

Cod (*Gadus morhua*) in Division 7.a (Irish Sea)

ICES advice on fishing opportunities

Please note: This advice was updated in November 2020 (ICES, 2020)

ICES advises that when the precautionary approach is applied, catches in 2021 should be no more than 108 tonnes.

Note: This advice sheet is abbreviated due to the COVID-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time

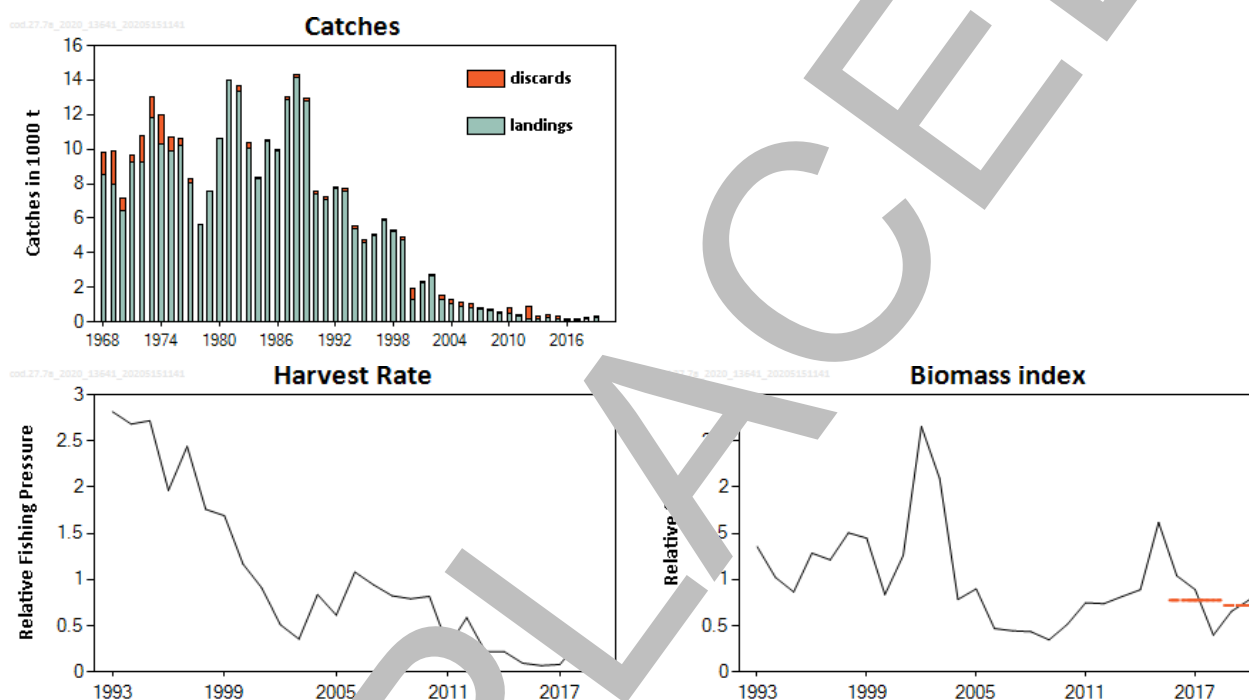


Figure 1 Cod in Division 7.a. Summary of the stock. The biomass index (NIGFS-WIBTS_Q1 up to 2020) is used as an indicator of stock size. The shaded ranges indicate the average of the biomass index for 2016–2018 and 2019–2020. Harvest rate is calculated as catch divided by survey index. Discard estimates are available since 2007; prior to 2007, discards are reconstructed.

Stock and exploitation status

Table 1 Cod in Division 7.a. State of the stock and the fishery relative to reference points.

		Fishing pressure				Stock size			
		2017	2018	2019		2018	2019	2020	
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	Undefined
Management plan	F_{MGT}	?	?	?	Undefined	B_{MGT}	?	?	Undefined
Qualitative evaluation	-	✓	✓	✓	Below possible reference points	-	↘	↗	↗ Increasing

Catch scenarios

The precautionary buffer was applied in 2019 and its application has, therefore, not been considered again. The average discard rate (2015–2019) was 30%.

Table 2 Cod in Division 7.a. The basis for catch scenarios. *

Index A (2019, 2020)		0.72
Index B (2016, 2017, 2018)		0.78
Index ratio (A/B)		0.93
Uncertainty cap	Not applied	-
Advised catch for 2020		116 tonnes
Precautionary buffer	Not applied	-
Catch advice **		108 tonnes
Discard rate (2015–2019)		0.30
Projected landings corresponding to advice		76 tonnes
% change in advice ***		-6.9

* The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

** [Advice for 2020] × [index ratio].

*** Advice for 2021 relative to the advice for 2020.

History of the advice, catch, and management

Table 3 Cod in Division 7.a. ICES advice and official landings. All weights in tonnes.

Year	ICES advice, with single-stock exploitation boundaries since 2004	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings ***	ICES discards
1987	No increase in F; interaction with <i>Nephrops</i>	10300	15000	13200	12900	
1988	No increase in F; interaction with <i>Nephrops</i>	10100	15000	15800	14200	
1989	No increase in F	13400	15000	11300	12800	
1990	F at F_{med} ; TAC	15300	15300	9900	7400	
1991	Stop SSB decline; TAC	6000	10000	7000	7100 **	
1992	20% of $F(90)$ ~ 10 000 tonnes	10000	10000	7400	7700 **	
1993	F_{med} ~ 10 200 tonnes	10200	11000	5900	7600 **	
1994	60% reduction in F	3700	6200	4500	5400 **	
1995	50% reduction in F	3900	5800	4500	4600 **	
1996	30% reduction in F	5400	6200	5303	4964 **	
1997	30% reduction in F	5900	6200	4441	5859 **	
1998	No increase in F	6200	7100	4962	5318 **	
1999	Reduce F below F_{med}	4900	5500	2875	4784 **	
2000	Lowest possible F	0	2100	1417	1274	
2001	Lowest possible F	0	2100	2026	2252	
2002	Establish recovery plan	-	3200	2715	2695	
2003	Closure of all fisheries for cod	-	1950	1477	1285	
2004	Zero catch	0	2150	1179	1072	
2005	Zero catch	0	2150	967	910	
2006	Zero catch	0	1828	948	840	
2007	Zero catch	0	1462	1117	702	148
2008	Zero catch	0	1199	1224	661	62
2009	Zero catch	0	899	754	468	60
2010	Zero catch	0	674	594	464	377
2011	Zero catch	0	506	485	368	43
2012	Zero catch	0	380	326	198	658
2013	No directed fisheries, minimize bycatch and discards	0	285	281	206	118
2014	No directed fisheries, minimize bycatch and discards	0	228	236	213	149

Year	ICES advice, with single-stock exploitation boundaries since 2004	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings ***	ICES discards
2015	No directed fisheries, minimize bycatch and discards	0	182	199	161	224
2016	No directed fisheries, minimize bycatch and discards	0	146	122	82	60
2017	MSY approach	0	146	103	84	59
2018	MSY approach	≤ 1073	695	235 *	215	42
2019	MSY approach	≤ 807	807		295	7
2020	Precautionary approach	≤ 116	257			
2021	Precautionary approach	≤ 108				

* Preliminary.

** Includes sample-based estimates of landings into three ports.

*** Excludes landings reported from rectangles 33E2 and 33E3 since 2004.

Summary of the assessment

Table 4 Cod in Division 7.a. Assessment summary. Weights are in tonnes.

Year	Relative biomass index	Landings	Discards *	Relative harvest rate
1968		8541	1715	
1969		7991	1598	
1970		6421	708	
1971		9241	363	
1972		9234	1546	
1973		11819	1222	
1974		10251	1749	
1975		10263	857	
1976		10247	381	
1977		8051	201	
1978		5112	0	
1979		148	0	
1980		10110	0	
1981		13951	0	
1982		17151	313	
1983		1015	372	
1984		8383	2	
1985		10483	61	
1986		9852	154	
1987		12894	128	
1988		14168	109	
1989		12751	202	
1990		7379	159	
1991		7095	163	
1992		7735	98	
1993	1.35	7555	155	2.8
1994	1.12	5402	142	2.7
1995	0.87	4587	166	2.7
1996	1.29	4964	140	1.96
1997	1.21	5859	120	2.4
1998	1.50	5318	29	1.76
1999	1.45	4784	159	1.69
2000	0.84	1274	699	1.17
2001	1.26	2252	64	0.91
2002	2.7	2695	46	0.51
2003	2.1	1285	215	0.35
2004	0.78	1072	254	0.84
2005	0.90	910	204	0.61
2006	0.47	840	185	1.08
2007	0.44	702	145	0.94

Year	Relative biomass index	Landings	Discards *	Relative harvest rate
2008	0.43	662	61	0.82
2009	0.35	466	88	0.79
2010	0.51	464	386	0.82
2011	0.75	365	48	0.27
2012	0.74	198	678	0.59
2013	0.82	206	152	0.22
2014	0.89	213	1	0.22
2015	1.62	161	47	0.094
2016	1.04	82	60	0.068
2017	0.89	84	59	0.080
2018	0.40	215	7	0.32
2019	0.66	295	7	0.23
2020	0.78			

* Discards prior to 2007 are reconstructed.

Sources and references

ICES. 2020. Working Group for the Celtic Seas Ecoregion (WGCSF) draft report. ICES Scientific Reports. 2:40. Xx pp. <http://doi.org/10.17895/ices.pub.5978>. Publication of the full report is expected end of 2020.

ICES. 2020b. Cod (*Gadus morhua*) in Division 7.a (Irish Sea). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, cod.27.7a. <https://doi.org/10.17895/ices.advice.7570>.

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Annex 1

ICES Advice on fishing opportunities, catch, and effort
Celtic Seas Ecoregion
Published 28 June 2019

Cod (*Gadus morhua*) in Division 7.a (Irish Sea)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2020 should be no more than 116 tonnes.

Stock development over time

The biomass index is fluctuating without trend and has recently decreased to the lowest value in the time-series. The harvest rate has been decreasing since the 1990s, and increased in 2018. Catches since 2000 have been low and decreasing.

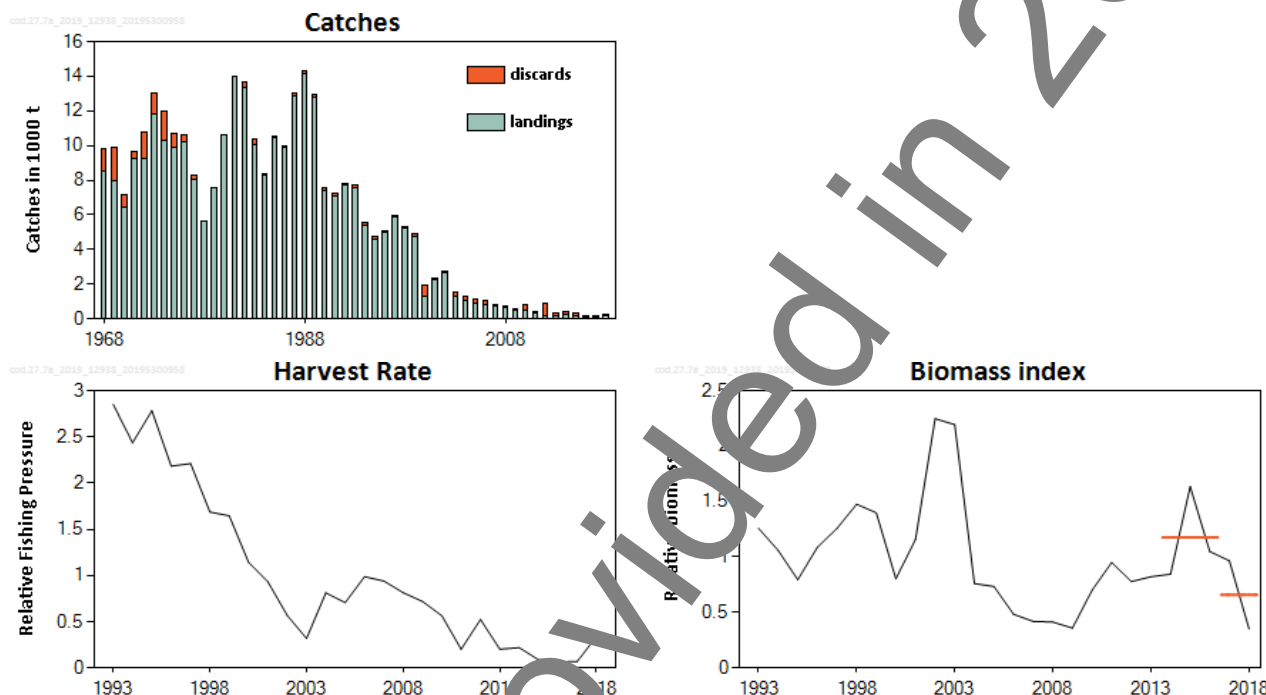


Figure 1 Cod in Division 7.a. summary of the stock assessment. The biomass index (NIGFS-WIBTS-Q1) is used as an indicator of stock size. The short orange lines indicate the average of the biomass index for 2014–2016 and 2017–2018. Harvest rate is calculated as catches divided by survey index.

Stock and exploitation status

ICES cannot assess the stock and exploitation status relative to the maximum sustainable yield (MSY) and precautionary approach (PA) reference points, because the reference points are undefined.

Table 1 Cod in Division 7.a. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size				
		2016	2017	2018		2016	2017	2018		
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	MSY	?	?	?	Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	?	Undefined	B_{pa}, B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	?	?	?	Undefined	B_{MGT}	?	?	?	Undefined
Qualitative evaluation	-	✓	✓	✓	Below possible reference points	-	↘	↘	↘	Decreasing

Catch scenarios

The ICES framework for category 3 stocks was applied (ICES, 2012). The Northern Ireland Groundfish Quarterly WIBTS Survey was used as an index of stock development. The advice is based on the ratio of the mean of the last two index values (Index A) and the mean of the three preceding values (Index B) multiplied by the recent average catch (2016–2018). The index is estimated to have decreased by more than 20% and thus the uncertainty cap was applied. The stock status relative to candidate reference points is unknown, therefore the precautionary buffer was applied to the advice. The precautionary buffer has not been applied to this stock before because it was in ICES category 1 and consequently is applied this year.

Table 2 Cod in Division 7.a. The basis for catch scenarios.*

Index A (2017, 2018)		0.66
Index B (2014, 2015, 2016)		1.18
Index ratio (A/B)		0.56
Uncertainty cap	Applied	0.8
Catch average (2016–2018)		181 tonnes
Precautionary buffer	Applied	0.8
Catch advice **		116 tonnes
% change in advice ^		-86%

* The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.

** $[(\text{Catch average 2016–2018}) \times (\text{uncertainty cap})] \times (\text{precautionary buffer})$.

^ Advice for 2020 relative to the advice for 2019.

Basis of the advice

Table 3 Cod in Division 7.a. The basis of the advice.

Advice basis	Precautionary approach
Management plan	<p>The European Parliament and the Council have published a multiannual management plan (MAP) for the Western Waters (EU, 2019). This plan applies to demersal stocks including cod in ICES Division 7.a.</p> <p>The MAP stipulates that when the MSY ranges are not available the precautionary approach should be applied.</p>

Quality of the assessment

In 2017 and 2018, an Age Structured Assessment Programme (ASAP) model was used to provide advice as a category 1 stock. There is a strong tendency for the assessment to overestimate SSB and underestimate F. The magnitude of the bias is such that the quantitative assessment cannot be used to predict the impact of catches on stock.

As a result, this advice is based on the biomass of the Q1 NIGFS-WIBTS as an indicator of stock size under a category 3 approach. This survey index demonstrates adequate year class tracking and is broadly consistent with the composition of the catches.

Issues relevant for the advice

The assessment and the advice are for Division 7.a, excluding the rectangles 33E2 and 33E3 in the Irish Sea.

The assessment was not of sufficient quality to be retained as a category 1 assessment. The basis for the advice is the ICES precautionary approach (category 3 assessment).

Landings have been adjusted since 2003, to exclude those taken from the southern rectangles (33E2 and 33E3) in the Irish Sea, they are not believed to be part of this stock (Table 7) but rather of the stock in divisions 7.e–k (western English Channel and southern Celtic Seas). Thus, the assessment and the advice exclude these two southern rectangles for the present stock but include them in the assessment and advice for cod in divisions 7.e–k. This should be considered when setting TACs for the two management areas for cod in divisions 7.a and 7.e–k. This amounts to an average of 18% of total

Irish Sea landings being re-allocated over the past 5 years and accounts for 14.3% of official landings in divisions 7.e-k over the past 5 years.

Reference points

The reference points previously defined for this stock (ICES 2018a) are based on an assessment that is no longer considered appropriate for providing advice.

Basis of the assessment

Table 4 Cod in Division 7.a. Basis of assessment and advice.

ICES stock data category	3 (ICES, 2018b).
Assessment type	Survey trends (ICES, 2019)
Input data	Northern Ireland quarter 1 groundfish survey (NIGFS-WIBTS-Q1) survey biomass index (ages 1–4)
Discards and bycatch	Discard information available since 2007, prior to 2007 estimated through raising procedures
Indicators	None.
Other information	This stock was benchmarked in 2017 (WKIRISH; ICES, 2017). Reference points were redefined in 2018
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

No additional information is available for this stock.

History of the advice, catch, and management

Table 5 Cod in Division 7.a. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice / single-stock exploitation boundaries since 2004	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings ^a	ICES discards
1987	No increase in F; interaction with <i>Nephrops</i>	10300	15000	13200	12900	
1988	No increase in F; interaction with <i>Nephrops</i>	10100	15000	15800	14200	
1989	No increase in F	13400	15000	11300	12800	
1990	F at F_{med} ; TAC	15300	15300	9900	7400	
1991	Stop SSB decline; TAC	6000	10000	7000	7100**	
1992	20% of $F(90) \sim 10\,000\text{ t}$	10000	10000	7400	7700**	
1993	$F_{med} \sim 10\,200\text{ t}$	10200	11000	5900	7600**	
1994	60% reduction in F	3700	6200	4500	5400**	
1995	50% reduction in F	3900	5800	4500	4600**	
1996	30% reduction in F	5400	6200	5303	4964**	
1997	30% reduction in F	5900	6200	4441	5859**	
1998	No increase in F	6200	7100	4962	5318**	
1999	Reduce F below F_{pa}	4900	5500	2875	4784**	
2000	Lowest possible F	0	2100	1417	1274	
2001	Lowest possible F	0	2100	2026	2252	
2002	Establish recovery plan	-	3200	2715	2695	
2003	Closure of all fisheries for cod	-	1950	1477	1285	
2004	Zero catch	0	2150	1179	1072	
2005	Zero catch	0	2150	967	910	
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2007	Zero catch	0	1462	1117	702	148
2008	Zero catch	0	1199	1224	661	62
2009	Zero catch	0	899	754	468	60
2010	Zero catch	0	674	594	464	377
2011	Zero catch	0	506	485	368	43
2012	Zero catch	0	380	326	198	658

Year	ICES advice / single-stock exploitation boundaries since 2004	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings ^	ICES discards
2013	No directed fisheries, minimize bycatch and discards	0	285	281	205	118
2014	No directed fisheries, minimize bycatch and discards	0	228	236	213	149
2015	No directed fisheries, minimize bycatch and discards	0	182	199	18	224
2016	No directed fisheries, minimize bycatch and discards	0	146	122	82	60
2017	MSY approach	0	146	103 *	34	59
2018	MSY approach	≤ 1073	695	35 *	215	42
2019	MSY approach	≤ 807	807			
2020	Precautionary approach	≤116				

* Preliminary.

** Includes sample-based estimates of landings into three ports.

^ Excludes landings reported from rectangles 33E2 and 33E3 since 2004.

History of the catch and landings

Table 6 Cod in Division 7.a. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Estimated landings					
257 tonnes	Otter trawls		Scottish seines	Mid-water trawl	Beam trawls	Other gear types
	<i>Nephrops</i> directed 25%	Demersal fish directed 48%	< 1%	17%	9%	1%
	215 tonnes					
	Estimated discards					
	Otter trawls		Scottish seines	Mid-water trawl	Beam trawls	Other gear types
	<i>Nephrops</i> directed 70%	Demersal fish directed 18%	< 1%	< 1%	20%	2%

Table 7 Cod in Division 7.a. History of commercial catch and landings; official landings by country and ICES estimates of total landings and discards. All weights are in tonnes.

Year	Belgium	France	Ireland	Netherlands	Spain	UK (England Wales, & NI)	UK (Isle of Man)	UK (Scotland)	Total	Landings in rectangles 33E2 & 33E3 ***	Landings	Discards
1996	142	148	2476	25	-	2359	27	126	5303		4964 *	
1997	183	268	1492	29	-	2370	19	80	4441		5859 **	
1998	316	269	1739	20	-	2517	34	67	4962		5338 **	
1999	150	n/a	966	5	-	1665	9	80	2875		4781 **	
2000	60	53	455	1	-	799	11	38	1417		1274	
2001	283	74	751	-	-	885	1	32	2026		2252	
2002	318	116	1111	-	-	1134	7	29	2715		2695	
2003	183	151	594	-	14	505	7	23	1477		1285	
2004	104	29	380	-	-	646	5	15	1179	108	1072	
2005	115	35	220	-	-	594	n/a	3	967	54	910	
2006	60	18 **	275	-	-	5892	n/a	6	948	103	840	
2007	67	17 **	608	-	-	423	n/a	2	1117	527	702	148
2008	26	3	618 **	-	-	5432	22	12	1224	558	661	62
2009	19	12	323 **	-	-	3872	12	12	754	193	468	60
2010	21	1	289	-	-	282	1	-	594	143	464	377
2011	36	3	275	-	-	169	1	-	48	147	368	43
2012	23	1	193	-	-	109	< 1	-	32	85	198	658
2013	13	< 1	160	-	-	107	< 1	-	281	76	206	118
2014	9	< 1	148	-	-	79	< 1	-	236	24	213	149
2015	12	< 1	137	-	-	50	< 1	-	199	39	161	224
2016	3	< 1	84	-	-	35	< 1	-	122	40	82	60
2017 *	5	< 1	57	-	-	41	< 1	1	103	19	84	59
2018 *	2	< 1	105	-	-	128	1	< 1	235	20	215	42

* Preliminary.

** Includes sample-based estimates of landings into ports.

*** Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are not included in the assessment and are considered to be part of the cod stock in divisions 7.e–k.

Summary of the assessment

Table 8 Cod in Division 7.a. Assessment summary. Weights are in tonnes.

Year	Biomass index (relative)	Landings	Discards	Harvest rate (relative)
1968		8541	1285	
1969		7991	1898	
1970		6426	708	
1971		9246	363	
1972		9234	1546	
1973		11819	122	
1974		10251	1749	
1975		9863	257	
1976		10247	38	
1977		8054	201	
1978		5662	0	
1979		7548	0	
1980		10599	0	
1981		13958	0	
1982		13381	313	
1983		10015	372	
1984		8383	2	
1985		10483	61	
1986		9852	154	
1987		12894	128	
1988		14168	109	
1989		12751	202	
1990		7473	159	
1991		7095	163	
1992		75	98	
1993	1.26	755	155	2.9
1994	1.06	102	142	2.4
1995	0.79	437	166	2.8
1996	1.09	964	140	2.2
1997	1.26	5859	120	2.2
1998	1.48	5318	29	1.69
1999	1.40	4784	159	1.65
2000	0.80	1274	699	1.14
2001	1.16	2252	64	0.93
2002	2.2	2695	46	0.57
2003	2.2	1285	215	0.32
2004	0.5	1072	254	0.81
2005	0.73	910	204	0.71
2006	0.5	840	185	0.99
2007	0.42	702	145	0.94
2008	0.42	662	61	0.81
2009	0.5	466	88	0.72
2010	0.70	464	386	0.56
2011	0.95	365	48	0.20
2012	0.78	198	678	0.52
2013	0.82	206	152	0.20
2014	0.84	213	184	0.22
2015	1.63	161	147	0.088
2016	1.05	82	60	0.063
2017	0.97	84	59	0.069
2018	0.35	215	42	0.34

Sources and references

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