0.487 | 0.879 | 0.777 | 0.805 | 1.000 | 1.000 | 1.000 | 1 |
| 1988 | 0.006 | 0.029 | 0.220 | 0.498 | 0.446 | 0.677 | 0.932 | 0.890 | 1.000 | 1.000 | 1.000 | 1 |
| 1989 | 0.008 | 0.026 | 0.141 | 0.363 | 0.621 | 0.639 | 0.619 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1990 | 0.006 | 0.012 | 0.154 | 0.428 | 0.576 | 0.781 | 0.774 | 0.714 | 1.000 | 1.000 | 1.000 | 1 |
| 1991 | NA | 0.055 | 0.149 | 0.368 | 0.629 | 0.787 | 0.654 | 0.901 | 1.000 | 1.000 | 1.000 | 1 |
| 1992 | 0.002 | 0.062 | 0.265 | 0.407 | 0.813 | 0.916 | 0.880 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1993 | 0.006 | 0.085 | 0.267 | 0.462 | 0.684 | 0.795 | 0.843 | 0.834 | 1.000 | 1.000 | 1.000 | 1 |
| 1994 | 0.008 | 0.109 | 0.338 | 0.590 | 0.706 | 0.921 | 0.694 | 0.830 | 1.000 | 1.000 | 1.000 | 1 |
| 1995 | 0.005 | 0.109 | 0.383 | 0.527 | 0.747 | 0.790 | 0.859 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 1996 | 0.002 | 0.032 | 0.186 | 0.501 | 0.653 | 0.733 | 0.810 | 0.774 | 1.000 | 1.000 | 1.000 | 1 |
| 1997 | 0.006 | 0.037 | 0.247 | 0.424 | 0.686 | 0.786 | 0.804 | 0.539 | 1.000 | 1.000 | 1.000 | 1 |
| 1998 | NA | 0.061 | 0.209 | 0.486 | 0.782 | 0.807 | 0.809 | 0.852 | 1.000 | 1.000 | 1.000 | 1 |
| 1999 | 0.012 | 0.044 | 0.239 | 0.517 | 0.650 | 0.836 | 0.691 | 0.974 | 1.000 | 1.000 | 1.000 | 1 |
| 2000 | 0.001 | 0.065 | 0.248 | 0.512 | 0.611 | 0.867 | 0.998 | 0.999 | 1.000 | 1.000 | 1.000 | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 0.003 | 0.046 | 0.286 | 0.599 | 0.761 | 0.766 | 0.883 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 2002 | 0.006 | 0.086 | 0.321 | 0.656 | 0.759 | 0.920 | 0.559 | 0.724 | 1.000 | 1.000 | 1.000 | 1 |
| 2003 | 0.005 | 0.048 | 0.222 | 0.532 | 0.873 | 0.798 | 0.879 | 0.837 | 1.000 | 1.000 | 1.000 | 1 |
| 2004 | NA | 0.040 | 0.251 | 0.553 | 0.638 | 0.837 | 0.813 | 0.861 | 1.000 | 1.000 | 1.000 | 1 |
| 2005 | 0.003 | 0.108 | 0.281 | 0.494 | 0.795 | 0.808 | 0.949 | 0.904 | 1.000 | 1.000 | 1.000 | 1 |
| 2006 | 0.002 | 0.023 | 0.298 | 0.446 | 0.749 | 0.874 | 0.739 | 0.741 | 1.000 | 1.000 | 1.000 | 1 |
| 2007 | 0.012 | 0.031 | 0.156 | 0.504 | 0.696 | 0.797 | 0.836 | 0.926 | 1.000 | 1.000 | 1.000 | 1 |
| 2008 | 0.001 | 0.042 | 0.275 | 0.546 | 0.728 | 0.833 | 0.850 | 0.958 | 1.000 | 1.000 | 1.000 | 1 |
| 2009 | 0.002 | 0.015 | 0.134 | 0.451 | 0.684 | 0.884 | 0.752 | 0.631 | 1.000 | 1.000 | 1.000 | 1 |
| 2010 | NA | 0.015 | 0.057 | 0.380 | 0.821 | 0.868 | 0.927 | 0.813 | 1.000 | 1.000 | 1.000 | 1 |
| 2011 | 0.002 | 0.012 | 0.136 | 0.427 | 0.732 | 0.923 | 0.941 | 0.961 | 1.000 | 1.000 | 1.000 | 1 |
| 2012 | 0.004 | 0.031 | 0.127 | 0.414 | 0.730 | 0.884 | 0.963 | 0.850 | 1.000 | 1.000 | 1.000 | 1 |
| 2013 | 0.003 | 0.008 | 0.062 | 0.344 | 0.738 | 0.922 | 0.965 | 1.000 | 1.000 | 1.000 | 1.000 | 1 |
| 2014 | NA | 0.026 | 0.069 | 0.238 | 0.615 | 0.893 | 0.967 | 0.956 | 1.000 | 1.000 | 1.000 | 1 |
| 2015 | 0.003 | 0.007 | 0.110 | 0.353 | 0.636 | 0.907 | 0.978 | 0.988 | 1.000 | 1.000 | 1.000 | 1 |
| 2016 | 0.001 | 0.009 | 0.025 | 0.289 | 0.543 | 0.731 | 0.941 | 0.986 | 1.000 | 1.000 | 1.000 | 1 |
| 2017 | 0.005 | 0.008 | 0.089 | 0.262 | 0.765 | 0.906 | 0.979 | 0.987 | 1.000 | 1.000 | 1.000 | 1 |

**Icelandic cod in Division Va. Estimated survey weight (g) at age in the spring survey (SMB).**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1985 | 0.014 | 0.136 | 0.388 | 1.121 | 1.736 | 2.589 | 3.242 | 4.730 | 5.975 |
| 1986 | 0.015 | 0.159 | 0.617 | 1.222 | 2.251 | 2.967 | 4.328 | 5.594 | 7.213 |
| 1987 | 0.014 | 0.117 | 0.468 | 1.199 | 1.752 | 2.982 | 4.195 | 6.327 | 6.931 |
| 1988 | 0.011 | 0.122 | 0.495 | 1.076 | 1.964 | 3.095 | 3.549 | 4.352 | 8.085 |
| 1989 | 0.022 | 0.151 | 0.544 | 1.144 | 1.946 | 3.065 | 4.393 | 6.254 | 7.009 |
| 1990 | 0.019 | 0.135 | 0.461 | 1.037 | 1.814 | 2.595 | 3.868 | 6.022 | 8.051 |
| 1991 | 0.018 | 0.147 | 0.554 | 1.167 | 1.842 | 2.587 | 3.268 | 5.722 | 7.588 |
| 1992 | 0.024 | 0.133 | 0.500 | 1.012 | 1.846 | 2.569 | 3.649 | 5.028 | 7.396 |
| 1993 | 0.012 | 0.171 | 0.576 | 1.167 | 1.945 | 2.991 | 3.959 | 5.354 | 5.975 |
| 1994 | 0.013 | 0.174 | 0.686 | 1.413 | 2.044 | 3.179 | 4.124 | 6.246 | 8.242 |
| 1995 | 0.010 | 0.134 | 0.606 | 1.378 | 2.285 | 2.990 | 4.449 | 5.333 | 8.056 |
| 1996 | 0.011 | 0.155 | 0.551 | 1.352 | 2.084 | 3.322 | 4.044 | 5.257 | 7.461 |
| 1997 | 0.018 | 0.139 | 0.546 | 1.194 | 2.170 | 3.214 | 4.856 | 5.494 | 6.462 |
| 1998 | 0.015 | 0.154 | 0.482 | 1.193 | 2.042 | 3.018 | 4.249 | 5.418 | 6.334 |
| 1999 | 0.014 | 0.140 | 0.578 | 1.070 | 1.849 | 2.869 | 3.821 | 4.981 | 5.630 |
| 2000 | 0.016 | 0.124 | 0.486 | 1.195 | 1.818 | 2.771 | 4.065 | 5.343 | 8.478 |
| 2001 | 0.017 | 0.152 | 0.530 | 1.185 | 1.845 | 2.625 | 3.781 | 5.491 | 6.473 |
| 2002 | 0.013 | 0.132 | 0.511 | 1.207 | 1.999 | 2.921 | 3.778 | 5.753 | 6.253 |
| 2003 | 0.016 | 0.131 | 0.466 | 1.179 | 1.919 | 2.787 | 4.137 | 4.673 | 6.247 |
| 2004 | 0.020 | 0.147 | 0.480 | 1.062 | 1.873 | 2.805 | 3.461 | 4.982 | 5.299 |
| 2005 | 0.011 | 0.118 | 0.451 | 1.029 | 1.760 | 2.644 | 3.646 | 4.359 | 7.232 |
| 2006 | 0.013 | 0.105 | 0.417 | 0.982 | 1.690 | 2.602 | 4.049 | 4.748 | 5.613 |
| 2007 | 0.014 | 0.101 | 0.409 | 0.969 | 1.664 | 2.344 | 3.636 | 5.011 | 6.104 |
| 2008 | 0.011 | 0.121 | 0.376 | 0.938 | 1.806 | 2.613 | 3.590 | 4.920 | 6.371 |
| 2009 | 0.012 | 0.113 | 0.412 | 0.845 | 1.605 | 2.637 | 3.679 | 4.712 | 5.852 |
| 2010 | 0.013 | 0.098 | 0.391 | 1.008 | 1.698 | 2.569 | 4.014 | 4.886 | 6.047 |
| 2011 | 0.012 | 0.102 | 0.395 | 1.127 | 2.115 | 2.987 | 4.224 | 5.871 | 6.630 |
| 2012 | 0.012 | 0.142 | 0.477 | 1.144 | 1.930 | 3.182 | 4.252 | 5.715 | 7.803 |
| 2013 | 0.013 | 0.111 | 0.497 | 1.053 | 1.786 | 3.024 | 4.771 | 6.377 | 8.096 |
| 2014 | 0.011 | 0.114 | 0.359 | 1.078 | 1.710 | 2.634 | 3.989 | 6.164 | 8.060 |
| 2015 | 0.013 | 0.150 | 0.418 | 0.897 | 2.059 | 3.022 | 4.403 | 6.066 | 8.635 |
| 2016 | 0.010 | 0.120 | 0.482 | 1.013 | 1.581 | 3.150 | 3.992 | 5.521 | 7.216 |
| 2017 | 0.014 | 0.091 | 0.424 | 1.227 | 1.940 | 2.722 | 5.166 | 6.457 | 7.583 |

**Icelandic cod in Division Va. Survey indices of the spring bottom trawl survey (SMB).**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | 17.18 | 111.09 | 35.37 | 48.22 | 64.39 | 22.82 | 15.02 | 5.02 | 3.37 | 1.86 |
| 1986 | 15.58 | 60.72 | 96.37 | 22.54 | 21.43 | 26.58 | 6.80 | 2.52 | 0.85 | 0.75 |
| 1987 | 3.66 | 28.10 | 103.72 | 81.99 | 21.11 | 12.27 | 12.07 | 2.57 | 0.90 | 0.38 |
| 1988 | 3.44 | 6.97 | 72.79 | 101.73 | 66.64 | 7.83 | 5.91 | 6.29 | 0.58 | 0.24 |
| 1989 | 4.02 | 16.40 | 21.19 | 73.01 | 64.90 | 33.49 | 4.16 | 1.44 | 1.13 | 0.24 |
| 1990 | 5.55 | 11.74 | 26.34 | 14.19 | 27.12 | 32.45 | 14.24 | 1.50 | 0.52 | 0.41 |
| 1991 | 3.95 | 15.96 | 18.10 | 30.06 | 15.20 | 18.05 | 20.90 | 4.24 | 0.79 | 0.29 |
| 1992 | 0.71 | 16.85 | 33.48 | 18.71 | 16.13 | 6.46 | 5.66 | 5.08 | 1.28 | 0.22 |
| 1993 | 3.56 | 4.71 | 30.64 | 36.33 | 13.18 | 9.86 | 2.12 | 1.74 | 1.16 | 0.36 |
| 1994 | 14.21 | 14.81 | 8.98 | 26.62 | 21.88 | 5.76 | 3.61 | 0.69 | 0.47 | 0.44 |
| 1995 | 1.08 | 29.10 | 24.72 | 8.99 | 23.92 | 17.73 | 3.80 | 1.81 | 0.36 | 0.17 |
| 1996 | 3.70 | 5.38 | 42.36 | 29.43 | 12.92 | 14.71 | 14.13 | 3.81 | 1.05 | 0.18 |
| 1997 | 1.20 | 22.35 | 13.52 | 56.20 | 29.01 | 9.47 | 8.77 | 6.58 | 0.56 | 0.21 |
| 1998 | 8.04 | 5.43 | 30.07 | 15.94 | 61.39 | 28.50 | 6.49 | 5.22 | 3.02 | 0.66 |
| 1999 | 7.37 | 33.04 | 6.98 | 41.92 | 12.94 | 23.61 | 11.12 | 2.36 | 1.32 | 0.70 |
| 2000 | 18.85 | 27.58 | 54.89 | 6.95 | 30.07 | 8.30 | 8.20 | 4.16 | 0.51 | 0.30 |
| 2001 | 12.09 | 21.80 | 36.29 | 37.84 | 4.94 | 14.97 | 3.28 | 1.94 | 0.82 | 0.29 |
| 2002 | 0.96 | 37.80 | 41.06 | 40.07 | 36.25 | 7.11 | 8.32 | 1.49 | 0.72 | 0.30 |
| 2003 | 11.15 | 4.16 | 46.30 | 36.58 | 28.47 | 16.92 | 3.83 | 4.34 | 1.03 | 0.20 |
| 2004 | 6.57 | 24.39 | 7.86 | 61.70 | 35.02 | 24.87 | 14.48 | 2.83 | 2.88 | 0.47 |
| 2005 | 2.56 | 14.54 | 38.70 | 9.67 | 43.55 | 22.99 | 10.86 | 5.77 | 0.93 | 0.92 |
| 2006 | 8.77 | 6.38 | 22.66 | 38.42 | 10.84 | 27.82 | 10.09 | 3.56 | 1.39 | 0.25 |
| 2007 | 5.59 | 18.25 | 8.58 | 20.99 | 27.44 | 9.03 | 9.73 | 5.07 | 2.10 | 0.74 |
| 2008 | 6.39 | 11.78 | 22.05 | 9.29 | 20.41 | 20.40 | 8.09 | 6.61 | 2.46 | 0.60 |
| 2009 | 21.45 | 11.73 | 15.67 | 21.43 | 14.39 | 23.30 | 14.51 | 4.13 | 2.72 | 1.03 |
| 2010 | 18.22 | 19.97 | 17.98 | 17.70 | 23.75 | 13.28 | 16.61 | 8.89 | 2.68 | 1.65 |
| 2011 | 3.54 | 21.45 | 26.59 | 19.89 | 22.50 | 25.37 | 13.55 | 12.35 | 4.55 | 0.91 |
| 2012 | 19.93 | 9.76 | 37.52 | 56.45 | 41.50 | 30.22 | 27.05 | 9.98 | 6.29 | 2.75 |
| 2013 | 10.75 | 31.42 | 17.72 | 43.71 | 46.35 | 25.18 | 16.43 | 13.73 | 6.85 | 3.31 |
| 2014 | 3.29 | 23.98 | 38.21 | 23.51 | 47.13 | 37.61 | 17.35 | 8.19 | 4.25 | 2.22 |
| 2015 | 20.86 | 10.68 | 27.42 | 41.68 | 20.88 | 40.89 | 28.27 | 16.55 | 4.99 | 3.12 |
| 2016 | 31.35 | 29.15 | 14.34 | 36.60 | 53.92 | 27.33 | 37.00 | 18.25 | 6.76 | 2.26 |
| 2017 | 3.77 | 23.20 | 31.85 | 17.79 | 35.93 | 39.72 | 23.06 | 22.10 | 11.63 | 5.09 |

**Icelandic cod in Division Va. Survey indices of the fall bottom trawl survey (SMH).**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 6.32 | 3.43 | 19.59 | 14.19 | 5.57 | 7.70 | 6.49 | 1.65 | 0.31 | 0.08 |
| 1997 | 0.65 | 16.65 | 6.65 | 29.24 | 16.35 | 5.40 | 3.74 | 2.13 | 0.31 | 0.14 |
| 1998 | 5.72 | 2.58 | 15.34 | 7.29 | 16.10 | 16.16 | 5.24 | 2.25 | 1.27 | 0.20 |
| 1999 | 8.00 | 13.79 | 5.58 | 23.16 | 7.45 | 10.04 | 4.08 | 0.59 | 0.34 | 0.37 |
| 2000 | 4.52 | 12.74 | 15.24 | 3.76 | 11.54 | 3.64 | 2.71 | 1.14 | 0.34 | 0.28 |
| 2001 | 6.89 | 11.29 | 19.32 | 21.27 | 3.40 | 6.93 | 1.65 | 0.79 | 0.18 | 0.03 |
| 2002 | 0.93 | 13.19 | 15.84 | 23.39 | 16.21 | 5.53 | 4.86 | 1.13 | 0.63 | 0.08 |
| 2003 | 5.20 | 2.73 | 26.03 | 17.31 | 13.48 | 9.12 | 1.93 | 2.59 | 0.37 | 0.10 |
| 2004 | 3.57 | 15.82 | 6.89 | 30.30 | 19.39 | 12.08 | 7.61 | 1.92 | 1.68 | 0.23 |
| 2005 | 2.13 | 8.87 | 19.97 | 6.77 | 26.10 | 11.30 | 4.00 | 1.96 | 0.31 | 0.32 |
| 2006 | 4.41 | 4.41 | 15.86 | 22.85 | 7.78 | 14.47 | 6.31 | 2.12 | 1.05 | 0.17 |
| 2007 | 3.67 | 9.57 | 4.90 | 12.10 | 16.26 | 6.53 | 6.10 | 3.21 | 0.80 | 0.53 |
| 2008 | 5.17 | 11.84 | 15.08 | 7.67 | 18.06 | 19.13 | 5.80 | 5.67 | 1.50 | 0.79 |
| 2009 | 6.92 | 8.17 | 13.02 | 18.17 | 12.69 | 17.14 | 10.61 | 3.27 | 2.86 | 0.96 |
| 2010 | 10.32 | 19.10 | 16.40 | 15.59 | 18.12 | 10.01 | 11.42 | 6.90 | 2.30 | 1.24 |
| 2011 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2012 | 7.17 | 9.40 | 23.44 | 20.88 | 12.88 | 10.95 | 9.64 | 5.35 | 3.34 | 1.55 |
| 2013 | 6.04 | 19.00 | 13.18 | 26.67 | 21.82 | 12.67 | 7.85 | 6.04 | 2.96 | 1.88 |
| 2014 | 3.53 | 15.90 | 23.63 | 13.89 | 23.81 | 19.89 | 8.54 | 5.89 | 4.00 | 2.49 |
| 2015 | 16.72 | 8.81 | 26.39 | 36.28 | 17.48 | 27.86 | 16.46 | 5.64 | 3.32 | 1.18 |
| 2016 | 11.49 | 18.17 | 7.90 | 17.83 | 22.52 | 10.64 | 11.95 | 6.79 | 2.75 | 1.61 |

**Icelandic cod in Division Va. Catch at age residuals from the ADCAM model tuned with the spring (SMB) and the fall (SMH) surveys.**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | -0.12 | -0.21 | 0.08 | 0.12 | 0.21 | -0.12 | -0.16 | 0.13 | -0.10 | -0.45 | -0.20 | 0.00 |
| 1956 | -0.03 | -0.05 | 0.03 | -0.01 | -0.13 | -0.20 | -0.01 | 0.01 | 0.18 | 0.09 | 0.23 | 0.22 |
| 1957 | 0.09 | 0.02 | -0.02 | 0.17 | -0.13 | 0.09 | 0.06 | -0.15 | -0.10 | -0.11 | -0.38 | 0.52 |
| 1958 | 0.15 | 0.18 | -0.26 | -0.07 | 0.06 | 0.08 | 0.13 | -0.23 | 0.23 | 0.00 | -0.23 | 0.39 |
| 1959 | -0.21 | 0.21 | 0.26 | -0.24 | -0.22 | -0.06 | -0.07 | 0.28 | -0.26 | 0.38 | -0.23 | -0.40 |
| 1960 | 0.10 | -0.36 | 0.14 | 0.19 | 0.06 | 0.07 | -0.03 | -0.11 | -0.04 | 0.03 | -0.64 | 0.91 |
| 1961 | 0.05 | 0.04 | -0.40 | 0.12 | -0.02 | 0.27 | 0.20 | -0.14 | 0.09 | -0.19 | -0.97 | 0.83 |
| 1962 | 0.09 | -0.01 | 0.13 | -0.24 | 0.12 | -0.30 | 0.09 | 0.26 | -0.06 | 0.03 | -0.40 | 0.70 |
| 1963 | -0.06 | 0.30 | -0.17 | 0.01 | -0.03 | -0.07 | -0.38 | 0.21 | 0.35 | 0.06 | 0.07 | -0.61 |
| 1964 | -0.13 | -0.01 | 0.13 | -0.25 | -0.12 | 0.38 | -0.10 | -0.46 | -0.01 | 0.27 | -0.16 | 0.01 |
| 1965 | -0.03 | -0.11 | 0.09 | 0.16 | -0.13 | 0.05 | 0.47 | -0.48 | -0.06 | -0.51 | -0.36 | 0.64 |
| 1966 | -0.04 | -0.04 | -0.18 | 0.10 | -0.07 | 0.12 | -0.35 | 0.59 | -0.83 | 0.28 | 0.01 | 1.06 |
| 1967 | 0.19 | -0.13 | 0.02 | -0.20 | 0.03 | -0.37 | 0.49 | 0.05 | 0.67 | -0.73 | -0.83 | -0.18 |
| 1968 | 0.03 | -0.02 | -0.27 | -0.12 | 0.23 | 0.16 | -0.42 | 0.37 | -0.12 | 0.60 | -0.66 | 0.66 |
| 1969 | -0.09 | -0.03 | 0.15 | -0.01 | 0.05 | -0.15 | -0.32 | -0.24 | -0.04 | -0.26 | -0.81 | -0.14 |
| 1970 | -0.10 | 0.14 | -0.05 | -0.14 | 0.05 | -0.16 | 0.48 | -0.58 | -0.12 | 0.25 | 0.30 | 0.45 |
| 1971 | -0.10 | 0.07 | 0.09 | 0.18 | -0.18 | 0.28 | -0.17 | 0.05 | -0.45 | -0.02 | 0.12 | 0.36 |
| 1972 | -0.17 | -0.13 | 0.07 | -0.03 | 0.12 | -0.05 | -0.10 | 0.29 | -0.07 | 0.17 | 0.53 | -2.77 |
| 1973 | 0.27 | -0.02 | -0.10 | 0.03 | 0.00 | -0.24 | 0.09 | 0.17 | 0.16 | -0.19 | -1.25 | -2.10 |
| 1974 | -0.16 | 0.21 | -0.02 | -0.18 | -0.01 | 0.00 | -0.22 | 0.29 | 0.01 | 0.19 | -0.43 | 0.80 |
| 1975 | 0.19 | -0.07 | 0.04 | -0.05 | 0.03 | -0.15 | -0.21 | 0.00 | 0.41 | -0.02 | -0.12 | 0.08 |
| 1976 | 0.10 | 0.00 | -0.17 | 0.08 | -0.09 | 0.25 | -0.16 | -0.15 | 0.06 | 0.27 | -0.23 | 0.22 |
| 1977 | -0.40 | -0.06 | 0.05 | -0.09 | 0.13 | 0.05 | 0.31 | 0.03 | -0.70 | -0.48 | -1.22 | -2.51 |
| 1978 | 0.08 | -0.01 | 0.04 | -0.10 | 0.04 | -0.21 | 0.12 | -0.19 | 0.01 | -0.05 | 0.53 | 1.19 |
| 1979 | 0.16 | 0.09 | -0.22 | 0.10 | -0.05 | 0.03 | -0.31 | -0.08 | 0.04 | -0.14 | 0.42 | -0.20 |
| 1980 | 0.21 | 0.01 | 0.08 | 0.06 | -0.01 | -0.09 | 0.12 | -0.49 | 0.29 | 0.10 | 0.16 | -1.09 |
| 1981 | -0.30 | -0.21 | 0.08 | -0.14 | 0.07 | 0.09 | 0.02 | 0.33 | -0.08 | 0.60 | -0.01 | 1.17 |
| 1982 | 0.01 | 0.15 | 0.07 | -0.05 | -0.22 | 0.19 | 0.18 | 0.14 | -0.23 | -0.87 | 0.05 | -0.87 |
| 1983 | -0.32 | -0.36 | 0.11 | 0.14 | 0.04 | 0.01 | -0.04 | -0.03 | 0.00 | 0.37 | -0.19 | 0.57 |
| 1984 | 0.34 | 0.03 | -0.06 | -0.04 | -0.10 | 0.00 | 0.05 | -0.14 | -0.35 | 0.17 | 0.72 | 0.08 |
| 1985 | 0.04 | 0.18 | -0.10 | 0.12 | -0.10 | -0.02 | -0.14 | 0.13 | 0.03 | -0.34 | 0.48 | 0.45 |
| 1986 | 0.14 | -0.12 | 0.01 | -0.01 | 0.18 | -0.04 | 0.11 | -0.21 | 0.08 | 0.05 | -0.58 | 0.16 |
| 1987 | -0.15 | 0.12 | 0.01 | -0.17 | 0.07 | 0.04 | -0.02 | 0.11 | -0.38 | -0.11 | 0.13 | -0.32 |
| 1988 | -0.09 | -0.07 | -0.06 | 0.13 | -0.09 | 0.08 | 0.16 | 0.03 | 0.47 | 0.02 | 0.54 | 0.07 |
| 1989 | -0.21 | 0.04 | 0.14 | -0.08 | 0.00 | -0.15 | -0.31 | -0.09 | -0.02 | 0.52 | -0.02 | -1.47 |
| 1990 | -0.01 | -0.14 | -0.11 | 0.00 | 0.04 | 0.09 | -0.08 | -0.21 | 0.29 | 0.12 | -0.21 | 0.03 |
| 1991 | 0.06 | 0.04 | -0.14 | -0.07 | 0.10 | -0.07 | 0.12 | -0.07 | -0.30 | 0.41 | -0.55 | 0.07 |
| 1992 | -0.24 | 0.07 | 0.04 | 0.02 | 0.10 | 0.00 | -0.04 | -0.06 | -0.74 | -0.75 | -0.56 | -0.21 |
| 1993 | 0.25 | 0.04 | -0.21 | -0.06 | -0.07 | -0.12 | 0.08 | 0.49 | 0.50 | -0.21 | -0.98 | 0.35 |
| 1994 | 0.02 | 0.24 | -0.14 | -0.20 | -0.04 | 0.07 | -0.19 | -0.13 | 0.44 | 0.53 | 0.52 | -0.47 |
| 1995 | 0.27 | -0.04 | 0.08 | -0.04 | -0.04 | -0.12 | -0.12 | -0.29 | -0.20 | 0.75 | 1.13 | 0.54 |
| 1996 | 0.00 | -0.05 | -0.19 | 0.07 | 0.04 | 0.01 | 0.13 | 0.18 | -0.36 | -0.37 | 0.65 | -0.10 |
| 1997 | -0.17 | 0.03 | -0.03 | -0.14 | -0.10 | 0.21 | 0.17 | 0.27 | 0.44 | -0.70 | -0.18 | 0.14 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | -0.18 | -0.17 | 0.07 | 0.07 | 0.01 | -0.16 | 0.25 | 0.06 | 0.12 | 0.32 | 0.20 | -0.77 |
| 1999 | -0.12 | 0.04 | 0.04 | 0.04 | 0.09 | -0.05 | -0.23 | -0.17 | -0.24 | -0.38 | -0.46 | -0.99 |
| 2000 | 0.15 | -0.24 | 0.12 | -0.04 | 0.01 | 0.11 | 0.03 | -0.12 | 0.01 | 0.14 | -0.16 | -0.23 |
| 2001 | 0.24 | 0.22 | -0.19 | 0.02 | 0.04 | -0.25 | 0.07 | 0.33 | -0.12 | 0.20 | -0.65 | 0.93 |
| 2002 | -0.10 | 0.05 | 0.03 | -0.05 | 0.01 | 0.03 | -0.09 | 0.25 | 0.32 | -0.12 | 0.15 | -0.85 |
| 2003 | -0.07 | 0.03 | 0.00 | -0.11 | 0.11 | 0.07 | 0.20 | -0.18 | 0.10 | 0.25 | 0.13 | 0.80 |
| 2004 | -0.27 | 0.06 | 0.08 | -0.05 | -0.04 | 0.24 | -0.04 | 0.23 | -0.33 | 0.21 | 0.31 | -0.29 |
| 2005 | 0.18 | -0.26 | 0.13 | -0.06 | -0.11 | -0.07 | 0.30 | -0.01 | 0.41 | 0.19 | 0.35 | -0.20 |
| 2006 | -0.05 | 0.04 | -0.11 | 0.06 | 0.06 | -0.07 | -0.08 | 0.20 | -0.22 | -0.25 | -0.61 | -0.13 |
| 2007 | -0.16 | 0.15 | -0.05 | 0.02 | -0.13 | 0.09 | 0.02 | 0.18 | 0.78 | -0.25 | 1.18 | -0.86 |
| 2008 | 0.12 | -0.18 | 0.08 | -0.15 | 0.05 | -0.19 | 0.04 | 0.14 | -0.08 | 0.42 | 0.27 | -0.61 |
| 2009 | 0.08 | -0.11 | 0.06 | 0.15 | -0.01 | 0.23 | -0.21 | -0.24 | -0.02 | -0.36 | 0.24 | -0.36 |
| 2010 | 0.09 | 0.03 | -0.14 | 0.03 | 0.05 | -0.06 | 0.18 | -0.20 | -0.17 | 0.14 | 0.35 | 0.71 |
| 2011 | -0.01 | -0.03 | 0.09 | 0.01 | -0.02 | -0.01 | -0.11 | 0.10 | -0.13 | -0.18 | -0.20 | -0.38 |
| 2012 | -0.14 | 0.03 | 0.01 | -0.03 | 0.00 | 0.18 | 0.01 | -0.24 | -0.03 | -0.15 | 0.09 | -0.19 |
| 2013 | 0.29 | -0.03 | 0.05 | 0.04 | -0.07 | -0.04 | 0.15 | -0.02 | -0.20 | 0.14 | 0.12 | -0.40 |
| 2014 | -0.12 | 0.03 | 0.03 | 0.00 | 0.00 | -0.06 | -0.06 | 0.12 | 0.00 | -0.16 | 0.45 | 0.18 |
| 2015 | 0.05 | 0.07 | 0.09 | 0.02 | -0.12 | 0.03 | -0.05 | -0.06 | 0.43 | -0.18 | -0.26 | -0.21 |
| 2016 | -0.07 | 0.01 | -0.13 | 0.08 | 0.08 | -0.03 | 0.05 | -0.02 | -0.09 | 0.40 | -0.09 | -0.72 |

**Icelandic cod in Division Va. Spring survey (SMB) at age residuals from the ADCAM model, assessment tuned with both the spring and the fall survey.**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | -0.51 | 0.09 | 0.26 | 0.48 | 0.18 | 0.30 | 0.44 | 0.24 | 0.37 | 0.75 |
| 1986 | 0.45 | -0.01 | -0.33 | -0.20 | -0.04 | 0.02 | -0.16 | -0.29 | -0.26 | -0.05 |
| 1987 | 0.69 | 0.05 | 0.18 | -0.43 | 0.00 | -0.07 | 0.04 | -0.09 | -0.10 | -0.02 |
| 1988 | -0.19 | 0.06 | 0.55 | 0.18 | -0.11 | -0.35 | 0.07 | 0.43 | -0.16 | -0.14 |
| 1989 | 0.39 | 0.11 | 0.53 | 0.51 | 0.16 | 0.09 | -0.19 | -0.16 | 0.10 | 0.08 |
| 1990 | -0.49 | 0.16 | 0.12 | 0.09 | -0.14 | -0.18 | -0.01 | -0.20 | -0.06 | 0.11 |
| 1991 | -0.16 | -0.40 | 0.13 | 0.18 | 0.27 | 0.04 | 0.13 | -0.21 | 0.15 | 0.20 |
| 1992 | -0.21 | 0.07 | -0.14 | 0.13 | -0.08 | -0.14 | -0.18 | -0.18 | -0.16 | 0.02 |
| 1993 | -0.52 | -0.01 | 0.22 | -0.02 | 0.06 | -0.06 | -0.25 | -0.21 | -0.30 | -0.24 |
| 1994 | 0.51 | -0.21 | 0.04 | 0.14 | -0.17 | -0.32 | -0.19 | -0.24 | -0.20 | -0.11 |
| 1995 | -0.20 | 0.18 | -0.18 | -0.04 | 0.19 | 0.00 | -0.22 | -0.07 | -0.05 | -0.24 |
| 1996 | -0.65 | -0.09 | 0.14 | -0.10 | 0.21 | -0.04 | 0.25 | 0.37 | 0.20 | 0.02 |
| 1997 | 0.23 | 0.00 | 0.15 | 0.31 | -0.02 | -0.05 | -0.05 | 0.22 | -0.35 | -0.31 |
| 1998 | -0.11 | 0.16 | -0.13 | 0.13 | 0.52 | 0.29 | 0.06 | 0.18 | 0.41 | 0.44 |
| 1999 | -0.05 | 0.23 | -0.02 | 0.07 | -0.05 | 0.07 | 0.00 | -0.06 | -0.06 | 0.05 |
| 2000 | 0.89 | 0.17 | 0.33 | -0.15 | -0.07 | -0.22 | -0.23 | -0.05 | -0.29 | -0.30 |
| 2001 | 0.17 | 0.02 | 0.05 | -0.06 | -0.45 | -0.24 | -0.41 | -0.61 | -0.39 | 0.10 |
| 2002 | -0.08 | 0.28 | 0.19 | 0.10 | 0.07 | -0.15 | -0.20 | -0.33 | -0.48 | -0.25 |
| 2003 | 0.04 | -0.09 | 0.10 | 0.00 | -0.09 | -0.20 | -0.21 | -0.09 | 0.13 | -0.58 |
| 2004 | -0.09 | 0.17 | -0.10 | 0.28 | 0.07 | 0.17 | 0.16 | 0.15 | 0.41 | 0.29 |
| 2005 | -0.15 | -0.01 | 0.19 | -0.10 | 0.08 | 0.07 | -0.05 | 0.02 | 0.05 | 0.28 |
| 2006 | 0.19 | -0.11 | -0.05 | 0.07 | -0.11 | 0.09 | -0.17 | -0.36 | -0.37 | -0.18 |
| 2007 | 0.02 | 0.17 | -0.33 | -0.25 | -0.19 | -0.22 | -0.38 | -0.14 | 0.00 | -0.09 |
| 2008 | -0.07 | -0.01 | -0.07 | -0.43 | -0.30 | -0.15 | 0.05 | -0.13 | 0.01 | -0.28 |
| 2009 | 0.37 | -0.14 | -0.19 | -0.24 | -0.21 | -0.13 | -0.12 | -0.02 | -0.21 | -0.07 |
| 2010 | 0.03 | -0.19 | -0.22 | -0.24 | -0.19 | -0.20 | -0.10 | -0.04 | 0.28 | 0.01 |
| 2011 | -0.46 | -0.26 | -0.34 | -0.28 | -0.10 | 0.07 | 0.09 | 0.11 | 0.00 | -0.09 |
| 2012 | 0.13 | -0.19 | -0.15 | 0.22 | 0.34 | 0.30 | 0.43 | 0.27 | 0.12 | 0.09 |
| 2013 | -0.13 | 0.07 | -0.14 | -0.13 | 0.07 | 0.07 | 0.05 | 0.26 | 0.55 | 0.08 |
| 2014 | -0.29 | 0.06 | -0.13 | -0.04 | 0.00 | 0.20 | 0.02 | -0.14 | -0.21 | 0.06 |
| 2015 | 0.06 | 0.01 | -0.21 | -0.16 | -0.20 | 0.21 | 0.22 | 0.43 | 0.01 | 0.05 |
| 2016 | 0.50 | -0.07 | -0.17 | -0.07 | 0.14 | 0.19 | 0.40 | 0.25 | 0.19 | -0.20 |
| 2017 | -0.25 | -0.23 | -0.37 | -0.15 | -0.07 | 0.18 | 0.32 | 0.36 | 0.44 | 0.48 |

**Icelandic cod in Division Va. Fall survey (SMH) at age residuals from the ADCAM model, assessment tuned with both the spring and the fall survey.**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | -0.05 | -0.11 | -0.03 | -0.18 | -0.01 | -0.07 | 0.19 | 0.21 | -0.18 | -0.08 |
| 1997 | -0.13 | 0.12 | -0.02 | 0.24 | 0.06 | -0.02 | -0.13 | -0.11 | -0.25 | -0.15 |
| 1998 | -0.27 | -0.03 | -0.21 | 0.02 | -0.05 | 0.33 | 0.49 | 0.11 | 0.25 | 0.04 |
| 1999 | 0.16 | -0.11 | 0.13 | 0.09 | 0.05 | -0.03 | -0.13 | -0.31 | -0.37 | 0.10 |
| 2000 | -0.30 | -0.08 | -0.26 | -0.08 | -0.23 | -0.24 | -0.39 | -0.33 | -0.03 | 0.16 |
| 2001 | -0.19 | -0.14 | 0.04 | 0.00 | -0.22 | -0.26 | -0.26 | -0.51 | -0.60 | -0.39 |
| 2002 | -0.11 | -0.20 | -0.13 | 0.16 | 0.00 | 0.11 | -0.01 | 0.01 | -0.03 | -0.44 |
| 2003 | -0.10 | -0.10 | 0.11 | -0.12 | -0.11 | -0.16 | -0.13 | 0.08 | -0.08 | -0.45 |
| 2004 | -0.12 | 0.16 | 0.14 | 0.15 | 0.18 | 0.10 | 0.23 | 0.35 | 0.49 | 0.21 |
| 2005 | 0.10 | -0.06 | 0.10 | 0.08 | 0.25 | 0.01 | -0.26 | -0.25 | -0.18 | -0.04 |
| 2006 | 0.08 | -0.09 | 0.11 | 0.11 | 0.08 | 0.06 | 0.05 | -0.18 | -0.04 | -0.01 |
| 2007 | 0.12 | 0.00 | -0.32 | -0.22 | -0.07 | -0.02 | -0.17 | 0.06 | -0.22 | 0.15 |
| 2008 | 0.24 | 0.27 | 0.06 | -0.13 | 0.12 | 0.24 | 0.29 | 0.28 | 0.07 | 0.38 |
| 2009 | -0.10 | -0.09 | 0.09 | 0.09 | 0.14 | 0.07 | 0.17 | 0.29 | 0.33 | 0.31 |
| 2010 | 0.11 | 0.14 | 0.15 | 0.11 | 0.08 | -0.02 | 0.11 | 0.25 | 0.55 | 0.16 |
| 2011 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2012 | -0.22 | 0.07 | -0.04 | -0.20 | -0.20 | -0.14 | 0.01 | 0.19 | -0.05 | -0.05 |
| 2013 | -0.09 | 0.04 | 0.06 | -0.08 | -0.05 | -0.09 | -0.09 | 0.00 | 0.19 | -0.06 |
| 2014 | 0.21 | 0.09 | -0.03 | -0.01 | -0.06 | 0.05 | -0.09 | 0.06 | 0.15 | 0.55 |
| 2015 | 0.48 | 0.14 | 0.26 | 0.20 | 0.14 | 0.28 | 0.24 | -0.08 | 0.03 | -0.47 |
| 2016 | 0.16 | -0.06 | -0.20 | -0.21 | -0.11 | -0.19 | -0.12 | -0.16 | -0.22 | -0.13 |

**Icelandic cod in Division Va. Estimates of fishing mortality 1955-2016 based on ACAM using catch at age and spring and fall bottom survey indices.**

| YEAR | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 0.04 | 0.17 | 0.25 | 0.27 | 0.30 | 0.30 | 0.28 | 0.33 | 0.33 | 0.31 | 0.33 | 0.33 |
| 1956 | 0.05 | 0.18 | 0.25 | 0.26 | 0.29 | 0.30 | 0.30 | 0.34 | 0.36 | 0.34 | 0.34 | 0.34 |
| 1957 | 0.08 | 0.21 | 0.27 | 0.27 | 0.30 | 0.33 | 0.33 | 0.36 | 0.37 | 0.33 | 0.30 | 0.30 |
| 1958 | 0.11 | 0.25 | 0.30 | 0.29 | 0.32 | 0.37 | 0.40 | 0.44 | 0.45 | 0.39 | 0.33 | 0.33 |
| 1959 | 0.09 | 0.23 | 0.28 | 0.26 | 0.30 | 0.34 | 0.35 | 0.40 | 0.38 | 0.32 | 0.23 | 0.23 |
| 1960 | 0.10 | 0.23 | 0.29 | 0.29 | 0.34 | 0.40 | 0.43 | 0.48 | 0.48 | 0.39 | 0.27 | 0.27 |
| 1961 | 0.09 | 0.23 | 0.26 | 0.26 | 0.33 | 0.40 | 0.42 | 0.46 | 0.44 | 0.35 | 0.23 | 0.23 |
| 1962 | 0.11 | 0.25 | 0.28 | 0.26 | 0.35 | 0.42 | 0.47 | 0.51 | 0.49 | 0.38 | 0.24 | 0.24 |
| 1963 | 0.13 | 0.28 | 0.33 | 0.31 | 0.38 | 0.49 | 0.59 | 0.65 | 0.63 | 0.46 | 0.29 | 0.29 |
| 1964 | 0.13 | 0.29 | 0.37 | 0.36 | 0.43 | 0.57 | 0.74 | 0.81 | 0.84 | 0.61 | 0.39 | 0.39 |
| 1965 | 0.12 | 0.28 | 0.38 | 0.40 | 0.47 | 0.60 | 0.74 | 0.85 | 0.88 | 0.65 | 0.43 | 0.43 |
| 1966 | 0.09 | 0.25 | 0.34 | 0.38 | 0.49 | 0.62 | 0.78 | 0.92 | 1.01 | 0.78 | 0.53 | 0.53 |
| 1967 | 0.08 | 0.23 | 0.30 | 0.34 | 0.48 | 0.61 | 0.75 | 0.88 | 0.93 | 0.72 | 0.46 | 0.46 |
| 1968 | 0.08 | 0.25 | 0.34 | 0.41 | 0.58 | 0.77 | 1.04 | 1.20 | 1.36 | 1.08 | 0.73 | 0.73 |
| 1969 | 0.06 | 0.23 | 0.32 | 0.35 | 0.50 | 0.61 | 0.72 | 0.84 | 0.87 | 0.71 | 0.44 | 0.44 |
| 1970 | 0.07 | 0.27 | 0.39 | 0.43 | 0.55 | 0.65 | 0.76 | 0.89 | 0.95 | 0.80 | 0.51 | 0.51 |
| 1971 | 0.09 | 0.31 | 0.48 | 0.53 | 0.62 | 0.72 | 0.80 | 0.96 | 1.03 | 0.87 | 0.57 | 0.57 |
| 1972 | 0.09 | 0.30 | 0.48 | 0.55 | 0.65 | 0.73 | 0.79 | 0.96 | 1.06 | 0.90 | 0.59 | 0.59 |
| 1973 | 0.12 | 0.32 | 0.49 | 0.56 | 0.67 | 0.75 | 0.80 | 0.95 | 1.04 | 0.89 | 0.58 | 0.58 |
| 1974 | 0.11 | 0.32 | 0.50 | 0.57 | 0.70 | 0.83 | 0.92 | 1.05 | 1.17 | 1.02 | 0.68 | 0.68 |
| 1975 | 0.11 | 0.31 | 0.50 | 0.60 | 0.72 | 0.88 | 1.02 | 1.12 | 1.24 | 1.08 | 0.75 | 0.75 |
| 1976 | 0.07 | 0.26 | 0.43 | 0.55 | 0.69 | 0.85 | 0.94 | 1.00 | 1.05 | 0.92 | 0.63 | 0.63 |
| 1977 | 0.03 | 0.20 | 0.33 | 0.43 | 0.61 | 0.72 | 0.72 | 0.73 | 0.69 | 0.61 | 0.39 | 0.39 |
| 1978 | 0.03 | 0.17 | 0.28 | 0.35 | 0.52 | 0.60 | 0.54 | 0.54 | 0.48 | 0.44 | 0.27 | 0.27 |
| 1979 | 0.03 | 0.17 | 0.27 | 0.34 | 0.50 | 0.57 | 0.49 | 0.49 | 0.41 | 0.38 | 0.23 | 0.23 |
| 1980 | 0.03 | 0.17 | 0.31 | 0.39 | 0.54 | 0.62 | 0.55 | 0.54 | 0.46 | 0.43 | 0.28 | 0.28 |
| 1981 | 0.02 | 0.18 | 0.35 | 0.49 | 0.65 | 0.82 | 0.85 | 0.81 | 0.74 | 0.67 | 0.49 | 0.49 |
| 1982 | 0.03 | 0.19 | 0.39 | 0.56 | 0.70 | 0.90 | 0.95 | 0.86 | 0.73 | 0.65 | 0.48 | 0.48 |
| 1983 | 0.02 | 0.18 | 0.38 | 0.55 | 0.70 | 0.88 | 0.91 | 0.84 | 0.72 | 0.65 | 0.49 | 0.49 |
| 1984 | 0.04 | 0.20 | 0.38 | 0.53 | 0.67 | 0.80 | 0.75 | 0.69 | 0.58 | 0.54 | 0.40 | 0.40 |
| 1985 | 0.05 | 0.23 | 0.42 | 0.58 | 0.71 | 0.83 | 0.76 | 0.69 | 0.58 | 0.54 | 0.40 | 0.40 |
| 1986 | 0.06 | 0.26 | 0.52 | 0.72 | 0.82 | 0.95 | 0.87 | 0.76 | 0.64 | 0.58 | 0.45 | 0.45 |
| 1987 | 0.06 | 0.27 | 0.56 | 0.82 | 0.91 | 1.06 | 0.98 | 0.83 | 0.72 | 0.66 | 0.52 | 0.52 |
| 1988 | 0.05 | 0.26 | 0.53 | 0.80 | 0.92 | 1.10 | 1.07 | 0.93 | 0.85 | 0.78 | 0.64 | 0.64 |
| 1989 | 0.04 | 0.24 | 0.46 | 0.66 | 0.79 | 0.89 | 0.79 | 0.70 | 0.62 | 0.58 | 0.45 | 0.45 |
| 1990 | 0.05 | 0.25 | 0.47 | 0.66 | 0.79 | 0.85 | 0.74 | 0.67 | 0.59 | 0.55 | 0.42 | 0.42 |
| 1991 | 0.09 | 0.30 | 0.57 | 0.81 | 0.88 | 0.94 | 0.83 | 0.75 | 0.67 | 0.62 | 0.49 | 0.49 |
| 1992 | 0.10 | 0.32 | 0.60 | 0.87 | 0.92 | 1.00 | 0.88 | 0.78 | 0.70 | 0.64 | 0.51 | 0.51 |
| 1993 | 0.14 | 0.31 | 0.56 | 0.81 | 0.89 | 1.03 | 1.01 | 0.90 | 0.85 | 0.77 | 0.64 | 0.64 |
| 1994 | 0.09 | 0.24 | 0.38 | 0.53 | 0.68 | 0.76 | 0.70 | 0.67 | 0.61 | 0.57 | 0.45 | 0.45 |
| 1995 | 0.06 | 0.19 | 0.32 | 0.42 | 0.57 | 0.62 | 0.55 | 0.55 | 0.49 | 0.46 | 0.36 | 0.36 |
| 1996 | 0.04 | 0.16 | 0.28 | 0.41 | 0.56 | 0.62 | 0.57 | 0.57 | 0.51 | 0.48 | 0.38 | 0.38 |
| 1997 | 0.03 | 0.14 | 0.27 | 0.42 | 0.58 | 0.66 | 0.64 | 0.65 | 0.59 | 0.54 | 0.44 | 0.44 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1998 | 0.03 | 0.15 | 0.33 | 0.52 | 0.66 | 0.77 | 0.79 | 0.77 | 0.72 | 0.65 | 0.55 | 0.55 |
| 1999 | 0.04 | 0.17 | 0.39 | 0.64 | 0.73 | 0.84 | 0.87 | 0.83 | 0.77 | 0.69 | 0.59 | 0.59 |
| 2000 | 0.06 | 0.18 | 0.38 | 0.61 | 0.73 | 0.85 | 0.89 | 0.86 | 0.81 | 0.72 | 0.63 | 0.63 |
| 2001 | 0.07 | 0.19 | 0.38 | 0.57 | 0.68 | 0.83 | 0.92 | 0.92 | 0.88 | 0.79 | 0.70 | 0.70 |
| 2002 | 0.05 | 0.16 | 0.34 | 0.48 | 0.60 | 0.71 | 0.80 | 0.83 | 0.79 | 0.71 | 0.62 | 0.62 |
| 2003 | 0.04 | 0.15 | 0.33 | 0.49 | 0.57 | 0.67 | 0.73 | 0.77 | 0.73 | 0.66 | 0.58 | 0.58 |
| 2004 | 0.03 | 0.14 | 0.33 | 0.52 | 0.58 | 0.68 | 0.74 | 0.77 | 0.74 | 0.67 | 0.59 | 0.59 |
| 2005 | 0.03 | 0.13 | 0.29 | 0.48 | 0.55 | 0.65 | 0.70 | 0.73 | 0.71 | 0.64 | 0.56 | 0.56 |
| 2006 | 0.03 | 0.12 | 0.27 | 0.46 | 0.54 | 0.64 | 0.69 | 0.70 | 0.68 | 0.60 | 0.52 | 0.52 |
| 2007 | 0.03 | 0.11 | 0.23 | 0.39 | 0.49 | 0.61 | 0.68 | 0.69 | 0.67 | 0.59 | 0.52 | 0.52 |
| 2008 | 0.02 | 0.09 | 0.18 | 0.30 | 0.41 | 0.50 | 0.52 | 0.52 | 0.48 | 0.43 | 0.35 | 0.35 |
| 2009 | 0.03 | 0.10 | 0.19 | 0.31 | 0.41 | 0.49 | 0.50 | 0.48 | 0.43 | 0.38 | 0.30 | 0.30 |
| 2010 | 0.03 | 0.09 | 0.16 | 0.25 | 0.36 | 0.42 | 0.40 | 0.38 | 0.33 | 0.30 | 0.22 | 0.22 |
| 2011 | 0.03 | 0.09 | 0.16 | 0.24 | 0.33 | 0.38 | 0.35 | 0.33 | 0.28 | 0.25 | 0.17 | 0.17 |
| 2012 | 0.03 | 0.09 | 0.16 | 0.24 | 0.32 | 0.37 | 0.33 | 0.32 | 0.27 | 0.24 | 0.17 | 0.17 |
| 2013 | 0.04 | 0.10 | 0.17 | 0.25 | 0.33 | 0.38 | 0.34 | 0.33 | 0.29 | 0.26 | 0.18 | 0.18 |
| 2014 | 0.03 | 0.10 | 0.16 | 0.23 | 0.31 | 0.36 | 0.32 | 0.32 | 0.29 | 0.26 | 0.17 | 0.17 |
| 2015 | 0.03 | 0.10 | 0.15 | 0.22 | 0.29 | 0.34 | 0.30 | 0.30 | 0.26 | 0.23 | 0.14 | 0.14 |
| 2016 | 0.03 | 0.10 | 0.15 | 0.23 | 0.31 | 0.35 | 0.32 | 0.32 | 0.28 | 0.25 | 0.14 | 0.14 |

**Icelandic cod in Division Va. Estimates of numbers at age in the stock 1955-2017 based on ACAM using catch at age and spring and fall bottom survey indices.**

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1955 | 254.572 | 186.604 | 151.968 | 217.559 | 211.739 | 115.303 | 35.992 | 24.517 | 12.911 | 87.011 | 9.155 | 7.765 | 8.081 | 2.627 |
| 1956 | 329.313 | 208.426 | 152.779 | 119.537 | 150.237 | 134.622 | 71.734 | 21.773 | 14.805 | 7.960 | 51.449 | 5.414 | 4.663 | 4.778 |
| 1957 | 431.465 | 269.619 | 170.645 | 118.869 | 81.567 | 95.840 | 85.086 | 43.938 | 13.152 | 9.020 | 4.620 | 29.475 | 3.164 | 2.730 |
| 1958 | 230.091 | 353.254 | 220.745 | 128.819 | 78.506 | 50.789 | 59.791 | 51.561 | 35.115 | 7.757 | 5.128 | 2.623 | 17.278 | 1.917 |
| 1959 | 287.645 | 188.383 | 289.220 | 161.207 | 82.269 | 47.529 | 31.092 | 35.410 | 51.350 | 19.304 | 4.088 | 2.689 | 1.457 | 10.199 |
| 1960 | 192.076 | 235.503 | 154.235 | 216.234 | 104.531 | 50.785 | 30.106 | 18.878 | 20.597 | 37.460 | 10.591 | 2.279 | 1.594 | 0.946 |
| 1961 | 264.592 | 157.259 | 192.814 | 114.184 | 140.224 | 63.733 | 31.059 | 17.579 | 10.383 | 10.984 | 19.025 | 5.384 | 1.266 | 0.993 |
| 1962 | 304.322 | 216.630 | 128.753 | 143.720 | 74.642 | 88.575 | 40.165 | 18.215 | 23.607 | 5.593 | 5.678 | 10.020 | 3.102 | 0.825 |
| 1963 | 322.718 | 249.158 | 177.361 | 94.286 | 91.812 | 46.108 | 55.712 | 23.253 | 9.759 | 12.115 | 2.740 | 2.852 | 5.611 | 1.996 |
| 1964 | 341.841 | 264.219 | 203.993 | 127.552 | 58.167 | 54.145 | 27.715 | 31.094 | 11.636 | 4.443 | 5.197 | 1.200 | 1.469 | 3.447 |
| 1965 | 477.822 | 279.876 | 216.324 | 147.281 | 78.115 | 32.830 | 30.915 | 14.691 | 14.391 | 4.545 | 1.618 | 1.846 | 0.534 | 0.814 |
| 1966 | 256.474 | 391.208 | 229.143 | 156.978 | 90.778 | 43.545 | 17.967 | 15.803 | 6.590 | 5.601 | 1.594 | 0.550 | 0.786 | 0.285 |
| 1967 | 369.256 | 209.983 | 320.294 | 170.760 | 99.751 | 52.844 | 24.347 | 9.004 | 6.946 | 2.473 | 1.836 | 0.477 | 0.206 | 0.378 |
| 1968 | 269.303 | 302.321 | 171.920 | 242.881 | 111.191 | 60.309 | 30.859 | 12.288 | 4.007 | 2.689 | 0.842 | 0.595 | 0.190 | 0.106 |
| 1969 | 281.456 | 220.487 | 247.519 | 130.352 | 155.379 | 64.675 | 32.920 | 41.220 | 4.681 | 1.165 | 0.664 | 0.177 | 0.166 | 0.075 |
| 1970 | 207.772 | 230.437 | 180.519 | 191.640 | 84.594 | 92.138 | 37.159 | 32.898 | 18.366 | 1.868 | 0.413 | 0.228 | 0.071 | 0.087 |
| 1971 | 407.496 | 170.109 | 188.666 | 137.989 | 119.823 | 46.925 | 49.274 | 17.533 | 14.060 | 7.035 | 0.628 | 0.131 | 0.084 | 0.035 |
| 1972 | 267.069 | 333.629 | 139.274 | 141.406 | 82.953 | 60.799 | 22.561 | 21.699 | 23.290 | 5.178 | 2.216 | 0.183 | 0.045 | 0.039 |
| 1973 | 389.159 | 218.657 | 273.152 | 104.463 | 85.617 | 42.043 | 28.623 | 9.649 | 8.567 | 8.647 | 1.627 | 0.631 | 0.061 | 0.020 |
| 1974 | 548.598 | 318.617 | 179.021 | 198.613 | 62.075 | 43.015 | 19.579 | 12.022 | 3.717 | 3.157 | 2.733 | 0.472 | 0.212 | 0.028 |
| 1975 | 213.827 | 449.154 | 260.861 | 130.871 | 117.555 | 30.864 | 19.821 | 7.968 | 4.287 | 1.213 | 0.902 | 0.692 | 0.140 | 0.088 |
| 1976 | 339.556 | 175.067 | 367.736 | 191.676 | 78.629 | 58.265 | 13.865 | 7.887 | 2.697 | 1.267 | 0.323 | 0.213 | 0.192 | 0.054 |
| 1977 | 362.970 | 278.005 | 143.333 | 281.763 | 121.228 | 41.980 | 27.490 | 5.670 | 2.759 | 0.859 | 0.381 | 0.093 | 0.069 | 0.084 |
| 1978 | 209.174 | 297.174 | 227.611 | 113.832 | 189.782 | 71.401 | 22.408 | 12.248 | 2.262 | 1.096 | 0.338 | 0.157 | 0.041 | 0.038 |
| 1979 | 209.118 | 171.257 | 243.306 | 181.345 | 78.325 | 117.298 | 41.029 | 10.859 | 5.498 | 1.075 | 0.521 | 0.172 | 0.083 | 0.026 |
| 1980 | 196.990 | 171.212 | 140.214 | 193.658 | 125.179 | 48.745 | 71.861 | 20.333 | 5.050 | 2.748 | 0.541 | 0.282 | 0.096 | 0.054 |
| 1981 | 345.635 | 161.281 | 140.176 | 111.613 | 133.120 | 75.475 | 27.134 | 47.131 | 8.963 | 2.374 | 1.310 | 0.279 | 0.151 | 0.060 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 | 208.091 | 282.982 | 132.046 | 112.187 | 76.639 | 76.586 | 37.934 | 11.629 | 17.037 | 3.147 | 0.864 | 0.512 | 0.117 | 0.075 |
| 1983 | 210.371 | 170.370 | 231.686 | 105.166 | 75.790 | 42.287 | 35.916 | 15.453 | 3.887 | 5.377 | 1.090 | 0.339 | 0.219 | 0.059 |
| 1984 | 493.802 | 172.238 | 139.487 | 185.286 | 72.030 | 42.561 | 19.890 | 14.540 | 5.255 | 1.283 | 1.896 | 0.435 | 0.145 | 0.110 |
| 1985 | 390.327 | 404.291 | 141.016 | 109.884 | 124.153 | 40.411 | 20.496 | 8.304 | 5.332 | 2.038 | 0.525 | 0.866 | 0.208 | 0.080 |
| 1986 | 262.834 | 319.573 | 331.006 | 109.833 | 71.493 | 66.590 | 18.557 | 8.219 | 2.964 | 2.044 | 0.837 | 0.241 | 0.415 | 0.114 |
| 1987 | 133.331 | 215.190 | 261.644 | 254.845 | 69.230 | 34.892 | 26.652 | 6.664 | 2.598 | 1.020 | 0.784 | 0.360 | 0.110 | 0.218 |
| 1988 | 195.858 | 109.162 | 176.183 | 202.638 | 158.948 | 32.509 | 12.607 | 8.814 | 1.896 | 0.795 | 0.362 | 0.312 | 0.153 | 0.054 |
| 1989 | 160.549 | 160.355 | 89.375 | 137.610 | 128.108 | 76.888 | 11.986 | 4.103 | 2.395 | 0.532 | 0.258 | 0.127 | 0.118 | 0.066 |
| 1990 | 261.378 | 131.446 | 131.288 | 70.267 | 88.478 | 100.048 | 32.645 | 4.434 | 1.376 | 0.892 | 0.216 | 0.114 | 0.058 | 0.061 |
| 1991 | 202.944 | 213.998 | 107.619 | 102.238 | 44.797 | 45.165 | 42.139 | 12.144 | 1.544 | 0.539 | 0.374 | 0.098 | 0.054 | 0.031 |
| 1992 | 117.617 | 166.156 | 175.207 | 80.876 | 61.911 | 20.807 | 16.373 | 14.256 | 3.873 | 0.552 | 0.209 | 0.156 | 0.043 | 0.027 |
| 1993 | 227.008 | 96.296 | 136.037 | 129.505 | 48.084 | 27.808 | 7.118 | 5.322 | 4.298 | 1.321 | 0.208 | 0.085 | 0.067 | 0.021 |
| 1994 | 247.839 | 185.858 | 78.841 | 96.962 | 77.519 | 22.577 | 10.166 | 2.399 | 1.563 | 1.288 | 0.438 | 0.073 | 0.032 | 0.029 |
| 1995 | 133.343 | 202.913 | 152.168 | 59.105 | 62.370 | 43.198 | 10.851 | 4.235 | 0.918 | 0.633 | 0.538 | 0.195 | 0.034 | 0.017 |
| 1996 | 242.130 | 109.172 | 166.131 | 117.186 | 39.826 | 37.125 | 23.172 | 5.034 | 1.862 | 0.434 | 0.299 | 0.270 | 0.101 | 0.019 |
| 1997 | 106.741 | 198.239 | 89.382 | 131.202 | 81.783 | 24.607 | 20.145 | 10.873 | 2.218 | 0.864 | 0.200 | 0.147 | 0.137 | 0.056 |
| 1998 | 256.531 | 87.392 | 162.305 | 71.346 | 93.003 | 50.898 | 13.240 | 9.229 | 4.587 | 0.954 | 0.370 | 0.091 | 0.070 | 0.073 |
| 1999 | 242.611 | 210.030 | 71.551 | 129.129 | 50.151 | 54.865 | 24.866 | 5.616 | 3.510 | 1.712 | 0.360 | 0.147 | 0.039 | 0.033 |
| 2000 | 237.031 | 198.633 | 171.958 | 56.019 | 88.763 | 27.874 | 23.687 | 9.768 | 1.978 | 1.201 | 0.612 | 0.137 | 0.060 | 0.018 |
| 2001 | 266.183 | 194.065 | 162.627 | 132.601 | 38.336 | 49.483 | 12.401 | 9.358 | 3.420 | 0.665 | 0.416 | 0.224 | 0.054 | 0.026 |
| 2002 | 119.728 | 217.932 | 158.887 | 123.556 | 89.803 | 21.462 | 22.814 | 5.122 | 3.352 | 1.114 | 0.218 | 0.141 | 0.083 | 0.022 |
| 2003 | 228.757 | 98.025 | 178.428 | 124.132 | 85.917 | 52.528 | 10.823 | 10.295 | 2.060 | 1.232 | 0.400 | 0.081 | 0.057 | 0.037 |
| 2004 | 199.487 | 187.290 | 80.256 | 140.769 | 87.418 | 50.581 | 26.308 | 4.989 | 4.304 | 0.812 | 0.469 | 0.157 | 0.034 | 0.026 |
| 2005 | 146.450 | 163.326 | 153.340 | 63.605 | 100.034 | 51.697 | 24.639 | 12.028 | 2.067 | 1.682 | 0.309 | 0.183 | 0.066 | 0.016 |
| 2006 | 198.331 | 119.903 | 133.720 | 121.583 | 45.868 | 61.182 | 26.265 | 11.621 | 5.138 | 0.839 | 0.665 | 0.124 | 0.079 | 0.031 |
| 2007 | 180.177 | 162.380 | 98.168 | 106.196 | 88.210 | 28.747 | 31.572 | 12.558 | 5.002 | 2.104 | 0.341 | 0.277 | 0.056 | 0.039 |
| 2008 | 195.976 | 147.517 | 132.945 | 78.227 | 77.970 | 57.268 | 15.965 | 15.784 | 5.578 | 2.074 | 0.867 | 0.143 | 0.126 | 0.027 |
| 2009 | 256.543 | 160.451 | 120.777 | 106.355 | 58.496 | 63.725 | 34.723 | 8.674 | 7.851 | 2.719 | 1.011 | 0.440 | 0.076 | 0.073 |
| 2010 | 274.394 | 210.040 | 131.366 | 96.012 | 79.168 | 39.767 | 38.393 | 18.890 | 4.333 | 3.892 | 1.376 | 0.538 | 0.246 | 0.046 |
| 2011 | 186.372 | 224.655 | 171.966 | 104.662 | 71.865 | 55.035 | 25.233 | 22.033 | 10.146 | 2.378 | 2.171 | 0.809 | 0.327 | 0.161 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2012 | 273.220 | 152.589 | 183.932 | 137.121 | 78.393 | 50.140 | 35.443 | 14.898 | 12.323 | 5.872 | 1.397 | 1.348 | 0.518 | 0.225 |
| 2013 | 241.399 | 223.694 | 124.929 | 146.360 | 102.390 | 54.567 | 32.226 | 21.016 | 8.422 | 7.232 | 3.492 | 0.875 | 0.869 | 0.359 |
| 2014 | 169.714 | 197.641 | 183.145 | 98.390 | 108.412 | 70.654 | 34.775 | 19.055 | 11.814 | 4.908 | 4.247 | 2.142 | 0.553 | 0.595 |
| 2015 | 284.837 | 138.950 | 161.815 | 145.252 | 73.217 | 75.770 | 45.891 | 20.905 | 10.913 | 6.995 | 2.913 | 2.615 | 1.358 | 0.380 |
| 2016 | 280.523 | 233.205 | 113.762 | 128.011 | 107.747 | 51.361 | 49.838 | 28.008 | 12.220 | 6.620 | 4.235 | 1.830 | 1.701 | 0.966 |
| 2017 | 174.951 | 229.673 | 190.932 | 90.370 | 95.135 | 75.793 | 33.416 | 29.982 | 16.091 | 7.253 | 3.935 | 2.616 | 1.172 | 1.207 |

**Icelandic cod in Division Va. Landings (thousand tonnes, average fishing mortality of age groups 5 to 10, recruitment to the fisheries at age 3 (millions), reference fishing biomass (B4+, thousand tonnes), spawning stock biomass (thousand tonnes) at spawning time and harvest ratio.**

| Year | Yield | F5–10 | SSB | Reference biomass | Recruits | Harvest rate |
|---|---|---|---|---|---|---|
| 1955 | 545.250 | 0.29 | 936.957 | 2354.550 | 151.968 | 0.23 |
| 1956 | 486.909 | 0.29 | 791.479 | 2079.670 | 152.779 | 0.23 |
| 1957 | 455.182 | 0.31 | 771.545 | 1876.560 | 170.645 | 0.24 |
| 1958 | 517.359 | 0.35 | 871.819 | 1863.510 | 220.745 | 0.28 |
| 1959 | 459.081 | 0.32 | 849.812 | 1825.050 | 289.220 | 0.25 |
| 1960 | 470.121 | 0.37 | 707.616 | 1752.670 | 154.235 | 0.27 |
| 1961 | 377.291 | 0.36 | 466.533 | 1495.590 | 192.814 | 0.25 |
| 1962 | 388.985 | 0.38 | 568.226 | 1491.700 | 128.753 | 0.26 |
| 1963 | 408.800 | 0.46 | 507.238 | 1314.700 | 177.361 | 0.31 |
| 1964 | 437.012 | 0.55 | 450.537 | 1218.020 | 203.993 | 0.36 |
| 1965 | 387.106 | 0.58 | 317.427 | 1021.880 | 216.324 | 0.38 |
| 1966 | 353.357 | 0.59 | 277.117 | 1031.020 | 229.143 | 0.34 |
| 1967 | 335.721 | 0.56 | 256.385 | 1102.490 | 320.294 | 0.30 |
| 1968 | 381.770 | 0.72 | 221.564 | 1222.650 | 171.920 | 0.31 |
| 1969 | 403.205 | 0.56 | 313.646 | 1325.510 | 247.519 | 0.30 |
| 1970 | 475.077 | 0.61 | 331.062 | 1336.830 | 180.519 | 0.36 |
| 1971 | 444.248 | 0.68 | 242.547 | 1097.930 | 188.666 | 0.40 |
| 1972 | 395.166 | 0.69 | 221.848 | 997.062 | 139.274 | 0.40 |
| 1973 | 369.205 | 0.70 | 245.538 | 843.945 | 273.152 | 0.44 |
| 1974 | 368.133 | 0.76 | 187.230 | 918.545 | 179.021 | 0.40 |
| 1975 | 364.754 | 0.81 | 168.577 | 895.774 | 260.861 | 0.41 |
| 1976 | 346.253 | 0.74 | 138.864 | 955.975 | 367.736 | 0.36 |
| 1977 | 340.086 | 0.59 | 199.152 | 1290.500 | 143.333 | 0.26 |
| 1978 | 329.602 | 0.47 | 212.854 | 1298.840 | 227.611 | 0.25 |
| 1979 | 366.462 | 0.44 | 304.741 | 1398.130 | 243.306 | 0.26 |
| 1980 | 432.237 | 0.49 | 357.419 | 1490.310 | 140.214 | 0.29 |
| 1981 | 465.032 | 0.66 | 264.788 | 1242.870 | 140.176 | 0.37 |
| 1982 | 380.068 | 0.73 | 168.127 | 971.395 | 132.046 | 0.39 |
| 1983 | 298.049 | 0.71 | 131.064 | 792.556 | 231.686 | 0.38 |
| 1984 | 282.022 | 0.64 | 142.138 | 913.317 | 139.487 | 0.31 |
| 1985 | 323.428 | 0.67 | 162.773 | 927.603 | 141.016 | 0.35 |
| 1986 | 364.797 | 0.77 | 195.326 | 855.467 | 331.006 | 0.43 |
| 1987 | 389.915 | 0.86 | 149.477 | 1032.960 | 261.644 | 0.38 |
| 1988 | 377.554 | 0.89 | 167.110 | 1035.360 | 176.183 | 0.36 |
| 1989 | 363.125 | 0.72 | 170.219 | 1004.410 | 89.375 | 0.36 |
| 1990 | 335.316 | 0.70 | 208.954 | 841.679 | 131.288 | 0.40 |
| 1991 | 307.759 | 0.80 | 164.827 | 699.390 | 107.619 | 0.44 |
| 1992 | 264.834 | 0.84 | 152.750 | 552.524 | 175.207 | 0.48 |
| 1993 | 250.704 | 0.86 | 121.603 | 597.698 | 136.037 | 0.42 |
| 1994 | 178.138 | 0.62 | 157.885 | 578.481 | 78.841 | 0.31 |
| 1995 | 168.592 | 0.50 | 178.346 | 560.464 | 152.168 | 0.30 |
| 1996 | 180.701 | 0.50 | 160.307 | 675.467 | 166.131 | 0.27 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1997 | 203.112 | 0.54 | 189.355 | 788.688 | 89.382 | 0.26 |
| 1998 | 243.987 | 0.64 | 201.252 | 727.708 | 162.305 | 0.34 |
| 1999 | 260.147 | 0.72 | 182.945 | 739.798 | 71.551 | 0.35 |
| 2000 | 235.092 | 0.72 | 172.963 | 601.354 | 171.958 | 0.39 |
| 2001 | 236.705 | 0.72 | 171.565 | 686.565 | 162.627 | 0.34 |
| 2002 | 209.537 | 0.63 | 201.024 | 729.368 | 158.887 | 0.29 |
| 2003 | 207.246 | 0.59 | 193.265 | 744.541 | 178.428 | 0.28 |
| 2004 | 228.337 | 0.60 | 201.184 | 804.839 | 80.256 | 0.28 |
| 2005 | 213.865 | 0.57 | 228.840 | 722.745 | 153.340 | 0.30 |
| 2006 | 197.247 | 0.55 | 220.981 | 696.877 | 133.720 | 0.28 |
| 2007 | 171.646 | 0.52 | 207.098 | 677.413 | 98.168 | 0.25 |
| 2008 | 147.668 | 0.40 | 263.861 | 698.956 | 132.945 | 0.21 |
| 2009 | 183.302 | 0.40 | 250.112 | 786.507 | 120.777 | 0.23 |
| 2010 | 170.009 | 0.33 | 288.159 | 847.814 | 131.366 | 0.20 |
| 2011 | 172.207 | 0.30 | 358.182 | 901.929 | 171.966 | 0.19 |
| 2012 | 196.177 | 0.29 | 404.550 | 1033.820 | 183.932 | 0.19 |
| 2013 | 223.594 | 0.30 | 440.439 | 1166.220 | 124.929 | 0.19 |
| 2014 | 221.990 | 0.28 | 413.113 | 1176.950 | 183.145 | 0.19 |
| 2015 | 230.229 | 0.27 | 532.915 | 1263.480 | 161.815 | 0.18 |
| 2016 | 251.134 | 0.28 | 472.782 | 1329.700 | 113.762 | 0.19 |
| 2017 | NA | NA | 616.906 | 1355.719 | 190.932 | NA |
| 2018 | NA | NA | NA | NA | 188.040 | NA |
| 2019 | NA | NA | NA | NA | 117.273 | NA |

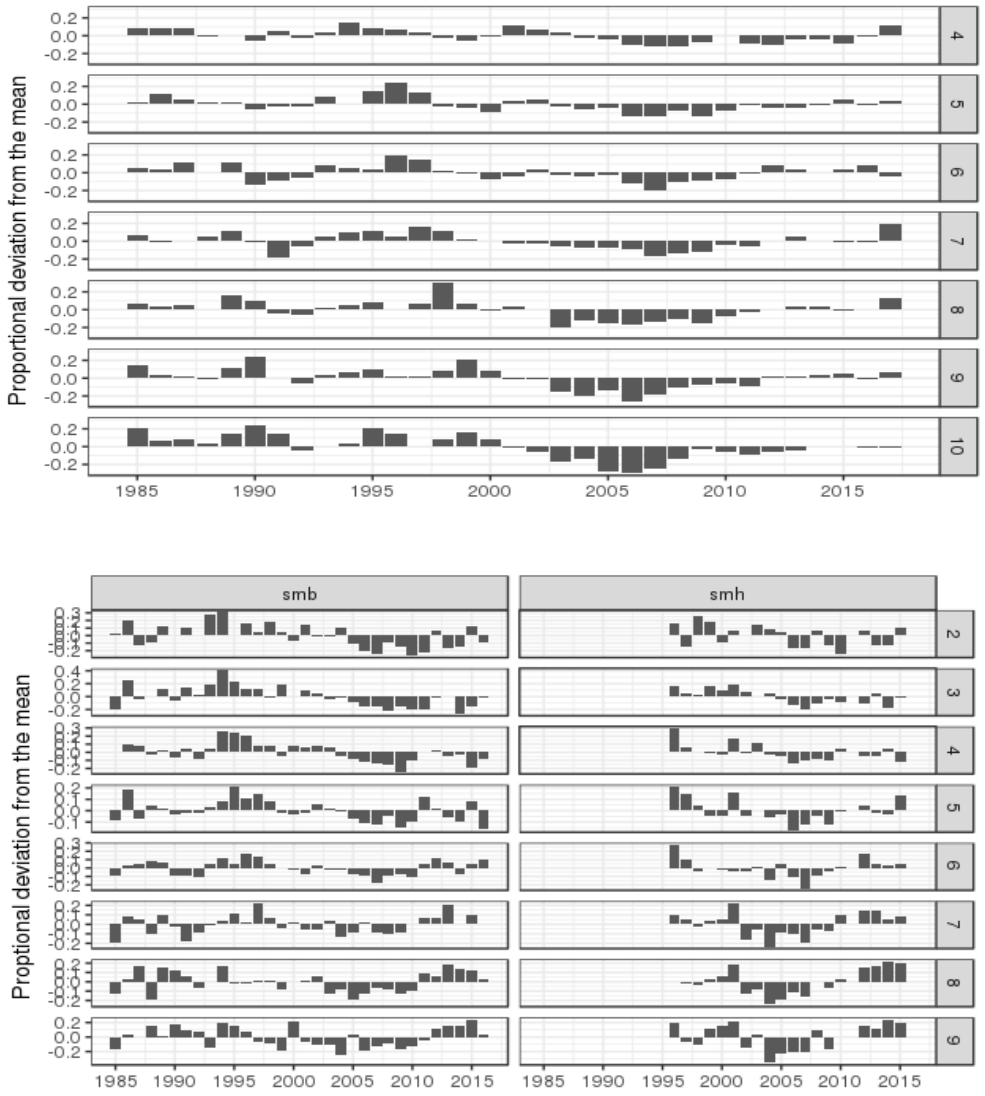
**Icelandic cod in Division Va. Inputs in the deterministic predictions.**

| Age | 2017 | 2018 | 2019 | 2020 | Parameter |
|---|---|---|---|---|---|
| 3 | 1.099 | 1.296 | 1.296 | 1.296 | Catch weights |
| 4 | 1.786 | 2.013 | 2.013 | 2.013 | Catch weights |
| 5 | 2.508 | 2.646 | 2.646 | 2.646 | Catch weights |
| 6 | 3.804 | 3.348 | 3.348 | 3.348 | Catch weights |
| 7 | 4.617 | 5.531 | 5.531 | 5.531 | Catch weights |
| 8 | 5.944 | 6.682 | 6.682 | 6.682 | Catch weights |
| 9 | 7.163 | 7.689 | 7.689 | 7.689 | Catch weights |
| 10 | 8.487 | 8.487 | 8.487 | 8.487 | Catch weights |
| 11 | 10.113 | 10.113 | 10.113 | 10.113 | Catch weights |
| 12 | 10.695 | 10.695 | 10.695 | 10.695 | Catch weights |
| 13 | 11.365 | 11.365 | 11.365 | 11.365 | Catch weights |
| 14 | 13.904 | 13.904 | 13.904 | 13.904 | Catch weights |
| 3 | 1.773 | 1.773 | 1.773 | 1.773 | SSB weights |
| 4 | 2.582 | 2.582 | 2.582 | 2.582 | SSB weights |
| 5 | 3.513 | 3.513 | 3.513 | 3.513 | SSB weights |
| 6 | 3.935 | 3.935 | 3.935 | 3.935 | SSB weights |
| 7 | 5.697 | 5.697 | 5.697 | 5.697 | SSB weights |
| 8 | 6.715 | 6.715 | 6.715 | 6.715 | SSB weights |
| 9 | 7.636 | 7.636 | 7.636 | 7.636 | SSB weights |
| 10 | 9.698 | 9.698 | 9.698 | 9.698 | SSB weights |

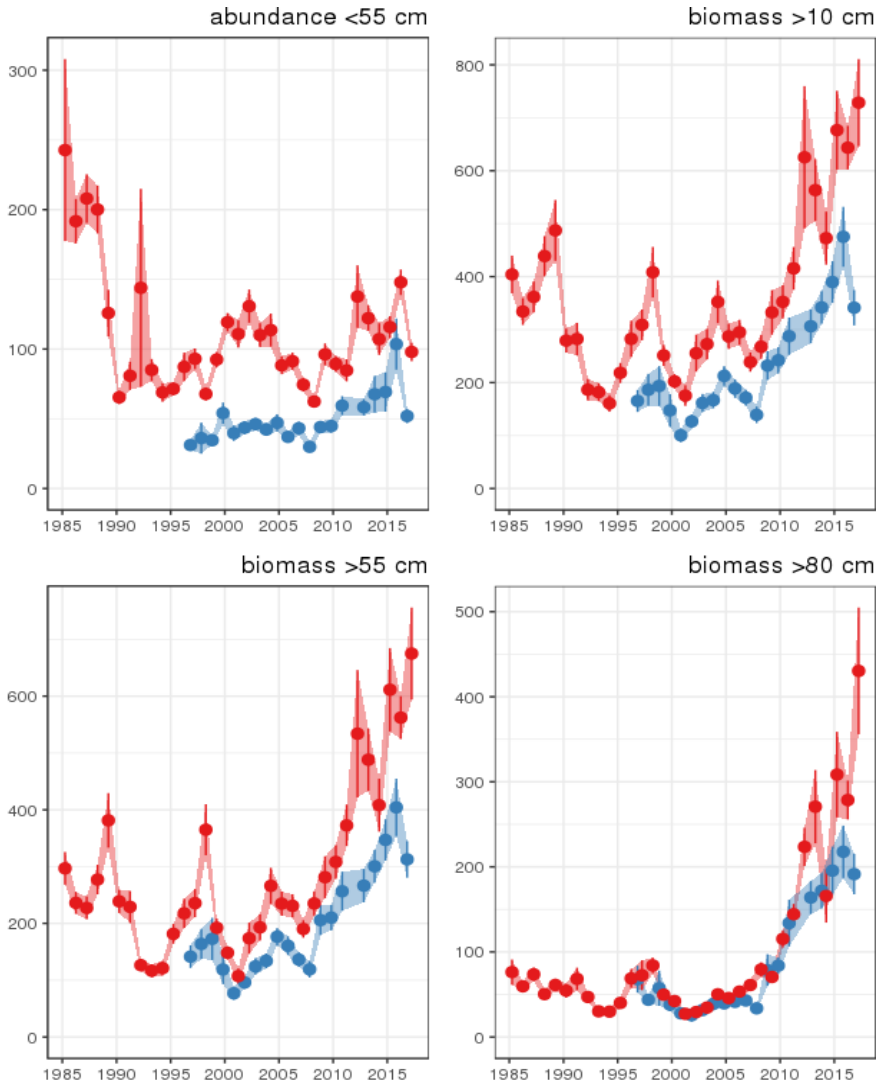
| | | | | | |
|---|---|---|---|---|---|
| 11 | 9.973 | 9.973 | 9.973 | 9.973 | SSB weights |
| 12 | 10.487 | 10.487 | 10.487 | 10.487 | SSB weights |
| 13 | 11.428 | 11.428 | 11.428 | 11.428 | SSB weights |
| 14 | 13.712 | 13.712 | 13.712 | 13.712 | SSB weights |
| 3 | 0.005 | 0.005 | 0.005 | 0.005 | Maturity |
| 4 | 0.008 | 0.008 | 0.008 | 0.008 | Maturity |
| 5 | 0.089 | 0.089 | 0.089 | 0.089 | Maturity |
| 6 | 0.262 | 0.262 | 0.262 | 0.262 | Maturity |
| 7 | 0.765 | 0.765 | 0.765 | 0.765 | Maturity |
| 8 | 0.906 | 0.906 | 0.906 | 0.906 | Maturity |
| 9 | 0.979 | 0.979 | 0.979 | 0.979 | Maturity |
| 10 | 0.987 | 0.987 | 0.987 | 0.987 | Maturity |
| 11 | 1.000 | 1.000 | 1.000 | 1.000 | Maturity |
| 12 | 1.000 | 1.000 | 1.000 | 1.000 | Maturity |
| 13 | 1.000 | 1.000 | 1.000 | 1.000 | Maturity |
| 14 | 1.000 | 1.000 | 1.000 | 1.000 | Maturity |
| 3 | 0.116 | 0.116 | 0.116 | 0.116 | Selection |
| 4 | 0.350 | 0.350 | 0.350 | 0.350 | Selection |
| 5 | 0.558 | 0.558 | 0.558 | 0.558 | Selection |
| 6 | 0.817 | 0.817 | 0.817 | 0.817 | Selection |
| 7 | 1.094 | 1.094 | 1.094 | 1.094 | Selection |
| 8 | 1.260 | 1.260 | 1.260 | 1.260 | Selection |
| 9 | 1.136 | 1.136 | 1.136 | 1.136 | Selection |
| 10 | 1.134 | 1.134 | 1.134 | 1.134 | Selection |
| 11 | 0.745 | 0.745 | 0.745 | 0.745 | Selection |
| 12 | 0.745 | 0.745 | 0.745 | 0.745 | Selection |
| 13 | 0.745 | 0.745 | 0.745 | 0.745 | Selection |
| 14 | 0.745 | 0.745 | 0.745 | 0.745 | Selection |
| 3 | 190.932 | 188.040 | 117.273 | 0.000 | Stock numbers |
| 4 | 90.370 | NA | NA | NA | Stock numbers |
| 5 | 95.135 | NA | NA | NA | Stock numbers |
| 6 | 75.793 | NA | NA | NA | Stock numbers |
| 7 | 33.416 | NA | NA | NA | Stock numbers |
| 8 | 29.982 | NA | NA | NA | Stock numbers |
| 9 | 16.091 | NA | NA | NA | Stock numbers |
| 10 | 7.253 | NA | NA | NA | Stock numbers |
| 11 | 3.935 | NA | NA | NA | Stock numbers |
| 12 | 2.616 | NA | NA | NA | Stock numbers |
| 13 | 1.172 | NA | NA | NA | Stock numbers |
| 14 | 1.207 | NA | NA | NA | Stock numbers |

**Icelandic cod in Division Va. Output of the deterministic predictions.**

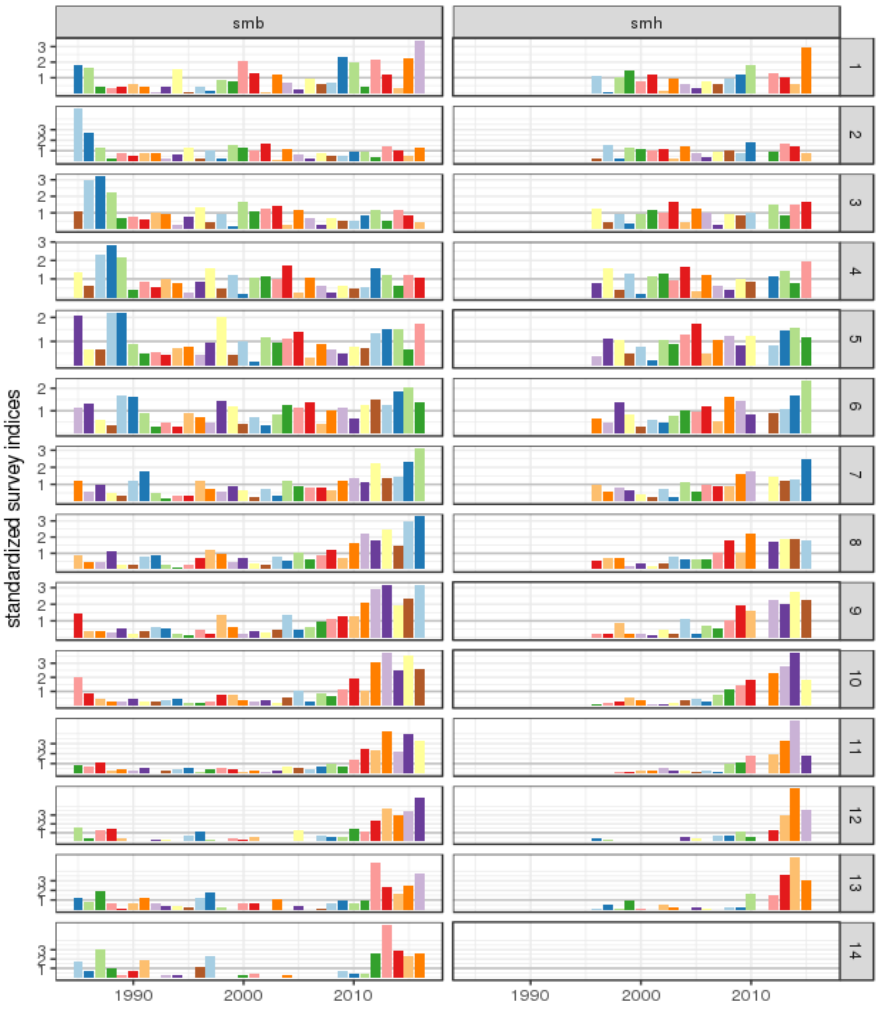
| Year | B4+ | Fmult | Fbar | SSB | Landings | 2019 B4+ | 2019 SSB | SSB change | TAC change |
|---|---|---|---|---|---|---|---|---|---|
| 2017 | 1355.719 | NA | NA | NA | NA | NA | NA | NA | NA |
| 2018 | 1444.190 | 0.0000000 | 0.00 | 728.0256 | 0.00000 | 1816.539 | 964.7745 | 0.3251931 | -1.0000000 |
| NA | NA | 0.2272246 | 0.06 | 709.0080 | 64.52416 | 1743.124 | 886.3000 | 0.2500563 | -0.7429317 |
| NA | NA | 0.2650954 | 0.07 | 705.8904 | 74.94526 | 1731.272 | 873.8926 | 0.2380005 | -0.7014133 |
| NA | NA | 0.3029662 | 0.08 | 702.7873 | 85.27379 | 1719.526 | 861.6695 | 0.2260743 | -0.6602638 |
| NA | NA | 0.3408370 | 0.09 | 699.6989 | 95.51065 | 1707.887 | 849.6275 | 0.2142760 | -0.6194795 |
| NA | NA | 0.3787077 | 0.10 | 696.6249 | 105.65677 | 1696.352 | 837.7641 | 0.2026044 | -0.5790567 |
| NA | NA | 0.4165785 | 0.11 | 693.5654 | 115.71305 | 1684.920 | 826.0765 | 0.1910579 | -0.5389918 |
| NA | NA | 0.4544493 | 0.12 | 690.5202 | 125.68040 | 1673.591 | 814.5619 | 0.1796352 | -0.4992813 |
| NA | NA | 0.4923201 | 0.13 | 687.4893 | 135.55970 | 1662.364 | 803.2177 | 0.1683349 | -0.4599215 |
| NA | NA | 0.5301908 | 0.14 | 684.4726 | 145.35183 | 1651.237 | 792.0413 | 0.1571556 | -0.4209090 |
| NA | NA | 0.5680616 | 0.15 | 681.4701 | 155.05767 | 1640.209 | 781.0301 | 0.1460959 | -0.3822404 |
| NA | NA | 0.6059324 | 0.16 | 678.4816 | 164.67806 | 1629.280 | 770.1816 | 0.1351547 | -0.3439121 |
| NA | NA | 0.6438032 | 0.17 | 675.5072 | 174.21386 | 1618.449 | 759.4932 | 0.1243304 | -0.3059209 |
| NA | NA | 0.6816739 | 0.18 | 672.5467 | 183.66593 | 1607.714 | 748.9626 | 0.1136218 | -0.2682632 |
| NA | NA | 0.7195447 | 0.19 | 669.6000 | 193.03507 | 1597.075 | 738.5873 | 0.1030276 | -0.2309360 |
| NA | NA | 0.7574155 | 0.20 | 666.6672 | 202.32214 | 1586.530 | 728.3650 | 0.0925466 | -0.1939357 |
| NA | NA | 0.7952863 | 0.21 | 663.7481 | 211.52793 | 1576.079 | 718.2932 | 0.0821774 | -0.1572592 |
| NA | NA | 0.8331570 | 0.22 | 660.8427 | 220.65326 | 1565.720 | 708.3698 | 0.0719189 | -0.1209033 |
| NA | NA | 0.8710278 | 0.23 | 657.9509 | 229.69893 | 1555.453 | 698.5924 | 0.0617698 | -0.0848648 |
| NA | NA | 0.9088986 | 0.24 | 655.0726 | 238.66572 | 1545.278 | 688.9588 | 0.0517288 | -0.0491406 |
| NA | NA | 0.9467694 | 0.25 | 652.2078 | 247.55442 | 1535.192 | 679.4667 | 0.0417948 | -0.0137274 |
| NA | NA | 0.9846401 | 0.26 | 649.3565 | 256.36580 | 1525.195 | 670.1142 | 0.0319666 | 0.0213777 |
| NA | NA | 1.0225109 | 0.27 | 646.5184 | 265.10063 | 1515.287 | 660.8989 | 0.0222429 | 0.0561778 |
| NA | NA | 1.0603817 | 0.28 | 643.6936 | 273.75967 | 1505.466 | 651.8188 | 0.0126227 | 0.0906760 |
| NA | NA | 1.0982525 | 0.29 | 640.8821 | 282.34366 | 1495.731 | 642.8719 | 0.0031048 | 0.1248751 |
| NA | NA | 1.1361232 | 0.30 | 638.0837 | 290.85335 | 1486.082 | 634.0561 | -0.0063119 | 0.1587783 |
| NA | NA | 1.1739940 | 0.31 | 635.2983 | 299.28947 | 1476.517 | 625.3695 | -0.0156287 | 0.1923883 |
| NA | NA | 1.2118648 | 0.32 | 632.5260 | 307.65275 | 1467.037 | 616.8100 | -0.0248465 | 0.2257082 |
| NA | NA | 1.2497356 | 0.33 | 629.7667 | 315.94391 | 1457.640 | 608.3757 | -0.0339665 | 0.2587407 |
| NA | NA | 1.2876063 | 0.34 | 627.0202 | 324.16365 | 1448.325 | 600.0647 | -0.0429898 | 0.2914886 |
| NA | NA | 1.3254771 | 0.35 | 624.2866 | 332.31268 | 1439.091 | 591.8752 | -0.0519174 | 0.3239549 |
| NA | NA | 1.3633479 | 0.36 | 621.5657 | 340.39171 | 1429.938 | 583.8053 | -0.0607505 | 0.3561423 |
| NA | NA | 1.4012187 | 0.37 | 618.8576 | 348.40140 | 1420.865 | 575.8531 | -0.0694900 | 0.3880534 |
| NA | NA | 1.4390894 | 0.38 | 616.1620 | 356.34246 | 1411.871 | 568.0170 | -0.0781370 | 0.4196911 |
| NA | NA | 1.4769602 | 0.39 | 613.4791 | 364.21555 | 1402.955 | 560.2950 | -0.0866926 | 0.4510580 |
| NA | NA | 1.5148310 | 0.40 | 610.8087 | 372.02134 | 1394.116 | 552.6856 | -0.0951577 | 0.4821567 |
| NA | NA | 1.5527018 | 0.41 | 608.1507 | 379.76049 | 1385.355 | 545.1869 | -0.1035333 | 0.5129900 |
| NA | NA | 1.5905725 | 0.42 | 605.5052 | 387.43366 | 1376.669 | 537.7973 | -0.1118204 | 0.5435604 |
| NA | NA | 1.6284433 | 0.43 | 602.8720 | 395.04149 | 1368.059 | 530.5152 | -0.1200201 | 0.5738705 |
| NA | NA | 1.6663141 | 0.44 | 600.2511 | 402.58461 | 1359.523 | 523.3389 | -0.1281333 | 0.6039228 |
| NA | NA | 1.7041849 | 0.45 | 597.6423 | 410.06368 | 1351.061 | 516.2668 | -0.1361609 | 0.6337198 |
| NA | NA | 1.7420556 | 0.46 | 595.0458 | 417.47930 | 1342.672 | 509.2974 | -0.1441038 | 0.6632642 |



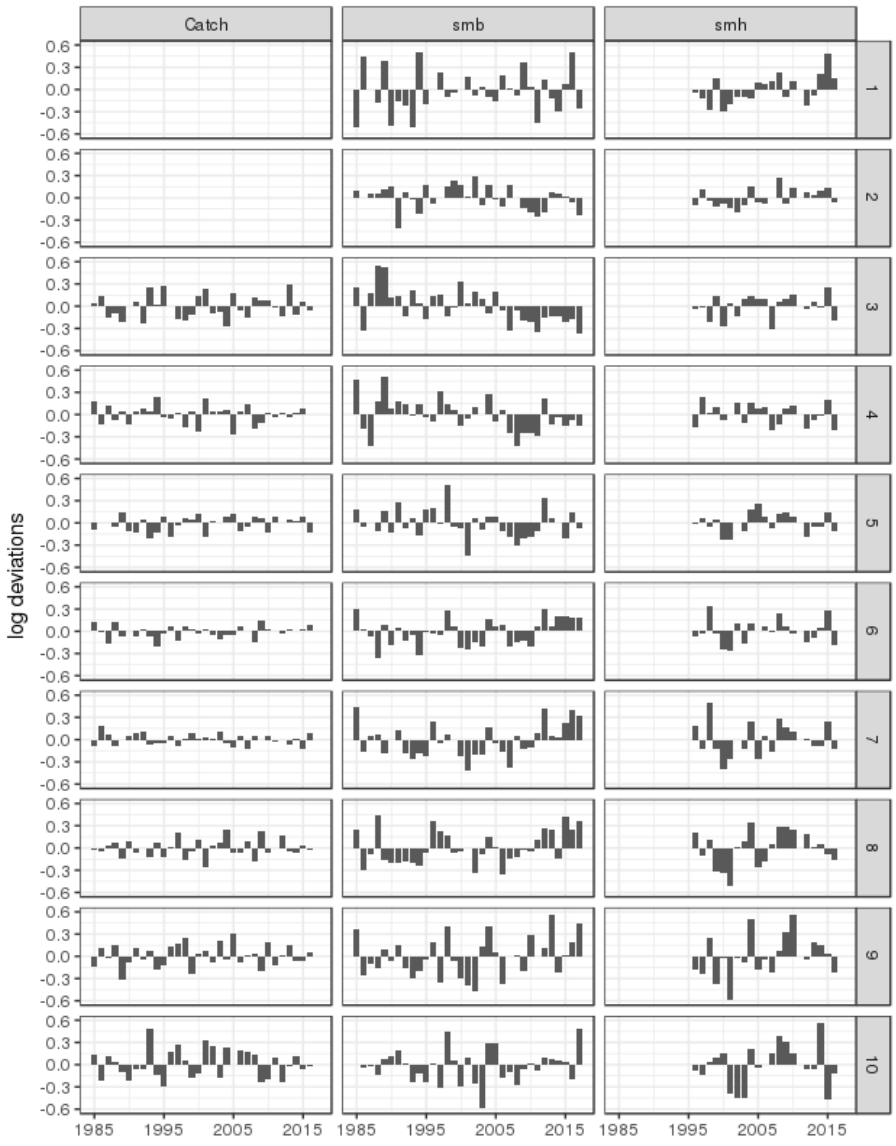

**Icelandic cod division Va. Estimated weight at age (numbers in panel indicate age classes) in the spring survey (SMB) and fall survey (SMH) expressed as proportional deviations from the mean. No fall survey was conducted in 2011. Note that values that are equal to the mean are not visible in this type of a plot.**



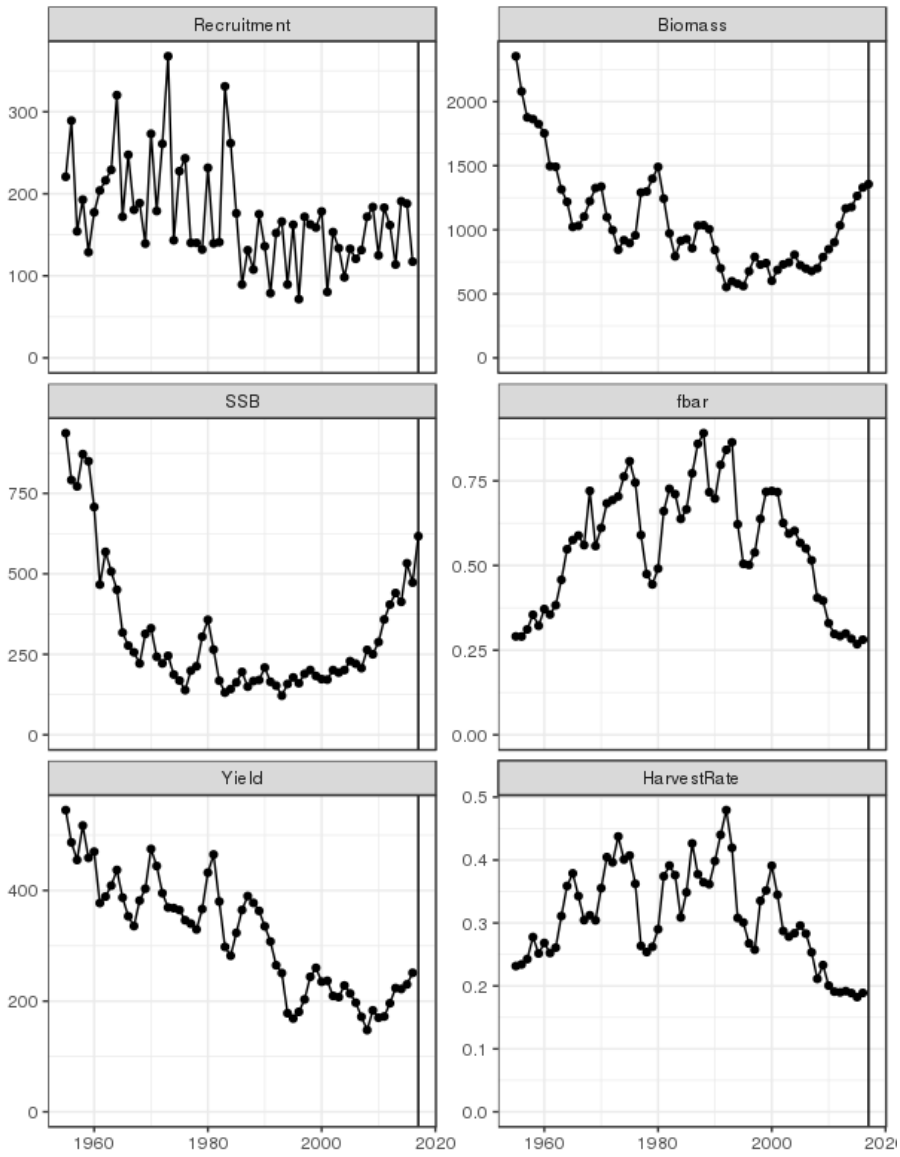

**Icelandic cod division Va. Indices of cod in the spring (SMB, red) and fall (SMH, blue) groundfish surveys. Total biomass index (top right), biomass index of 55 cm and larger (bottom right), biomass index 80 cm and larger (bottom right) and abundance index of < 55 cm, (top left). The shaded area and the vertical bar show 1 standard error of the estimate.**



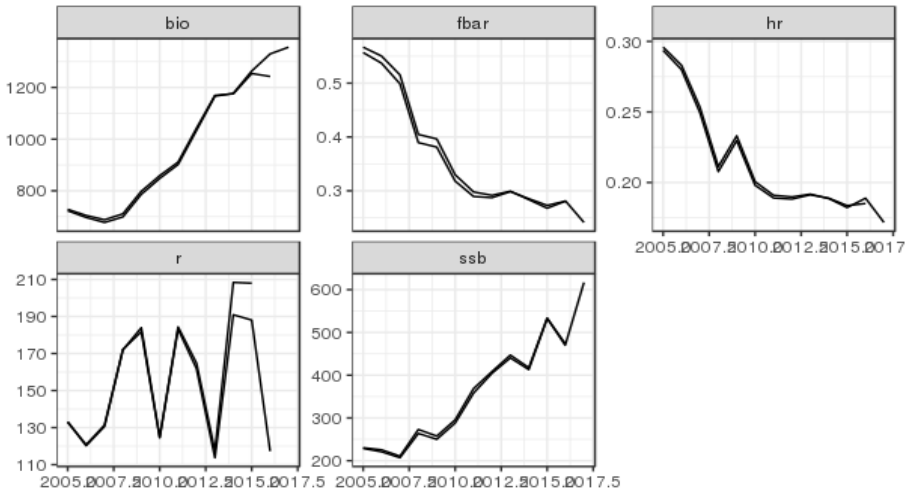

**Icelandic cod division Va. Age based abundance indices of cod in the groundfish survey in spring (SMB) and fall (SMH). The indices are standardized within each age group and within each survey.**




**Catch residuals (left), spring survey residuals (SMB, middle) and fall survey residuals (SMH, right) by year and age from the spaly ADCAM run. Note that values that are equal to the mean are not visible in this type of a plot and that no survey was carried out in the fall 2011.**




**Icelandic cod in division Va. Assessment summary based ADCAM tuned with the spring and the fall survey. The x-axis for the recruitment refer to the year class**




**Icelandic cod in division Va. Comparison with last years assessment**