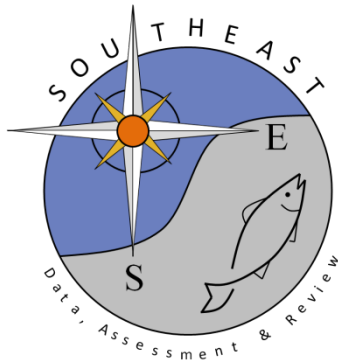


Continuity Runs for Atlantic Sharpnose and Bonnethead SEAMAP Groundfish  
Surveys and NMFS Bottom Longline Surveys

Adam G. Pollack and G. Walter Ingram, Jr.

SEDAR34-WP-16

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## Continuity Runs for Atlantic Sharpnose and Bonnethead SEAMAP Groundfish Surveys and NMFS Bottom Longline Surveys

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Prior to the Data Workshop for SEDAR 34, we were asked to rerun abundance indices for use in continuity runs of the stock assessment models for Atlantic sharpnose, *Rhizoprionodon terraenovae*, and bonnethead, *Sphyrna tiburo*. Six indices were requested from the SEAMAP Groundfish survey and three were requested from the NMFS Bottom Longline survey. The indices requested were:

Species	Survey	Years	Table
Atlantic sharpnose	Summer SEAMAP Groundfish	1982-2011	1
Atlantic sharpnose	Fall SEAMAP Groundfish	1972-2011	2
Bonnethead	Summer SEAMAP Groundfish	1982-2011	3
Bonnethead	Fall SEAMAP Groundfish	1972-2011	4
Bonnethead	Early Fall SEAMAP Groundfish	1972-1986	5
Bonnethead	Late Fall SEAMAP Groundfish	1987-2011	6
Atlantic sharpnose	NMFS Bottom Longline – GOM	1995-2011	7
Atlantic sharpnose	NMFS Bottom Longline – Atlantic	1995-2011	8
Atlantic sharpnose	NMFS Bottom Longline – GOM & Atlantic	1995-2011	9

All abundance indices were constructed using the delta-lognormal method outlined by Lo *et al.* 1992. For the SEAMAP Groundfish indices, in the previous working documents a Bayesian approach was used, which was not able to be replicated and was thus replaced with the delta-lognormal approach. In addition, it is not known which version of the data was used; however, the most current set was used for these runs. The same concern and solution about the version of the data also applies to the NMFS Bottom Longline data. For a full review of the data, model variables and model selection refer to the current working document for SEAMAP Groundfish (SEDAR34-DW-##) and NMFS Bottom Longline (SEDAR34-DW-##).

### Literature Cited

Lo, N.C.H., L.D. Jacobson, and J.L. Squire. 1992. Indices of relative abundance from fish spotter data based on delta-lognormal models. *Canadian Journal of Fisheries and Aquatic Science* 49:2515-2526.

Table 1. Abundance indices for Atlantic sharpnose from the Summer SEAMAP Groundfish survey 1982-2011.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1982	0.01064	188	0.01858	0.09735	0.75071	0.02556	0.37070
1983	0.04688	192	0.45210	2.36821	0.36675	1.16375	4.81926
1984	0.00467	214	0.02986	0.15643	1.02950	0.02857	0.85642
1985	0.02326	172	0.10014	0.52456	0.54307	0.18977	1.45000
1986	0.01205	166	0.06305	0.33025	0.75295	0.08645	1.26165
1987	0.04530	287	0.29346	1.53719	0.31129	0.83671	2.82412
1988	0.05983	234	0.27386	1.43451	0.30112	0.79581	2.58580
1989	0.05140	214	0.19881	1.04140	0.33766	0.53978	2.00921
1990	0.03065	261	0.06700	0.35095	0.39229	0.16467	0.74794
1991	0.05512	254	0.21797	1.14176	0.30351	0.63057	2.06736
1992	0.07258	248	0.19857	1.04014	0.26770	0.61458	1.76036
1993	0.04858	247	0.24233	1.26938	0.32378	0.67506	2.38695
1994	0.02672	262	0.09803	0.51349	0.41790	0.23017	1.14556
1995	0.09664	238	0.43104	2.25787	0.23834	1.41102	3.61298
1996	0.09016	244	0.36553	1.91470	0.24348	1.18482	3.09421
1997	0.06061	231	0.18834	0.98657	0.30192	0.54649	1.78106
1998	0.07456	228	0.14367	0.75257	0.27608	0.43766	1.29407
1999	0.06098	246	0.20108	1.05332	0.29146	0.59504	1.86456
2000	0.10042	239	0.21665	1.13483	0.23375	0.71548	1.79998
2001	0.02841	176	0.09657	0.50586	0.49027	0.19994	1.27985
2002	0.09163	251	0.25289	1.32471	0.23838	0.82779	2.11994
2003	0.05366	205	0.15226	0.79755	0.33804	0.41309	1.53981
2004	0.03750	240	0.09802	0.51347	0.37193	0.24996	1.05477
2005	0.04663	193	0.12449	0.65209	0.37204	0.31738	1.33980
2006	0.06276	239	0.21169	1.10885	0.29200	0.62577	1.96486
2007	0.06364	220	0.16996	0.89030	0.30094	0.49407	1.60431
2008	0.07213	305	0.29475	1.54398	0.24267	0.95690	2.49124
2009	0.04869	534	0.24473	1.28194	0.22202	0.82668	1.98792
2010	0.04485	379	0.17204	0.90119	0.26974	0.53042	1.53114
2011	0.03939	330	0.10969	0.57457	0.30839	0.31444	1.04989

Table 2. Abundance indices for Atlantic sharpnose from the Fall SEAMAP Groundfish survey 1972-2011.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1972	0.05978	184	0.20274	0.71574	0.48242	0.28671	1.78676
1973	0.09191	272	0.23160	0.81761	0.28913	0.46391	1.44097
1974	0.22634	243	1.01861	3.59602	0.23832	2.24737	5.75398
1975	0.18571	280	0.72553	2.56135	0.25204	1.55924	4.20751
1976	0.20521	307	0.67651	2.38827	0.21548	1.55970	3.65701
1977	0.15289	242	0.30188	1.06573	0.26002	0.63897	1.77752
1978	0.12539	319	0.37264	1.31554	0.28984	0.74544	2.32164
1979	0.13553	273	0.38274	1.35119	0.27390	0.78904	2.31384
1980	0.18455	233	0.68636	2.42305	0.26210	1.44701	4.05744
1981	0.17204	279	0.56548	1.99633	0.25864	1.20007	3.32090
1982	0.16484	273	0.47885	1.69048	0.27107	0.99248	2.87938
1983	0.10811	222	0.33018	1.16564	0.30321	0.64413	2.10938
1984	0.12389	226	0.27278	0.96300	0.33150	0.50485	1.83692
1985	0.06452	341	0.28423	1.00341	0.33093	0.52659	1.91199
1986	0.06291	302	0.30367	1.07204	0.31632	0.57807	1.98809
1987	0.09615	208	0.55895	1.97326	0.42295	0.87664	4.44170
1988	0.09746	236	0.17377	0.61347	0.32387	0.32619	1.15377
1989	0.06478	247	0.16759	0.59165	0.41924	0.26458	1.32305
1990	0.08000	250	0.18075	0.63809	0.34081	0.32881	1.23827
1991	0.08097	247	0.12165	0.42945	0.35568	0.21534	0.85644
1992	0.07826	230	0.07208	0.25446	0.28371	0.14586	0.44390
1993	0.07692	273	0.16411	0.57937	0.33806	0.30008	1.11862
1994	0.08696	253	0.23300	0.82256	0.34447	0.42103	1.60701
1995	0.07884	241	0.12828	0.45285	0.32774	0.23906	0.85783
1996	0.09163	251	0.31534	1.11324	0.32706	0.58842	2.10613
1997	0.08097	247	0.15418	0.54431	0.38433	0.25909	1.14353
1998	0.05495	273	0.13918	0.49134	0.45235	0.20731	1.16454
1999	0.06452	248	0.27306	0.96400	0.43456	0.41959	2.21478
2000	0.09426	244	0.20881	0.73716	0.31873	0.39572	1.37322
2001	0.07048	227	0.09185	0.32426	0.36365	0.16024	0.65615
2002	0.05447	257	0.10891	0.38449	0.35084	0.19451	0.76003

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<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
2003	0.09091	275	0.14930	0.52708	0.30549	0.29002	0.95792
2004	0.06114	229	0.13878	0.48993	0.40203	0.22591	1.06253
2005	0.06693	254	0.18661	0.65877	0.41794	0.29527	1.46976
2006	0.06696	224	0.14883	0.52542	0.38907	0.24797	1.11329
2007	0.07895	228	0.13977	0.49342	0.36342	0.24394	0.99803
2008	0.06831	366	0.16033	0.56602	0.28204	0.32548	0.98432
2009	0.07883	444	0.21874	0.77220	0.30459	0.42561	1.40105
2010	0.05714	315	0.13184	0.46542	0.30630	0.25571	0.84713
2011	0.06849	219	0.13097	0.46237	0.35042	0.23410	0.91326

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Table 3. Abundance indices for bonnethead from the Summer SEAMAP Groundfish survey 1982-2011.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1982	0	188					
1983	0.005208	192	0.014950	0.81755	0.85708	0.18531	3.60684
1984	0	214					
1985	0.005814	172	0.023383	1.27870	0.85860	0.28925	5.65278
1986	0	166					
1987	0.003484	287	0.012535	0.68545	0.86000	0.15477	3.03585
1988	0	234					
1989	0	214					
1990	0.003831	261	0.004462	0.24403	0.86014	0.05509	1.08100
1991	0	254					
1992	0.004032	248	0.004834	0.26437	0.85943	0.05974	1.16998
1993	0.008097	247	0.011902	0.65088			
1994	0	262					
1995	0.012605	238	0.025976	1.42047	0.51486	0.53857	3.74646
1996	0.012295	244	0.013167	0.72002	0.51456	0.27313	1.89807
1997	0.008658	231	0.018893	1.03316	0.62096	0.32971	3.23744
1998	0	228					
1999	0.012195	246	0.021862	1.19550	0.51445	0.45359	3.15091
2000	0	239					
2001	0.005682	176					
2002	0	251					
2003	0.004878	205					
2004	0.008333	240	0.018563	1.01513	0.62152	0.32368	3.18369
2005	0.010363	193	0.008680	0.47467	0.62314	0.15097	1.49248
2006	0.016736	239	0.024031	1.31413	0.45098	0.55579	3.10719
2007	0.022727	220	0.019021	1.04014	0.40772	0.47476	2.27882
2008	0.016393	305	0.040036	2.18934	0.40660	1.00129	4.78703
2009	0.007491	534	0.016553	0.90521	0.45119	0.38270	2.14111
2010	0.013193	379	0.031587	1.72735	0.40460	0.79283	3.76341
2011	0.012121	330	0.018724	1.02389	0.44956	0.43411	2.41499

Table 4. Abundance indices for bonnethead from the Fall SEAMAP Groundfish survey 1972-2011.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1972	0.06522	184	0.20677	2.14642	0.39578	1.00086	4.6031
1973	0.09191	272	0.56700	5.88583	0.28902	3.34028	10.3713
1974	0.06996	243	0.42633	4.42556	0.34423	2.26623	8.6423
1975	0.04286	280	0.11745	1.21922	0.40455	0.55966	2.6561
1976	0.07166	307	0.35887	3.72532	0.31405	2.01730	6.8795
1977	0.04545	242	0.21262	2.20714	0.41479	0.99483	4.8968
1978	0.03448	319	0.11821	1.22707	0.41564	0.55224	2.7265
1979	0.02564	273	0.17781	1.84577	0.50558	0.71084	4.7927
1980	0.02146	233	0.09410	0.97677	0.58524	0.32991	2.8919
1981	0.02509	279	0.08084	0.83921	0.50638	0.32276	2.1820
1982	0.02198	273	0.06170	0.64044	0.54016	0.23281	1.7618
1983	0.01802	222	0.06599	0.68498	0.64936	0.20916	2.2433
1984	0.00000	226					
1985	0.00587	341	0.01117	0.11598	0.89481	0.02502	0.5377
1986	0.02980	302	0.09418	0.97765	0.45022	0.41402	2.3086
1987	0.02404	208	0.02187	0.22698	0.58908	0.07619	0.6762
1988	0.02542	236	0.03992	0.41436	0.54469	0.14950	1.1484
1989	0.01215	247	0.01283	0.13321	0.74368	0.03534	0.5022
1990	0.02400	250	0.03412	0.35415	0.54415	0.12789	0.9807
1991	0.03239	247	0.02359	0.24490	0.48104	0.09834	0.6099
1992	0.02609	230	0.02360	0.24496	0.54491	0.08835	0.6792
1993	0.02930	273	0.03113	0.32315	0.47966	0.13006	0.8029
1994	0.01976	253	0.02864	0.29729	0.59007	0.09964	0.8870
1995	0.01660	241	0.02065	0.21439	0.65275	0.06512	0.7058
1996	0.04382	251	0.04754	0.49350	0.42052	0.22019	1.1061
1997	0.03239	247	0.03171	0.32915	0.48103	0.13216	0.8197
1998	0.02564	273	0.01870	0.19416	0.50848	0.07441	0.5066
1999	0.03226	248	0.02803	0.29094	0.48061	0.11691	0.7240
2000	0.03689	244	0.02512	0.26073	0.45702	0.10912	0.6230
2001	0.03524	227	0.03063	0.31797	0.48184	0.12750	0.7930
2002	0.03502	257	0.05636	0.58507	0.45691	0.24491	1.3977



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<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
2003	0.03273	275	0.05821	0.60430	0.45606	0.25333	1.4415
2004	0.03057	229	0.06763	0.70208	0.50975	0.26849	1.8359
2005	0.07087	254	0.05384	0.55884	0.34622	0.28512	1.0953
2006	0.04911	224	0.04223	0.43837	0.42124	0.19534	0.9838
2007	0.10088	228	0.10683	1.10896	0.31600	0.59834	2.0553
2008	0.06557	366	0.10954	1.13711	0.30163	0.63022	2.0517
2009	0.04730	444	0.10319	1.07119	0.30912	0.58543	1.9600
2010	0.03810	315	0.06680	0.69345	0.38886	0.32739	1.4688
2011	0.05479	219	0.08125	0.84340	0.39761	0.39198	1.8147

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Table 5. Abundance indices for bonnethead from the Early Fall SEAMAP Groundfish survey 1972-1986.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1972	0.065217	184	0.17084	1.29539	0.30889	0.70825	2.36925
1973	0.091912	272	0.36536	2.77031	0.22092	1.79029	4.28681
1974	0.069959	243	0.24038	1.82267	0.26398	1.08460	3.06300
1975	0.042857	280	0.11626	0.88154	0.31645	0.47523	1.63521
1976	0.071661	307	0.24908	1.88861	0.23613	1.18528	3.00927
1977	0.045455	242	0.13869	1.05160	0.32817	0.55471	1.99360
1978	0.034483	319	0.09567	0.72539	0.32707	0.38342	1.37238
1979	0.025641	273	0.10517	0.79747	0.40949	0.36285	1.75266
1980	0.021459	233	0.05888	0.44647	0.47797	0.18022	1.10607
1981	0.025090	279	0.06655	0.50462	0.40775	0.23032	1.10561
1982	0.021978	273	0.03935	0.29838	0.43874	0.12892	0.69056
1983	0.018018	222	0.04315	0.32718	0.53493	0.11997	0.89230
1984	0.000000	226					
1985	0.005865	341	0.01541	0.11683	0.74981	0.03072	0.44434
1986	0.029801	302	0.14159	1.07355	0.36226	0.53189	2.16684

Table 6. Abundance indices for bonnethead from the Late Fall SEAMAP Groundfish survey 1987-2011.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1987	0.02404	208	0.02164	0.38574	0.52982	0.14264	1.04311
1988	0.02542	236	0.04696	0.83695	0.48772	0.33225	2.10834
1989	0.01215	247	0.01370	0.24418	0.67027	0.07221	0.82566
1990	0.02400	250	0.04104	0.73135	0.48701	0.29068	1.84008
1991	0.03239	247	0.02621	0.46719	0.42908	0.20532	1.06306
1992	0.02609	230	0.02737	0.48787	0.48794	0.19360	1.22943
1993	0.02930	273	0.03598	0.64131	0.42752	0.28261	1.45525
1994	0.01976	253	0.03202	0.57062	0.52918	0.21124	1.54145
1995	0.01660	241	0.02630	0.46869	0.58670	0.15793	1.39093
1996	0.04382	251	0.05569	0.99245	0.37345	0.48179	2.04433
1997	0.03239	247	0.03509	0.62534	0.42910	0.27481	1.42297
1998	0.02564	273	0.02145	0.38230	0.45503	0.16055	0.91033
1999	0.03226	248	0.03217	0.57335	0.42883	0.25208	1.30404
2000	0.03689	244	0.03000	0.53469	0.40705	0.24435	1.17003
2001	0.03524	227	0.03800	0.67720	0.43056	0.29684	1.54495
2002	0.03502	257	0.06386	1.13812	0.40652	0.52060	2.48812
2003	0.03273	275	0.06792	1.21041	0.40533	0.55484	2.64054
2004	0.03057	229	0.07861	1.40093	0.45505	0.58831	3.33599
2005	0.07087	254	0.06303	1.12326	0.30494	0.61869	2.03931
2006	0.04911	224	0.05434	0.96838	0.37324	0.47029	1.99401
2007	0.10088	228	0.12292	2.19064	0.27740	1.27079	3.77632
2008	0.06557	366	0.13678	2.43772	0.26292	1.45352	4.08835
2009	0.04730	444	0.13780	2.45592	0.26998	1.44487	4.17445
2010	0.03810	315	0.08747	1.55893	0.34325	0.79974	3.03883
2011	0.05479	219	0.10641	1.89647	0.35167	0.95796	3.75445

Table 7. Abundance indices for Atlantic sharpnose from the NMFS Bottom Longline survey from 1995-2011 in the Gulf of Mexico.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1995	0.39189	74	1.04166	0.28598	0.36660	0.14057	0.58181
1996	0.34177	79	1.74243	0.47838	0.37164	0.23300	0.98218
1997	0.39024	164	0.90881	0.24951	0.29536	0.13992	0.44493
1998		0					
1999	0.43478	161	0.92844	0.25490	0.25930	0.15304	0.42456
2000	0.45255	137	2.42993	0.66713	0.25822	0.40136	1.10888
2001	0.37545	277	2.82968	0.77688	0.18795	0.53520	1.12769
2002	0.52830	212	3.52015	0.96645	0.17385	0.68438	1.36477
2003	0.46786	280	4.16394	1.14320	0.14672	0.85380	1.53068
2004	0.43103	232	6.15595	1.69010	0.15572	1.24011	2.30336
2005	0.34615	52	4.69679	1.28949	0.29116	0.72886	2.28134
2006	0.47333	150	6.22516	1.70910	0.18384	1.18689	2.46106
2007	0.33974	156	2.67657	0.73484	0.23396	0.46311	1.16603
2008	0.35185	108	2.71838	0.74632	0.23848	0.46628	1.19457
2009	0.57838	185	8.88912	2.44048	0.13597	1.86171	3.19916
2010	0.48344	151	6.11097	1.67775	0.16544	1.20781	2.33053
2011	0.32839	472	3.23994	0.88951	0.12666	0.69116	1.14479

Table 8. Abundance indices for Atlantic sharpnose from the NMFS Bottom Longline survey from 1995-2011 in the Atlantic Ocean.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1995	0.58140	43	1.5475	0.12936	0.52991	0.04783	0.34988
1996	0.40000	30	0.9112	0.07617	0.59218	0.02544	0.22803
1997	0.70313	64	2.1618	0.18072	0.52256	0.06764	0.48282
1998		0					
1999		0					
2000	0.81034	58	3.1070	0.25973	0.42202	0.11558	0.58367
2001		0					
2002	0.68927	177	11.3208	0.94636	0.18699	0.65318	1.37113
2003		0					
2004	0.95000	40	13.1854	1.10223	0.33638	0.57265	2.12157
2005	0.85185	27	26.1745	2.18805	0.29390	1.23040	3.89107
2006	0.75862	58	21.9317	1.83337	0.20539	1.22093	2.75302
2007		0					
2008	0.86486	37	12.9268	1.08062	0.18054	0.75529	1.54607
2009	0.65625	32	20.2560	1.69330	0.28162	0.97447	2.94236
2010	0.57692	26	13.9927	1.16971	0.34724	0.59568	2.29690
2011	0.80000	50	16.0344	1.34039	0.18691	0.92528	1.94172

Table 9. Abundance indices for Atlantic sharpnose from the NMFS Bottom Longline survey from 1995-2011 in the Gulf of Mexico and Atlantic Ocean.

<i>SurveyYear</i>	<i>NominalFrequency</i>	<i>N</i>	<i>LoIndex</i>	<i>ScaledLoIndex</i>	<i>CV</i>	<i>LCL</i>	<i>UCL</i>
1995	0.46154	117	1.0270	0.20584	0.33013	0.10818	0.39163
1996	0.35780	109	1.3726	0.27508	0.37241	0.13379	0.56558
1997	0.47807	228	1.2309	0.24668	0.27443	0.14391	0.42286
1998		0					
1999	0.43478	161	1.0713	0.21470	0.29211	0.12114	0.38053
2000	0.55897	195	2.4902	0.49908	0.23118	0.31621	0.78770
2001	0.37545	277	3.6371	0.72892	0.21811	0.47362	1.12184
2002	0.60154	389	4.6259	0.92709	0.14544	0.69415	1.23820
2003	0.46786	280	5.1975	1.04166	0.16586	0.74927	1.44815
2004	0.50735	272	8.4769	1.69890	0.15104	1.25810	2.29414
2005	0.51899	79	9.0527	1.81428	0.24654	1.11612	2.94916
2006	0.55288	208	9.0134	1.80641	0.16206	1.30908	2.49269
2007	0.33974	156	3.7793	0.75743	0.27013	0.44548	1.28783
2008	0.48276	145	4.8905	0.98012	0.20047	0.65897	1.45778
2009	0.58986	217	11.3507	2.27484	0.13737	1.73058	2.99026
2010	0.49718	177	7.7416	1.55154	0.17195	1.10280	2.18287
2011	0.37356	522	4.8770	0.97743	0.12795	0.75753	1.26115