

**ECOREGION** Widely distributed and migratory stocks  
**STOCK** Roundnose grenadier (*Coryphaenoides rupestris*) in Subareas VI and VII, and Divisions Vb and XIIb

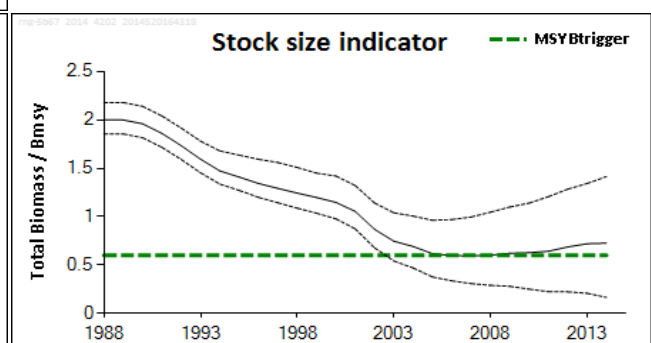
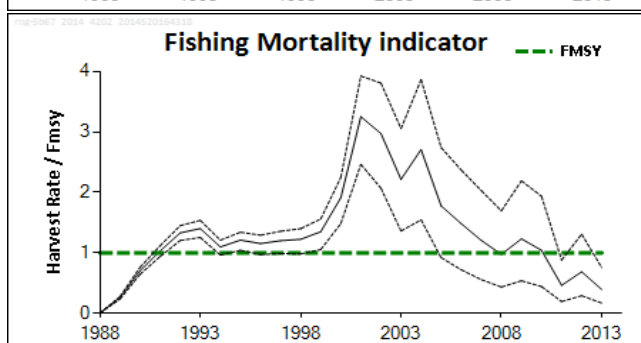
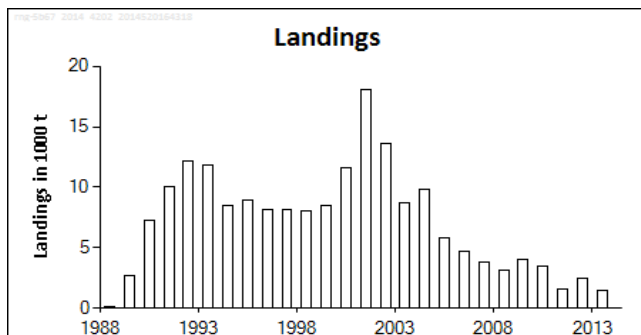
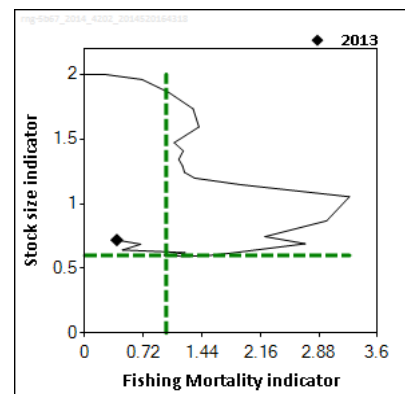
**Advice for 2015 and 2016**

ICES advises on the basis of the MSY approach that catches should be no more than 4595 t in 2015 and 4673 t in 2016 for Division Vb and Subareas VI and VII. If discard rates do not change from the average of the last three years (2011–2013), this implies landings of no more than 3952 t in 2015 and 4019 t in 2016.

Following the precautionary approach ICES advises annual catches of no more than 838 tonnes in 2015 and 2016 for Division XIIb. If discard rates do not change this implies annual landings of no more than landings in 2013 (796 t).

**Stock status**

Fishing pressure			
	2011	2012	2013
MSY ( $F_{MSY}$ )	✓	✓	✓ Below target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?
Stock size			
	2012	2013	2014
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?



**Figure 9.3.23.2.1** Roundnose grenadier in Subareas VI and VII, and Divisions Vb and XIIb. Summary of stock assessment (weights in thousand tonnes). Top right: Total biomass/ $B_{MSY}$  and Harvest rate/ $F_{MSY}$  over the years. Lower panels: dotted black lines are the 95% confidence intervals.

Total biomass for Division Vb and Subareas VI and VII is estimated to have been around  $B_{MSY}$  since 2002 but slightly increasing since 2006. The harvest rate has decreased since 2000 and has been below target  $F_{MSY}$  ( $H_{MSY}$ ) since 2010.

**Management plans**

No specific management objectives are known to ICES.

## Biology

See Section 9.3.23 for details on biology.

## The fisheries

Roundnose grenadier is caught in a mixed fishery catching also black scabbardfish and blue ling. Landings in recent years have been below TACs both in Division Vb, Subareas VI, VII, and Division XIIb. Discards accounted for about 30% of the catch in weight and 50% in number for the French fleets. Discards for the Spanish fleets are 10–18% of the landings in weight. In 2013, French discards have been reduced to 15% of the catch due to fishing activity in shallower waters and avoidance strategy. Spanish discard rates are estimated to be around 5% of the catch. Discard patterns from other countries are unknown.

**Catch distribution** Total catch (2013 provisional): 3.8 kt, where 3.2 kt were estimated landings (100% deep-water trawl) and 0.6 kt discards.

## Effects of the fisheries on the ecosystem

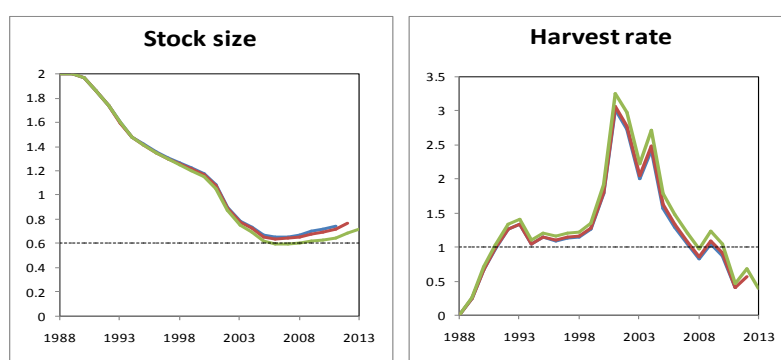
Deep-water bottom trawls impact the seabed, causing potential damage to deep-water coral communities. This is mitigated by closed areas to protect vulnerable marine ecosystems (VMEs). As this fishery is part of a mixed fisheries, effort on roundnose grenadier also impacts other commercial and non-commercial deep-water species.

## Quality considerations

The current assessment method does not use catches from Division XIIb. Exploratory assessments were carried out using these data but are not yet considered to be reliable for advice. Fishing activity in Division XIIb currently contributes to around 30% of the catch. The actual level of catch has been considered uncertain for several years because of problems with species reporting and misreporting to/from other areas. As this issue strongly impacts the quality of the assessment, it is necessary that substantial efforts are made to increase the monitoring of the fishery operating in Division XIIb. Spain is currently the only country reporting catches in Division XIIb.

The abundance index used in the assessment only goes back to 2000. There are no abundance indices for Hatton Bank (Division XIIb and Subdivision VIb<sub>1</sub>).

Discard data are available back to 1996. Discards have not been included in the assessment as it was considered that selection patterns in earlier years may have been different. Over the last three years, discard rates have declined for the French fishery in Division Vb and Subareas VI and VII.



**Figure 9.3.23.2.2** Roundnose grenadier in Subareas VI and VII, and Divisions Vb and XIIb. Historical assessment results. Stock size indicator = Biomass/B<sub>MSY</sub>, Fishing mortality indicator = Harvest rate/F<sub>MSY</sub>.

## Scientific basis

<b>Stock data category</b>	1 ( <a href="#">ICES, 2014a</a> ).
<b>Assessment type</b>	Bayesian surplus production model covering only Division Vb and Subareas VI and VII.
<b>Input data</b>	Landings (1988–current year), l <sub>pue</sub> (2000–current year).
<b>Discards and bycatch</b>	Used to provide advice, but not included in the assessment. Discard information available since 1996, average discard proportion 2011–2013 from the majority of the fleet / main fleets (covering 99% of the landings).
<b>Indicators</b>	Scottish deep-water survey in Division VIa.
<b>Other information</b>	This assessment unit was benchmarked in 2010 (WKDEEP; <a href="#">ICES, 2010</a> ).
<b>Working group</b>	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources ( <a href="#">WGDEEP</a> ).

**ECOREGION** Widely distributed and migratory stocks  
**STOCK** Roundnose grenadier (*Coryphaenoides rupestris*) in Subareas VI and VII, and Divisions Vb and XIIb

**Reference points**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY approach	MSY B <sub>trigger</sub> *	41 437 t	B <sub>loss</sub> (in 2006 in the 2014 assessment).
	B <sub>MSY</sub> *	68 975 t	Half of carrying capacity <i>K</i> , estimated from the surplus production model (2014).
	F <sub>MSY</sub> *	0.08	Harvest rate at MSY. Half of the intrinsic growth rate <i>r</i> , estimated from the surplus production model (2014).
Precautionary approach	B <sub>lim</sub>	Not defined.	
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

(Last changed in: 2014)

\* Estimates of MSY B<sub>trigger</sub>, B<sub>MSY</sub>, and F<sub>MSY</sub> apply to Division Vb and Subareas VI and VII only.

**Outlook for 2015 and 2016****For Division Vb and Subareas VI and VII only**

Basis:  $F(2014) / F_{MSY} = \text{TAC constraint} = 0.062$ ;  $B(2015)/B_{MSY} = 0.741$ ; Recruitment (2015) = modelled intrinsic growth rate, no values; Catches (2014) = 5011; Landings (2014) = TAC (2014)<sub>VB,VI,VII</sub> = 4297; Discards (2014) = 714 (14% in weight, average of 2011–2013).

Rationale	Landings (2015)	Total biomass (at the end of the year)		Harvest rate		% biomass change <sup>1)</sup>	% TAC change <sup>2)</sup>
		(2015)	(2016)	(2015)	(2016)		
MSY approach	3952 (2015) 4019 (2016)	51 114	52 037	0.08	0.08	+2%	-7%
Precautionary approach	4297	50 827	51 420	0.08	0.08	+1%	0%
Zero catch	0	55 124	60 165	0	0	+10%	-100%
Other options	1000	54 124	58 133	0.02	0.02	+8%	-330%
	2000	53 124	56 100	0.04	0.04	+6%	-115%
	3000	52 124	54 064	0.06	0.06	+4%	-43%
	4000	51 124	52 025	0.08	0.08	+2%	-7%
	5000	50 124	49 985	0.10	0.10	0%	+14%
	6000	49 124	47 942	0.12	0.13	-2%	+28%
	7000	48 124	45 897	0.15	0.15	-4%	+39%
8000	47 124	43 850	0.17	0.18	-6%	+46%	

Weights in tonnes.

<sup>1)</sup> Biomass at the end of 2015 relative to Biomass at the end of 2014.

<sup>2)</sup> Catch 2015 relative to TAC 2014.

**MSY approach**

Following the ICES MSY approach implies fishing at a F<sub>MSY</sub> harvest rate of 0.08 for Division Vb and Subareas VI and VII, which implies landings of no more than 3952 t in 2015 and 4019 t in 2016 for Division Vb and Subareas VI and VII. If discard rates do not change from the average of the last three years (2011–2013), this implies catches of no more than 4595 t in 2015 and 4673 t in 2016.

Landings in Division XIIb have been declining in recent years. Following the precautionary approach ICES advises that landings should be no higher than those in 2013 (796 t). If discard rates (5%) do not change this implies catches of no more than 838 tonnes in 2015 and 2016 for Division XIIb.

### Additional considerations

The survey index from Scotland is not used in the assessment but is informative of stock abundance and biomass in Division VIa and shows an increase in recent years.

Ifremer has established a partnership with two French fishing organizations, PMA and Euronor, to update Ipue series from tally-book data containing details of 31 000 hauls since 2000. These data are currently used in the assessment of this stock.

#### Comparison of the basis of previous assessment and advice

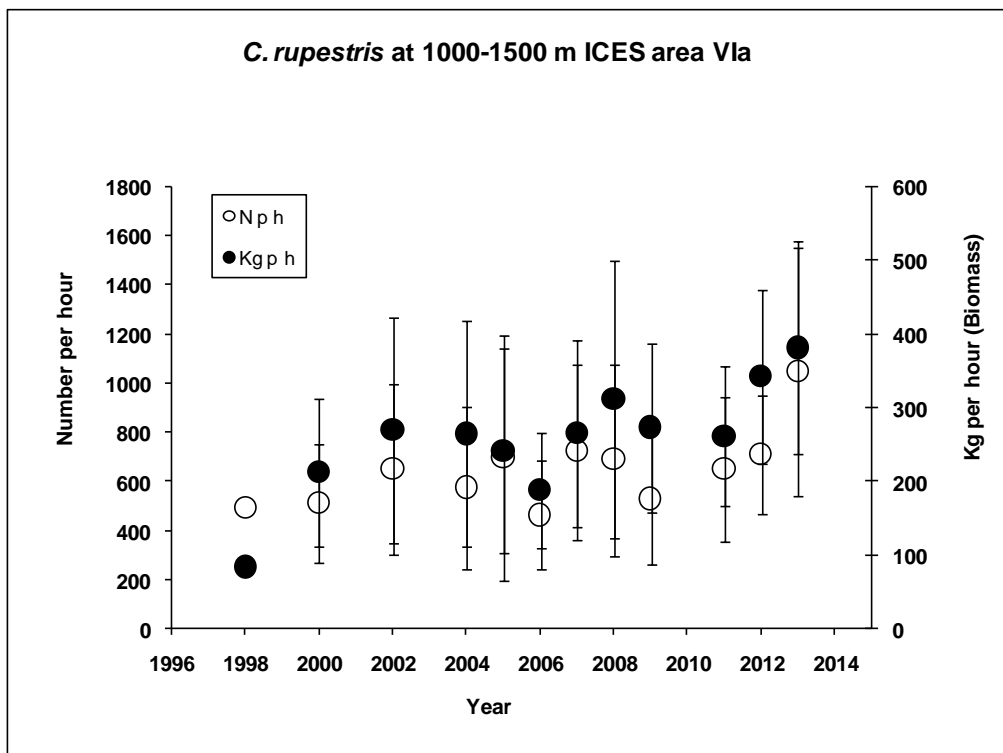
The basis for the assessment has not changed from 2012.

The basis for the advice this year is the same as last year: MSY approach in Division Vb and Subareas VI and VII, and the precautionary approach in Division XIIIb.

The multi-year catch curve (MYCC) assessment was included in the benchmark method for this stock in 2010. The model was used in 2011, but not in subsequent years due to lack of age data.

### Sources

- ICES. 2010. Report of the Benchmark Workshop on Deep-water Species (WKDEEP), 17–24 February 2010, Copenhagen, Denmark. ICES CM 2010/ACOM:38. 247 pp.
- ICES. 2012. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP), 29 March–05 April 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:17.
- ICES. 2014a. Advice basis. *In* Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.2.
- ICES. 2014b. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP), 4–11 April 2014, ICES Headquarters, Copenhagen. ICES CM 2014/ACOM:17.



**Figure 9.3.23.2.3** Roundnose grenadier in Division VIa. Abundance indices of roundnose grenadier according to Marine Scotland deep-water survey in Division VIa.

**Table 9.3.23.2.1** Roundnose grenadier in Subareas VI and VII, and Divisions Vb and XIIb. ICES advice, management, and landings.

Year	ICES Advice	Predicted catch corresp. to advice	TAC EU Division Vb and Subareas VI and VII	TAC EU Subareas VII, IX, X, XII, and XIV	ICES landings Subareas VI and VII, and Divisions Vb and XIIb
2003	Significant reduction in effort	-	5.106		21.0
2004	Biennial	-	5.106		22.7
2005	50% reduction in effort in relation to 2000–2002 levels	-	5.253	7.190	14.6
2006	Biennial	-	5.253	7.190	9.0
2007	Constrain catches to 50% level before the expansion period, 1990–1996	< 6	4.6	6.114	8.0
2008	Biennial	< 6	4.6	6.114	5.5
2009	Constrain catches to 50% level before the expansion period, 1990–1996	< 6	3.91	5.197	8.9
2010	Biennial	< 6	3.324	5.197	6.2
2011	Less than 6000 t and a further reduction in catches from recent levels should be considered	< 6	2.924	4.573	3.2
2012	No new advice, same as 2011	< 6	2.546	3.979	8.0
2013	Based on MSY approach catches should be < 6000 t	< 6	4.297	3.581	3.0
2014	No new advice, same as 2013	< 6	4.297	3.223	
2015	MSY approach	< 5.433			
2016	No new advice, same as 2015	< 5.511			

Weights in thousand tonnes.

**Table 9.3.23.2.2** Roundnose grenadier in Subareas VI and VII, and in Division Vb. ICES estimates of landings (tonnes) by country and subarea.

Year	Vb								VI											VII							
	Faroes	France	Norway	Germany	Russia/USSR	UK (E+W)	UK (Scot)	TOTAL	Estonia	Faroes	France	Germany	Ireland	Lithuania	Norway	Poland	Russia	Spain	UK (E+W)	UK (Scot)	TOTAL	Faroes	France	Ireland	Spain	UK (Scot)	TOTAL
1988				1				<b>1</b>		27		4							1		<b>32</b>						<b>0</b>
1989	20	181		5	52			<b>258</b>		2	2211	3								2	<b>2218</b>		222				<b>222</b>
1990	75	1470		4				<b>1549</b>		29	5484	2									<b>5515</b>		215				<b>215</b>
1991	22	2281	7	1				<b>2311</b>			7297	7									<b>7304</b>		489				<b>489</b>
1992	551	3259	1	6				<b>3817</b>		99	6422	142			5				2	112	<b>6782</b>		1556				<b>1556</b>
1993	339	1328		14				<b>1681</b>		263	7940	1								1	<b>8205</b>		1916				<b>1916</b>
1994	286	381		1				<b>668</b>			5898	15	14							11	<b>5938</b>		1922				<b>1922</b>
1995	405	818						<b>1223</b>			6329	2	59							82	<b>6472</b>		1295				<b>1295</b>
1996	93	983		2				<b>1078</b>			5888									156	<b>6044</b>		1051				<b>1051</b>
1997	53	1059						<b>1112</b>		15	5795		4							218	<b>6032</b>		1033		5		<b>1038</b>
1998	50	1617						<b>1667</b>		13	5170				21			3			<b>5207</b>		1146		11		<b>1157</b>
1999	104	1861	2			29		<b>1996</b>			5637	3	1				1				<b>5642</b>		892		4		<b>896</b>
2000	48	1699		1		43		<b>1791</b>			7478		41	1			1002	1	433		<b>8956</b>		859				<b>859</b>
2001	84	1932						<b>2016</b>	680	11	5897	6	31	137	32	58	3	6942	21	955	<b>14773</b>		938	416			<b>1354</b>
2002	176	774				81		<b>1031</b>	821		7209		12	1817		932			6	741	<b>11538</b>	1	449	605		3	<b>1058</b>
2003	490	1032				10		<b>1532</b>	52	32	4924		11	939		452	3			185	<b>6598</b>		373	213		1	<b>587</b>
2004	508	985	0	0	6	0	76	<b>1575</b>	26	12	4574	0	8	961	0	13	72	1991	0	72	<b>7729</b>	0	248	320	0	0	<b>568</b>
2005	903	884	1	0	1	0	48	<b>1837</b>	80	24	2897	0	17	92	1	0	71	467	0	44	<b>3694</b>	0	191	55	0	0	<b>246</b>
2006	900	875	0	0	0	0	0	<b>1775</b>	34	25	1931	0	5	112	0	0	0	393	0	15	<b>2515</b>		248	138	0	0	<b>386</b>
2007	838	862	0	0	0	0	0	<b>1700</b>	0	10	1552	0	2	31	0	0	0	252	0	4	<b>1851</b>		207	20	0	0	<b>227</b>
2008	665	447	0	0	0	0	0	<b>1112</b>	0	6	1433	0	0	23	0	0	16	458	0	27	<b>1963</b>		27				<b>27</b>
2009	322	122	0	0	0	0	2	<b>446</b>	0	6	1090	0	0	0	0	0	0	1900	0	15	<b>3012</b>		59				<b>59</b>
2010	229	381	0	0	0	0	1	<b>611</b>	0	13	1271	0	0	0	2	0	0	1498	1	23	<b>2809</b>		41				<b>41</b>
2011	63	11	0	0	0	0	0	<b>74</b>	0	4	1112	0	0	0	0	0	0	345	0	8	<b>1469</b>		34				<b>34</b>
2012	16	28	0	0	0	0	0	<b>44</b>	0	0	1088	0	0	0	0	0	0	258	2	0	<b>2409</b>		48				<b>48</b>
2013*	17	28	0	0	0	0	0	<b>45</b>	0	0	925	0	0	0	0	0	0	482	6	0	<b>1414</b>		39				<b>39</b>

\*Preliminary.

**Table 9.3.23.2.3** Roundnose grenadier in Division XIIb. ICES estimates of landings (tonnes) by country and subarea.

Year	XIIb												
	Estonia	Faroes	France**	Germany	Iceland	Ireland	Lithuania	Spain	USSR/Russia	UK (E+W)	UK (Scotl.)	Norway	TOTAL
1988													<b>0</b>
1989			0						52				<b>52</b>
1990			0										<b>0</b>
1991			14						158				<b>172</b>
1992			13										<b>13</b>
1993		263	26	39									<b>328</b>
1994		457	20	9									<b>486</b>
1995		359	285										<b>644</b>
1996		136	179		77			1136					<b>1528</b>
1997		138	111					1800					<b>2049</b>
1998		19	116					4262					<b>4397</b>
1999		29	287					8251	6				<b>8573</b>
2000		6	374	9				5791		9	6		<b>6195</b>
2001		2	159			3		5922			7	1	<b>6094</b>
2002			14				18	10045		1	2		<b>10080</b>
2003			539			1	31	11663			1		<b>12235</b>
2004		8	1693				120	10880	91		4		<b>12796</b>
2005	20	5	508				13	7804	81		350		<b>8782</b>
2006	27	1	85				6	4242					<b>4361</b>
2007	140	2	0				8	4108					<b>4258</b>
2008		0	0				3	2416	13				<b>2432</b>
2009								5335					<b>5335</b>
2010			1					2758					<b>2759</b>
2011		3						1575					<b>1578</b>
2012		9						657					<b>666</b>
2013*								796					<b>796</b>

\*Preliminary.

\*\* French landings reported in former ICES Subarea XII allocated to Division XIIb.

**Table 9.3.23.2.4** Roundnose grenadier in Subareas VI and VII, and Divisions Vb and XIIb. Summary of the assessment.

Year	Stock size indicator	High	Low	Landings	Fishing mortality indicator	High	Low
	Total biomass / B <sub>MSY</sub>			tonnes	Harvest rate / F <sub>MSY</sub>		
1988	1.86	2.00	2.18	30	0.003	0.003	0.003
1989	1.86	2.00	2.18	2700	0.256	0.276	0.235
1990	1.82	1.96	2.14	7280	0.705	0.761	0.646
1991	1.72	1.86	2.04	10100	1.031	1.118	0.94
1992	1.59	1.73	1.92	12160	1.33	1.45	1.205
1993	1.45	1.59	1.78	11800	1.402	1.537	1.254
1994	1.34	1.47	1.68	8530	1.098	1.21	0.963
1995	1.27	1.41	1.64	8990	1.21	1.341	1.042
1996	1.20	1.34	1.59	8170	1.154	1.292	0.973
1997	1.14	1.29	1.56	8180	1.201	1.358	0.988
1998	1.09	1.24	1.51	8030	1.224	1.4	0.983
1999	1.04	1.20	1.45	8530	1.348	1.56	1.054
2000	0.98	1.15	1.42	11610	1.913	2.247	1.484
2001	0.87	1.05	1.32	18140	3.254	3.927	2.466
2002	0.68	0.87	1.14	13630	2.973	3.81	2.07
2003	0.54	0.75	1.04	8720	2.216	3.056	1.361
2004	0.47	0.69	1.01	9870	2.71	3.867	1.547
2005	0.38	0.62	0.96	5780	1.777	2.742	0.921
2006	0.34	0.60	0.97	4680	1.484	2.37	0.72
2007	0.31	0.59	1.00	3780	1.205	2.03	0.556
2008	0.29	0.60	1.05	3100	0.975	1.695	0.434
2009	0.28	0.62	1.10	4050	1.232	2.192	0.538
2010	0.25	0.63	1.14	3460	1.041	1.936	0.442
2011	0.22	0.64	1.21	1580	0.462	0.88	0.193
2012	0.22	0.69	1.28	2500	0.687	1.309	0.291
2013	0.21	0.72	1.34	1500	0.392	0.755	0.168
2014	0.16	0.73	1.41				
<b>Average</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>7188</b>	<b>1.319</b>	<b>1.774</b>	<b>0.903</b>