2005 Flounder Report for Fish and Shellfish Monitoring

Massachusetts Water Resources Authority
Environmental Quality Department
Report ENQUAD 2006-14

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2005 FLOUNDER REPORT

FOR

FISH AND SHELLFISH MONITORING
Task 21
MWRA Harbor and Outfall Monitoring Project

Submitted to

MWRA Water Resources Authority
Environmental Quality Department
100 First Avenue
Charlestown Navy Yard
Boston, MA 02129
(617) 242-6000

Prepared by:

Michael J. Moore
Woods Hole Oceanographic Institution
Woods Hole, MA 02543
(508) 289-3228

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1.0 Introduction

Between May 3 and 5, 2005, the Flounder Survey Cruise (FF051) was conducted at stations located in the Massachusetts and Cape Cod Bays in the vicinity of the new sewage Outfall, at Deer Island Flats, Nantasket Beach, and Eastern Cape Cod Bay (the histology stations). Additional surveys for detection of external lesions were conducted in June and September 2004 (FF04SP1-2) and January and March 2005 (FF05SP1-3) at these and other stations as described in a series of cruise reports. These surveys represent the continuation of flounder monitoring as part of MWRA's Harbor and Outfall Monitoring Program as well as additional surveys to address the observation of blind side ulcers. This report presents the results of the May 2005 survey as well as the results of the additional 2004 and 2005 ulcer surveys.

2.0 Methods

The fish and shellfish QAPP (Lefkovitz *et. al.,* 2004) contains additional details on survey/sampling methods. At each of the sampling sites (Figure 1), otter-trawl tows were conducted to collect a target of 50 sexually mature (4-5 years old) winter flounder. All specimens were weighed and standard and fork length determined. Scales were taken from each specimen. Each flounder was examined externally and their fin erosion, bent fin ray, ulcer, net damage and lymphocystis condition noted on a scale from 0 (absent) to 4 (severe). In the case of ulcers, a score of 1 indicated a single ulcer present, a score of 2, indicated 2 ulcers present etc. Presence of healed ulcers was also recorded. In addition for fish from the 4 histology stations, the liver was removed and examined for grossly visible abnormalities. The livers were removed and serially sliced, with three equidistant slices preserved in formalin for histological analysis. Liver slices were processed routinely for embedment in paraffin, sectioning at 5 microns and staining with hematoxylin and eosin. Slides were then examined by bright field microscopy for presence and severity of a defined suite of liver lesions as described in the QAPP. Scales from the eyed side of the peduncle were removed for age analysis by counting of growth rings.

Additional surveys in both 2004 and 2005 specifically conducted to evaluate the presence of blind side ulcers focused solely on recording morphological data. No histological samples were collected from these surveys.

3.0 Results

Catch per unit effort (Table 2,Figure 2): The winter flounder resource was at similar low levels to most other years of the study with the exception of Deer Island that was at a high level, seen only once before in 2002. At the Outfall Site, the resource had been rising steadily since 2000, but fell back to pre-2000 levels in 2005.

Standard Length (Table 2, Figure 3): A general trend of increasing standard length continued for every station in 2005.

Average Age (Table 2, Figure 4): The average age of flounder at each station remained between four and five years.

Prevalence of histological lesions: Neoplasms were absent from all stations in 2005 (Table 1). Centrotubular hydropic vacuolation (Figure 5) prevalence was comparable to, or lower than, in previous years at all stations.

Prevalence of ulcers: Table 3 shows the prevalence of ulcers at stations sampled in 2004 and 2005. There is a consistent pattern of lesion prevalence increasing from late winter into spring and then regressing from spring into summer as healed lesions increase in prevalence.

4.0 Discussion

The flounder resource did not show dramatic change as compared to previous years, although the steady increase in average age over recent years was of interest.

Histological lesions have not changed dramatically since previous years, with an ongoing absence of evidence of a cumulative increase in chemical–associated lesions at the Outfall Site. Hydropic vacuolation prevalence corrected for age of fish has more or less fallen at that site since 2002.

Ulcer prevalence followed the same spatial and temporal pattern as observed in recent years. The more frequent surveys over 2004/2005 confirmed that the syndrome appears to have peak late winter to early spring prevalence with repair of the lesions into the early summer.

5.0 Reference

Lefkovitz, L, SL Pala, and MJ Moore. 2004. **Combined Work/Quality Assurance Project Plan (CW/QAPP) for Fish and Shellfish Monitoring: 2004-2005**. Boston: Massachusetts Water Resources Authority. Report ENQUAD ms-078 Version 1. 34 p.

Table 1. Prevalence (%) of Lesions in Winter Flounder Liver from Five Stations in Massachusetts and Cape Cod Bays in 2005 (FF051 only).

Year	Parameter	DIF	NB	OS	ECCB
		%	%	%	%
2005	Biliary Proliferation	36	52	66	56
2005	Centrotubular HV	20	18	8	2
2005	Focal HV	0	0	0	0
2005	Macrophage Aggregation	62	76	86	70
2005	Neoplasm	0	0	0	0
2005	Tubular HV	14	8	10	0
Note: No histology collected during FF05SP1 - 3					

Table 2. Average Morphology Results for 2005 (Includes FF05SP1 – 3).

		DIF		NB		OS		ECCB		FF09	
		Value	N	Value	N	Value	N	Value	N	Value	N
AGE (y)	Mean	4.80	50	4.34	50	4.96	54	4.42	50	4.94	129
	Stdev	1.1		0.9		1.2		1.0		1.1	
WEIGHT (g)	Mean	731.2	49	626.8	99	669.7	103	558.6	50	639.0	129
	Stdev	217.9		150.3		195.1		156.0		272.4	
STAN_LEN (mm)	Mean	328.7	49	308.7	99	314.3	103	301.7	50	294.7	129
	Stdev	34.1		23.9		32.5		23.8		37.4	
TOTAL_LEN (mm)	Mean	391.0	50	374.9	99	381.0	103	365.2	50	360.3	129
	Stdev	39.7		29.5		38.3		28.7		42.6	
CPUE (1)	n/a	3.23		0.36		1.07		1.1		0.25	

(1) 2005 CPUE data is from the May 2005 survey (FF051)
n/a indicates 'not applicable'

Table 3. Prevalence of Winter Flounder with Active and Healed Ulcerative Dermatitis.

Date	DIF			BS			NB			OS			ECCB			FF09		
	%U	% H	*n*	%U	% H	*n*	%U	% H	*n*	%U	% H	*n*	%U	% H	*n*	%U	% H	*n*
April - May 2004 (FF041)	22	0	50	12	0	50	30	0	50	36	0	50	0	0	50	42	0	50
June 2004 (FF04SP1)	0	2	50	0	6	48	6	0	16	14	6	50	NS	NS	NS	NS	NS	NS
September 04 (FF04SP2)	-	-	0	0	0	1	NS	NS	NS	NS	NS	NS	NS	NS	NS	0	8	50
January 2005 (FF05SP1)	-	-	0	-	-	0	NS	NS	NS	0	0	4	NS	NS	NS	0	0	50
March 2005 (FF05SP2)	-	-	0	NS	NS	NS	NS	NS	NS	-	-	0	NS	NS	NS	10	3	29
May 2005 (FF051)	0	0	50	NS	NS	NS	14	2	50	14	0	50	0	0	50	16	0	50
June 2005 (FF05SP3)	NS	NS	NS	NS	NS	NS	0	4	50	4	6	50	NS	NS	NS	-	-	0
Total	**8**	**1**	**165**	**9**	**2**	**149**	**12**	**1**	**216**	**18**	**2**	**254**	**0**	**0**	**150**	**14**	**2**	**229**

%U = Percent of winter flounder with ulcerations. %H = Percent of winter flounder with healed ulcers.
n = Number of winter flounder sampled. 0 = Sampled but no fish caught. NS = Not sampled.

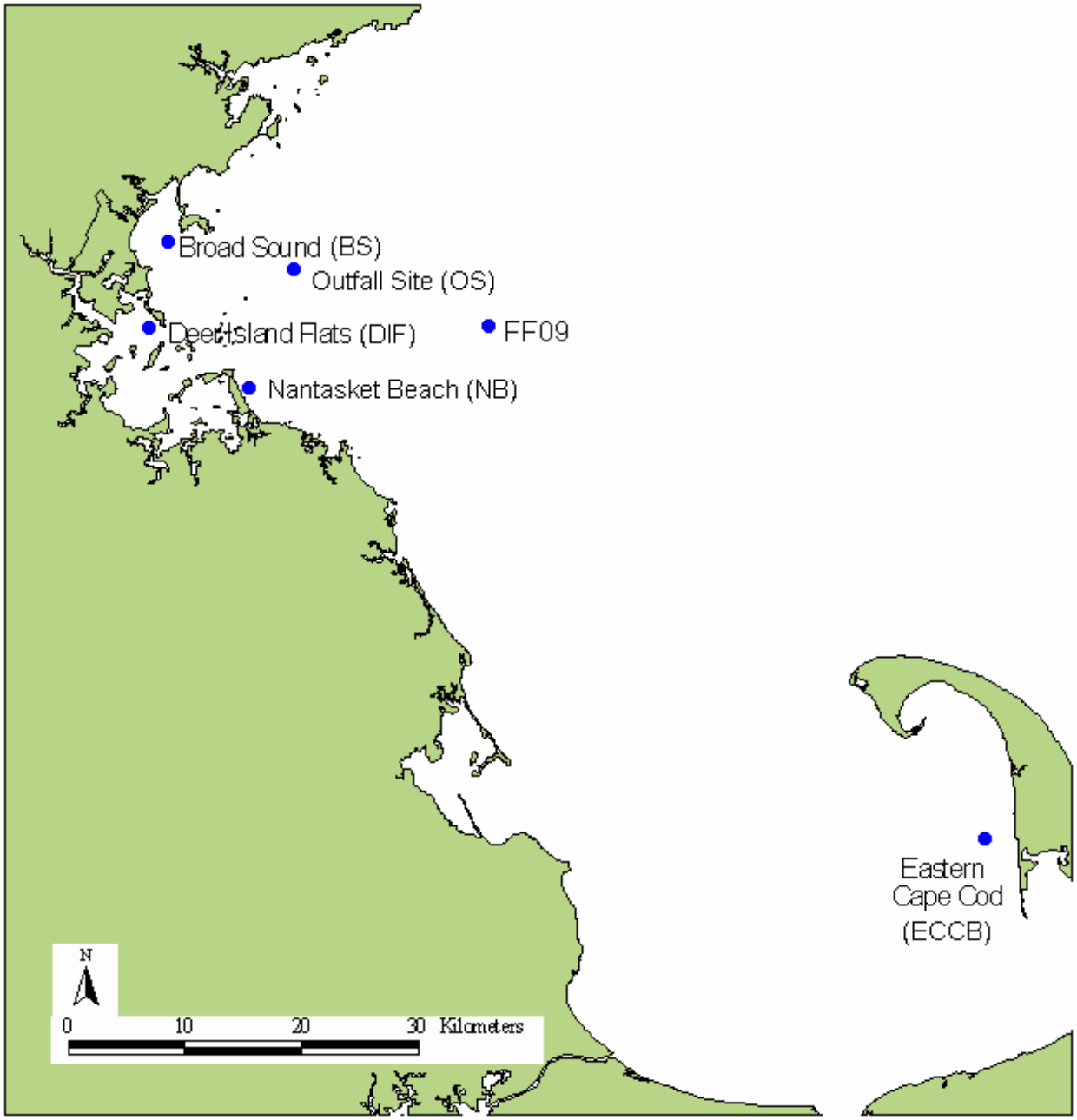

Figure 1. Flounder Sampling Stations

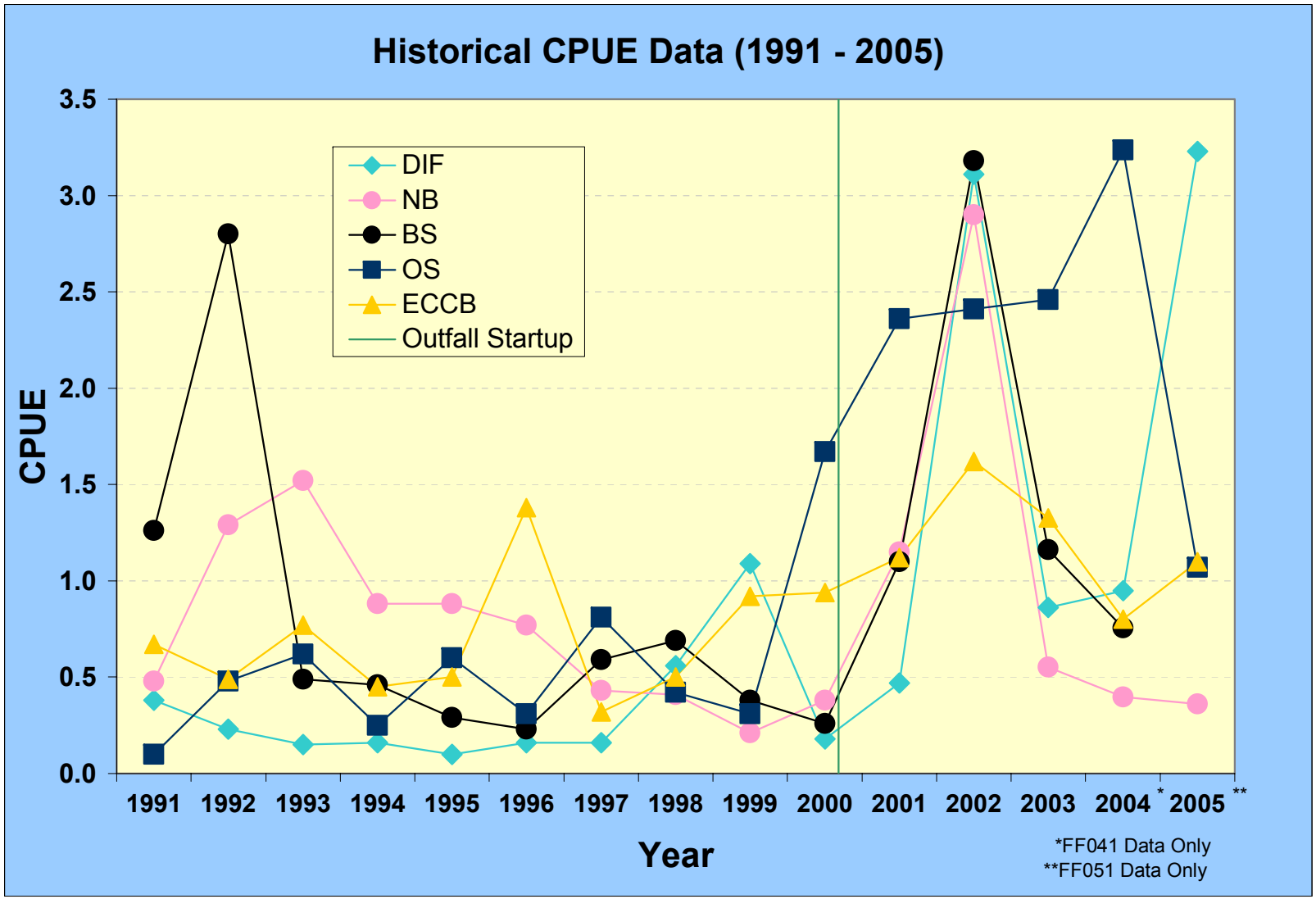

Figure 2. Number of flounder greater than 300 mm total length caught per minute of trawl bottom time at each station 1991 - 2005

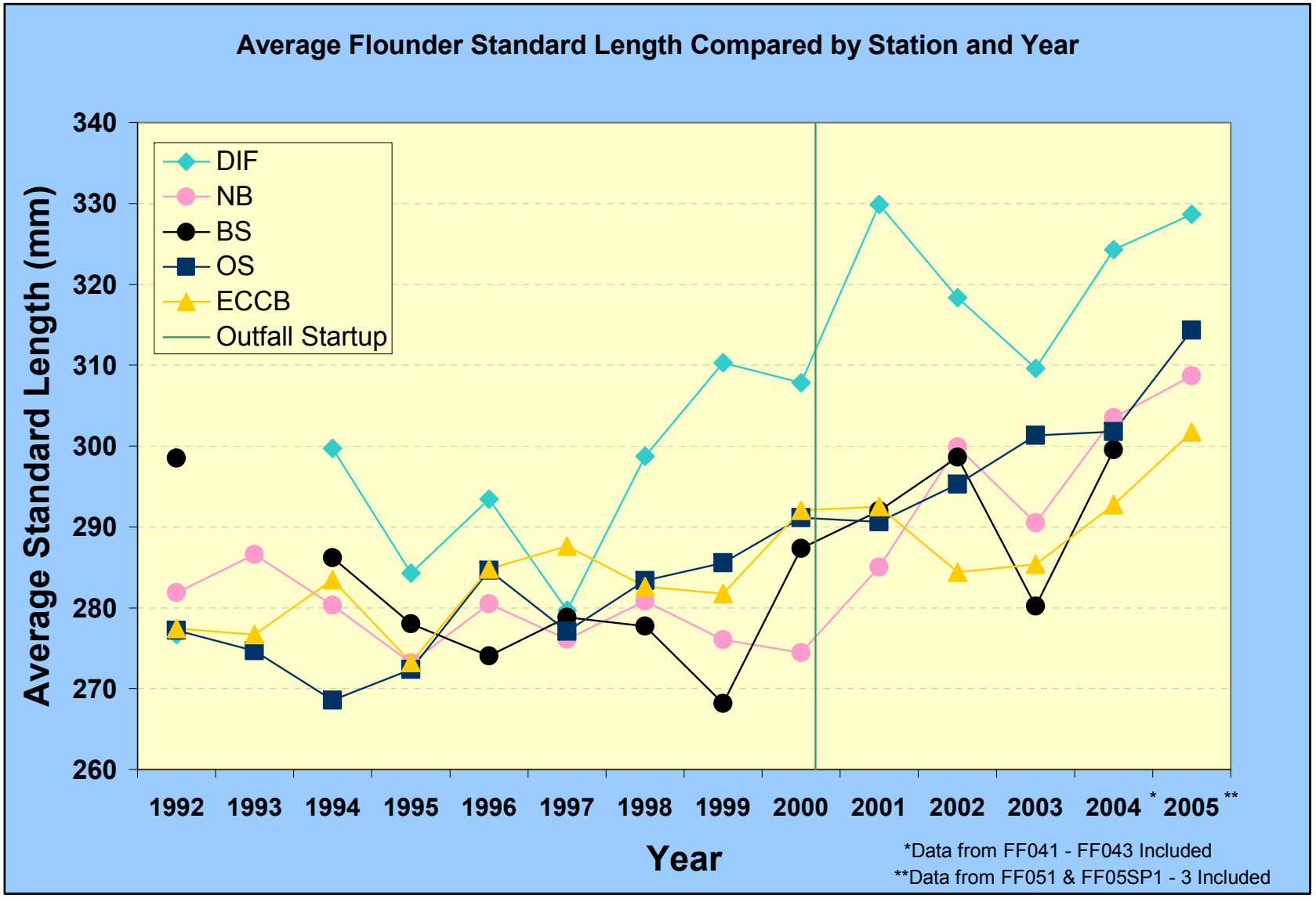

Figure 3. Winter flounder average standard length 1992-2005

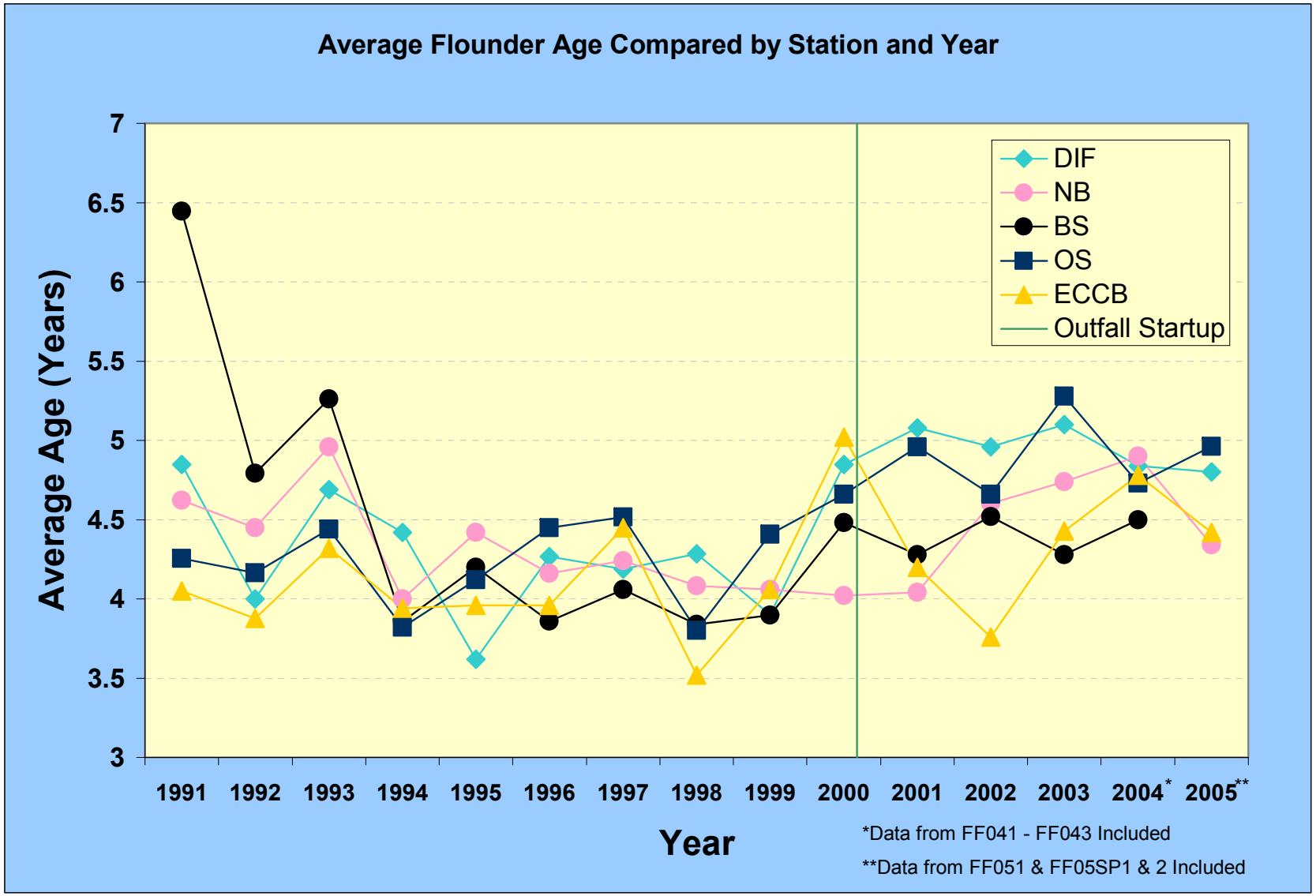

Figure 4. Average age for winter flounder for each station since 1991

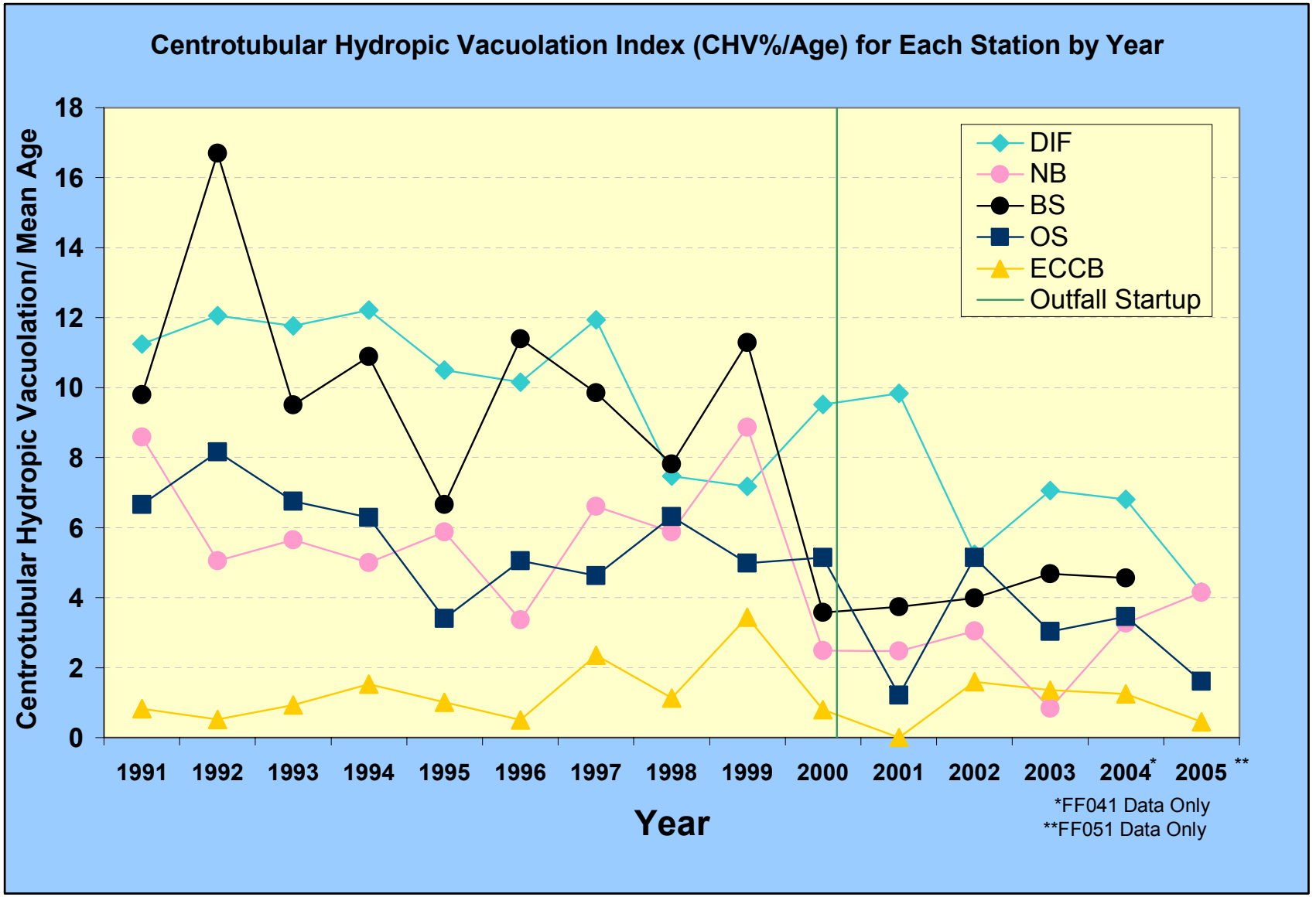

Figure 5. Age corrected prevalence of centrotubular hydropic vacuolation in winter flounder liver.

Attachment A – Individual Morphology Data For Winter Flounder in 2005 (FF051, FF05SP1, FF05SP2, FF05SP3)

Individual Morphology Data (Age, Length and Weight) for Winter Flounder in 2005.

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF051	DIF	FF0511001	6.0	360.0	435.0	910.0
FF051	DIF	FF0511002	3.0	280.0	335.0	s
FF051	DIF	FF0511003	4.0	s	383.0	750.0
FF051	DIF	FF0511004	3.0	285.0	340.0	480.0
FF051	DIF	FF0511005	5.0	320.0	390.0	670.0
FF051	DIF	FF0511006	4.0	310.0	375.0	650.0
FF051	DIF	FF0511007	4.0	315.0	365.0	550.0
FF051	DIF	FF0511008	6.0	355.0	420.0	880.0
FF051	DIF	FF0511009	4.0	325.0	392.0	690.0
FF051	DIF	FF0511010	4.0	315.0	370.0	560.0
FF051	DIF	FF0511011	5.0	375.0	435.0	1050.0
FF051	DIF	FF0511012	6.0	360.0	430.0	850.0
FF051	DIF	FF0511013	6.0	400.0	470.0	1260.0
FF051	DIF	FF0511014	4.0	310.0	380.0	600.0
FF051	DIF	FF0511015	5.0	365.0	430.0	850.0
FF051	DIF	FF0511016	3.0	255.0	300.0	300.0
FF051	DIF	FF0511017	4.0	315.0	375.0	530.0
FF051	DIF	FF0511018	5.0	335.0	390.0	690.0
FF051	DIF	FF0511019	6.0	365.0	435.0	1010.0
FF051	DIF	FF0511020	5.0	315.0	377.0	640.0
FF051	DIF	FF0511021	6.0	350.0	420.0	850.0
FF051	DIF	FF0511022	4.0	320.0	380.0	680.0
FF051	DIF	FF0511023	5.0	340.0	400.0	700.0
FF051	DIF	FF0511024	4.0	300.0	355.0	560.0
FF051	DIF	FF0511025	5.0	340.0	400.0	800.0
FF051	DIF	FF0511026	6.0	350.0	430.0	1000.0
FF051	DIF	FF0511027	7.0	380.0	450.0	1110.0
FF051	DIF	FF0511028	4.0	325.0	377.0	680.0
FF051	DIF	FF0511029	6.0	340.0	414.0	790.0
FF051	DIF	FF0511030	3.0	260.0	315.0	390.0
FF051	DIF	FF0511031	4.0	310.0	370.0	650.0
FF051	DIF	FF0511032	6.0	345.0	405.0	730.0
FF051	DIF	FF0511033	6.0	360.0	425.0	850.0
FF051	DIF	FF0511034	5.0	325.0	385.0	660.0
FF051	DIF	FF0511035	4.0	295.0	345.0	480.0
FF051	DIF	FF0511036	4.0	315.0	365.0	580.0
FF051	DIF	FF0511037	8.0	385.0	465.0	1150.0
FF051	DIF	FF0511038	4.0	320.0	375.0	600.0
FF051	DIF	FF0511039	4.0	330.0	400.0	700.0
FF051	DIF	FF0511040	5.0	375.0	435.0	1000.0
FF051	DIF	FF0511041	3.0	275.0	322.0	500.0
FF051	DIF	FF0511042	7.0	380.0	455.0	1300.0
FF051	DIF	FF0511043	5.0	325.0	395.0	700.0
FF051	DIF	FF0511044	6.0	370.0	435.0	880.0
FF051	DIF	FF0511045	5.0	290.0	345.0	520.0
FF051	DIF	FF0511046	4.0	295.0	355.0	630.0
FF051	DIF	FF0511047	4.0	280.0	350.0	530.0
FF051	DIF	FF0511048	5.0	325.0	390.0	610.0
FF051	DIF	FF0511049	5.0	350.0	420.0	800.0
FF051	DIF	FF0511050	4.0	290.0	345.0	480.0
FF051	ECCB	FF0515001	5.0	325.0	392.0	750.0
FF051	ECCB	FF0515002	3.0	275.0	320.0	380.0
FF051	ECCB	FF0515003	4.0	285.0	345.0	500.0
FF051	ECCB	FF0515004	4.0	300.0	360.0	420.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
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FF051	ECCB	FF0515006	4.0	315.0	380.0	640.0
FF051	ECCB	FF0515007	5.0	320.0	385.0	640.0
FF051	ECCB	FF0515008	4.0	270.0	330.0	410.0
FF051	ECCB	FF0515009	6.0	325.0	400.0	740.0
FF051	ECCB	FF0515010	4.0	295.0	355.0	520.0
FF051	ECCB	FF0515011	4.0	285.0	345.0	500.0
FF051	ECCB	FF0515012	5.0	320.0	382.0	720.0
FF051	ECCB	FF0515013	5.0	330.0	397.0	720.0
FF051	ECCB	FF0515014	4.0	310.0	380.0	560.0
FF051	ECCB	FF0515015	4.0	275.0	340.0	400.0
FF051	ECCB	FF0515016	4.0	290.0	355.0	530.0
FF051	ECCB	FF0515017	4.0	275.0	335.0	440.0
FF051	ECCB	FF0515018	3.0	275.0	325.0	400.0
FF051	ECCB	FF0515019	4.0	305.0	365.0	550.0
FF051	ECCB	FF0515020	3.0	270.0	325.0	380.0
FF051	ECCB	FF0515021	4.0	290.0	350.0	520.0
FF051	ECCB	FF0515022	4.0	290.0	350.0	470.0
FF051	ECCB	FF0515023	4.0	270.0	330.0	400.0
FF051	ECCB	FF0515024	8.0	330.0	400.0	860.0
FF051	ECCB	FF0515025	5.0	325.0	395.0	620.0
FF051	ECCB	FF0515026	5.0	315.0	375.0	500.0
FF051	ECCB	FF0515027	4.0	272.0	325.0	380.0
FF051	ECCB	FF0515028	4.0	305.0	370.0	570.0
FF051	ECCB	FF0515029	6.0	335.0	410.0	840.0
FF051	ECCB	FF0515030	4.0	290.0	350.0	460.0
FF051	ECCB	FF0515031	5.0	325.0	385.0	620.0
FF051	ECCB	FF0515032	5.0	335.0	405.0	780.0
FF051	ECCB	FF0515033	4.0	290.0	350.0	550.0
FF051	ECCB	FF0515034	7.0	355.0	430.0	860.0
FF051	ECCB	FF0515035	4.0	280.0	340.0	410.0
FF051	ECCB	FF0515036	5.0	280.0	345.0	400.0
FF051	ECCB	FF0515037	5.0	325.0	395.0	630.0
FF051	ECCB	FF0515038	4.0	300.0	370.0	580.0
FF051	ECCB	FF0515039	4.0	290.0	360.0	450.0
FF051	ECCB	FF0515040	3.0	255.0	315.0	350.0
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FF051	ECCB	FF0515043	4.0	305.0	375.0	700.0
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FF051	ECCB	FF0515046	3.0	290.0	345.0	430.0
FF051	ECCB	FF0515047	4.0	310.0	380.0	560.0
FF051	ECCB	FF0515048	4.0	310.0	380.0	570.0
FF051	ECCB	FF0515049	4.0	275.0	335.0	380.0
FF051	ECCB	FF0515050	5.0	325.0	380.0	530.0
FF051	FF09	FF0518001	5.0	335.0	405.0	1000.0
FF051	FF09	FF0518002	7.0	350.0	420.0	940.0
FF051	FF09	FF0518003	5.0	326.0	402.0	940.0
FF051	FF09	FF0518004	8.0	365.0	452.0	1150.0
FF051	FF09	FF0518005	4.0	295.0	355.0	500.0
FF051	FF09	FF0518006	4.0	290.0	350.0	570.0
FF051	FF09	FF0518007	5.0	290.0	360.0	530.0
FF051	FF09	FF0518008	5.0	315.0	385.0	700.0
FF051	FF09	FF0518009	7.0	369.0	450.0	1240.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
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FF051	FF09	FF0518013	3.0	255.0	305.0	350.0
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FF051	FF09	FF0518015	9.0	415.0	499.0	1950.0
FF051	FF09	FF0518016	6.0	350.0	415.0	900.0
FF051	FF09	FF0518017	5.0	280.0	350.0	520.0
FF051	FF09	FF0518018	4.0	300.0	360.0	650.0
FF051	FF09	FF0518019	7.0	370.0	445.0	1160.0
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FF051	FF09	FF0518032	5.0	325.0	394.0	830.0
FF051	FF09	FF0518033	4.0	275.0	340.0	540.0
FF051	FF09	FF0518034	4.0	290.0	355.0	520.0
FF051	FF09	FF0518035	4.0	290.0	345.0	540.0
FF051	FF09	FF0518036	4.0	295.0	364.0	650.0
FF051	FF09	FF0518037	4.0	280.0	355.0	470.0
FF051	FF09	FF0518038	3.0	255.0	308.0	360.0
FF051	FF09	FF0518039	4.0	270.0	330.0	500.0
FF051	FF09	FF0518040	6.0	335.0	410.0	930.0
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FF051	NB	FF0512005	5.0	320.0	395.0	600.0
FF051	NB	FF0512006	4.0	290.0	360.0	520.0
FF051	NB	FF0512007	4.0	280.0	340.0	540.0
FF051	NB	FF0512008	4.0	285.0	355.0	560.0
FF051	NB	FF0512009	4.0	320.0	385.0	720.0
FF051	NB	FF0512010	4.0	290.0	350.0	510.0
FF051	NB	FF0512011	5.0	340.0	410.0	790.0
FF051	NB	FF0512012	5.0	315.0	385.0	700.0
FF051	NB	FF0512013	5.0	310.0	383.0	570.0
FF051	NB	FF0512014	4.0	315.0	382.0	600.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF051	NB	FF0512015	4.0	305.0	375.0	520.0
FF051	NB	FF0512016	5.0	325.0	405.0	760.0
FF051	NB	FF0512017	5.0	330.0	400.0	590.0
FF051	NB	FF0512018	6.0	355.0	435.0	1150.0
FF051	NB	FF0512019	3.0	255.0	310.0	380.0
FF051	NB	FF0512020	3.0	275.0	340.0	480.0
FF051	NB	FF0512021	3.0	270.0	325.0	430.0
FF051	NB	FF0512022	4.0	310.0	370.0	640.0
FF051	NB	FF0512023	4.0	280.0	345.0	550.0
FF051	NB	FF0512024	4.0	280.0	340.0	440.0
FF051	NB	FF0512025	4.0	285.0	350.0	510.0
FF051	NB	FF0512026	4.0	310.0	380.0	640.0
FF051	NB	FF0512027	4.0	305.0	370.0	520.0
FF051	NB	FF0512028	4.0	305.0	380.0	650.0
FF051	NB	FF0512029	6.0	335.0	415.0	780.0
FF051	NB	FF0512030	4.0	280.0	340.0	480.0
FF051	NB	FF0512031	5.0	310.0	390.0	690.0
FF051	NB	FF0512032	4.0	305.0	370.0	720.0
FF051	NB	FF0512033	3.0	270.0	320.0	420.0
FF051	NB	FF0512034	5.0	315.0	365.0	540.0
FF051	NB	FF0512035	5.0	325.0	395.0	560.0
FF051	NB	FF0512036	5.0	335.0	395.0	650.0
FF051	NB	FF0512037	4.0	300.0	365.0	520.0
FF051	NB	FF0512038	4.0	315.0	372.0	600.0
FF051	NB	FF0512039	5.0	305.0	370.0	550.0
FF051	NB	FF0512040	4.0	295.0	355.0	500.0
FF051	NB	FF0512041	4.0	310.0	375.0	700.0
FF051	NB	FF0512042	7.0	375.0	450.0	1150.0
FF051	NB	FF0512043	5.0	325.0	395.0	770.0
FF051	NB	FF0512044	4.0	310.0	370.0	560.0
FF051	NB	FF0512045	3.0	285.0	340.0	470.0
FF051	NB	FF0512046	4.0	295.0	345.0	490.0
FF051	NB	FF0512047	4.0	310.0	360.0	510.0
FF051	NB	FF0512048	5.0	335.0	400.0	660.0
FF051	NB	FF0512049	3.0	260.0	310.0	340.0
FF051	NB	FF0512050	3.0	290.0	340.0	480.0
FF051	OS	FF0514001	4.0	300.0	365.0	520.0
FF051	OS	FF0514002	6.0	360.0	430.0	880.0
FF051	OS	FF0514003	4.0	320.0	390.0	780.0
FF051	OS	FF0514004	5.0	330.0	370.0	566.0
FF051	OS	FF0514005	6.0	360.0	440.0	840.0
FF051	OS	FF0514006	5.0	330.0	400.0	690.0
FF051	OS	FF0514007	3.0	265.0	320.0	390.0
FF051	OS	FF0514008	6.0	360.0	430.0	920.0
FF051	OS	FF0514009	8.0	375.0	440.0	940.0
FF051	OS	FF0514010	4.0	310.0	372.0	560.0
FF051	OS	FF0514011	5.0	290.0	365.0	540.0
FF051	OS	FF0514012	5.0	310.0	375.0	660.0
FF051	OS	FF0514013	6.0	350.0	430.0	930.0
FF051	OS	FF0514014	5.0	290.0	350.0	560.0
FF051	OS	FF0514015	5.0	325.0	400.0	750.0
FF051	OS	FF0514016	7.0	375.0	445.0	1000.0
FF051	OS	FF0514017	4.0	280.0	350.0	510.0
FF051	OS	FF0514018	4.0	308.0	372.0	700.0
FF051	OS	FF0514019	3.0	275.0	335.0	440.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF051	OS	FF0514020	4.0	280.0	345.0	420.0
FF051	OS	FF0514021	5.0	305.0	365.0	600.0
FF051	OS	FF0514022	6.0	345.0	418.0	740.0
FF051	OS	FF0514023	4.0	315.0	385.0	690.0
FF051	OS	FF0514024	4.0	300.0	365.0	620.0
FF051	OS	FF0514025	4.0	325.0	395.0	730.0
FF051	OS	FF0514026	4.0	280.0	345.0	500.0
FF051	OS	FF0514027	4.0	275.0	335.0	420.0
FF051	OS	FF0514028	4.0	275.0	335.0	395.0
FF051	OS	FF0514029	6.0	340.0	410.0	850.0
FF051	OS	FF0514030	6.0	320.0	400.0	660.0
FF051	OS	FF0514031	9.0	395.0	475.0	1150.0
FF051	OS	FF0514032	5.0	325.0	395.0	670.0
FF051	OS	FF0514033	5.0	320.0	390.0	650.0
FF051	OS	FF0514034	4.0	315.0	385.0	750.0
FF051	OS	FF0514035	5.0	335.0	405.0	920.0
FF051	OS	FF0514036	6.0	350.0	430.0	920.0
FF051	OS	FF0514037	6.0	355.0	432.0	900.0
FF051	OS	FF0514038	5.0	295.0	355.0	470.0
FF051	OS	FF0514039	5.0	315.0	375.0	540.0
FF051	OS	FF0514040	3.0	270.0	325.0	340.0
FF051	OS	FF0514041	4.0	280.0	335.0	520.0
FF051	OS	FF0514042	6.0	345.0	415.0	690.0
FF051	OS	FF0514043	5.0	300.0	370.0	660.0
FF051	OS	FF0514044	7.0	365.0	435.0	840.0
FF051	OS	FF0514045	7.0	375.0	460.0	1000.0
FF051	OS	FF0514046	5.0	305.0	370.0	520.0
FF051	OS	FF0514047	6.0	345.0	418.0	960.0
FF051	OS	FF0514048	4.0	300.0	365.0	590.0
FF051	OS	FF0514049	4.0	285.0	350.0	520.0
FF051	OS	FF0514050	3.0	265.0	310.0	330.0
FF05SP1	FF09	FF05SP18001	4.0	292.0	311.0	330.0
FF05SP1	FF09	FF05SP18002	6.0	265.0	320.0	380.0
FF05SP1	FF09	FF05SP18003	6.0	265.0	325.0	480.0
FF05SP1	FF09	FF05SP18004	5.0	314.0	370.0	660.0
FF05SP1	FF09	FF05SP18005	5.0	245.0	305.0	360.0
FF05SP1	FF09	FF05SP18006	6.0	270.0	330.0	465.0
FF05SP1	FF09	FF05SP18007	5.0	275.0	345.0	530.0
FF05SP1	FF09	FF05SP18008	4.0	261.0	320.0	395.0
FF05SP1	FF09	FF05SP18009	5.0	252.0	311.0	425.0
FF05SP1	FF09	FF05SP18010	4.0	261.0	320.0	430.0
FF05SP1	FF09	FF05SP18011	8.0	383.0	451.0	1240.0
FF05SP1	FF09	FF05SP18012	4.0	310.0	361.0	580.0
FF05SP1	FF09	FF05SP18013	5.0	284.0	344.0	430.0
FF05SP1	FF09	FF05SP18014	5.0	253.0	310.0	400.0
FF05SP1	FF09	FF05SP18015	4.0	260.0	320.0	405.0
FF05SP1	FF09	FF05SP18016	6.0	321.0	393.0	800.0
FF05SP1	FF09	FF05SP18017	4.0	250.0	310.0	380.0
FF05SP1	FF09	FF05SP18018	4.0	253.0	301.0	380.0
FF05SP1	FF09	FF05SP18019	5.0	330.0	392.0	730.0
FF05SP1	FF09	FF05SP18020	7.0	331.0	412.0	840.0
FF05SP1	FF09	FF05SP18021	4.0	302.0	380.0	695.0
FF05SP1	FF09	FF05SP18022	4.0	264.0	324.0	400.0
FF05SP1	FF09	FF05SP18023	4.0	214.0	312.0	360.0
FF05SP1	FF09	FF05SP18024	4.0	283.0	354.0	575.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF05SP1	FF09	FF05SP18025	4.0	261.0	339.0	420.0
FF05SP1	FF09	FF05SP18026	6.0	282.0	353.0	605.0
FF05SP1	FF09	FF05SP18027	6.0	261.0	321.0	440.0
FF05SP1	FF09	FF05SP18028	4.0	240.0	300.0	345.0
FF05SP1	FF09	FF05SP18029	4.0	252.0	311.0	280.0
FF05SP1	FF09	FF05SP18030	4.0	271.0	331.0	600.0
FF05SP1	FF09	FF05SP18031	6.0	362.0	440.0	1260.0
FF05SP1	FF09	FF05SP18032	5.0	312.0	374.0	700.0
FF05SP1	FF09	FF05SP18033	5.0	274.0	342.0	600.0
FF05SP1	FF09	FF05SP18034	4.0	271.0	340.0	500.0
FF05SP1	FF09	FF05SP18035	7.0	310.0	380.0	660.0
FF05SP1	FF09	FF05SP18036	5.0	226.0	320.0	405.0
FF05SP1	FF09	FF05SP18037	6.0	350.0	420.0	1205.0
FF05SP1	FF09	FF05SP18038	5.0	284.0	352.0	620.0
FF05SP1	FF09	FF05SP18039	5.0	281.0	350.0	645.0
FF05SP1	FF09	FF05SP18040	5.0	262.0	321.0	445.0
FF05SP1	FF09	FF05SP18041	4.0	261.0	313.0	415.0
FF05SP1	FF09	FF05SP18042	5.0	272.0	340.0	450.0
FF05SP1	FF09	FF05SP18043	5.0	272.0	333.0	490.0
FF05SP1	FF09	FF05SP18044	5.0	281.0	350.0	610.0
FF05SP1	FF09	FF05SP18045	5.0	273.0	334.0	530.0
FF05SP1	FF09	FF05SP18046	5.0	284.0	342.0	580.0
FF05SP1	FF09	FF05SP18047	5.0	290.0	351.0	500.0
FF05SP1	FF09	FF05SP18048	5.0	274.0	344.0	605.0
FF05SP1	FF09	FF05SP18049	4.0	273.0	340.0	620.0
FF05SP1	FF09	FF05SP18050	4.0	274.0	334.0	470.0
FF05SP1	OS	FF05SP14001	4.0	280.0	341.0	520.0
FF05SP1	OS	FF05SP14002	4.0	262.0	330.0	440.0
FF05SP1	OS	FF05SP14003	5.0	264.0	322.0	500.0
FF05SP1	OS	FF05SP14004	5.0	273.0	330.0	500.0
FF05SP2	FF09	FF05SP28001	5.0	290.0	350.0	520.0
FF05SP2	FF09	FF05SP28002	6.0	295.0	365.0	650.0
FF05SP2	FF09	FF05SP28003	5.0	345.0	415.0	1000.0
FF05SP2	FF09	FF05SP28004	6.0	325.0	400.0	860.0
FF05SP2	FF09	FF05SP28005	4.0	290.0	350.0	600.0
FF05SP2	FF09	FF05SP28006	6.0	300.0	360.0	620.0
FF05SP2	FF09	FF05SP28007	5.0	315.0	390.0	850.0
FF05SP2	FF09	FF05SP28008	4.0	295.0	370.0	680.0
FF05SP2	FF09	FF05SP28009	6.0	295.0	365.0	620.0
FF05SP2	FF09	FF05SP28010	5.0	275.0	345.0	510.0
FF05SP2	FF09	FF05SP28011	6.0	320.0	385.0	800.0
FF05SP2	FF09	FF05SP28012	5.0	355.0	425.0	1120.0
FF05SP2	FF09	FF05SP28013	5.0	275.0	335.0	490.0
FF05SP2	FF09	FF05SP28014	4.0	285.0	345.0	500.0
FF05SP2	FF09	FF05SP28015	6.0	330.0	400.0	900.0
FF05SP2	FF09	FF05SP28016	6.0	340.0	421.0	1060.0
FF05SP2	FF09	FF05SP28017	5.0	235.0	302.0	650.0
FF05SP2	FF09	FF05SP28018	5.0	255.0	315.0	450.0
FF05SP2	FF09	FF05SP28019	5.0	310.0	375.0	620.0
FF05SP2	FF09	FF05SP28020	5.0	280.0	345.0	420.0
FF05SP2	FF09	FF05SP28021	5.0	350.0	420.0	1000.0
FF05SP2	FF09	FF05SP28022	5.0	305.0	382.0	520.0
FF05SP2	FF09	FF05SP28023	5.0	300.0	360.0	540.0
FF05SP2	FF09	FF05SP28024	4.0	245.0	300.0	360.0
FF05SP2	FF09	FF05SP28025	4.0	300.0	375.0	650.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF05SP2	FF09	FF05SP28026	4.0	275.0	340.0	480.0
FF05SP2	FF09	FF05SP28027	5.0	290.0	355.0	640.0
FF05SP2	FF09	FF05SP28028	5.0	250.0	315.0	365.0
FF05SP2	FF09	FF05SP28029	4.0	255.0	312.0	370.0
FF05SP3	NB	FF05SP32001	NA	265.0	330.0	390.0
FF05SP3	NB	FF05SP32002	NA	295.0	365.0	540.0
FF05SP3	NB	FF05SP32003	NA	285.0	345.0	520.0
FF05SP3	NB	FF05SP32004	NA	325.0	400.0	790.0
FF05SP3	NB	FF05SP32005	NA	325.0	395.0	700.0
FF05SP3	NB	FF05SP32006	NA	305.0	370.0	650.0
FF05SP3	NB	FF05SP32007	NA	330.0	405.0	780.0
FF05SP3	NB	FF05SP32008	NA	260.0	315.0	400.0
FF05SP3	NB	FF05SP32009	NA	275.0	335.0	500.0
FF05SP3	NB	FF05SP32010	NA	310.0	380.0	700.0
FF05SP3	NB	FF05SP32011	NA	295.0	370.0	600.0
FF05SP3	NB	FF05SP32012	NA	315.0	380.0	640.0
FF05SP3	NB	FF05SP32013	NA	345.0	420.0	800.0
FF05SP3	NB	FF05SP32014	NA	310.0	345.0	590.0
FF05SP3	NB	FF05SP32015	NA	340.0	415.0	850.0
FF05SP3	NB	FF05SP32016	NA	305.0	360.0	580.0
FF05SP3	NB	FF05SP32017	NA	310.0	370.0	550.0
FF05SP3	NB	FF05SP32018	NA	290.0	355.0	540.0
FF05SP3	NB	FF05SP32019	NA	s	s	s
FF05SP3	NB	FF05SP32020	NA	260.0	320.0	410.0
FF05SP3	NB	FF05SP32021	NA	320.0	380.0	600.0
FF05SP3	NB	FF05SP32022	NA	290.0	365.0	580.0
FF05SP3	NB	FF05SP32023	NA	310.0	380.0	630.0
FF05SP3	NB	FF05SP32024	NA	335.0	415.0	850.0
FF05SP3	NB	FF05SP32025	NA	285.0	345.0	480.0
FF05SP3	NB	FF05SP32026	NA	325.0	390.0	700.0
FF05SP3	NB	FF05SP32027	NA	335.0	410.0	800.0
FF05SP3	NB	FF05SP32028	NA	345.0	415.0	770.0
FF05SP3	NB	FF05SP32029	NA	355.0	425.0	870.0
FF05SP3	NB	FF05SP32030	NA	315.0	385.0	680.0
FF05SP3	NB	FF05SP32031	NA	310.0	380.0	690.0
FF05SP3	NB	FF05SP32032	NA	315.0	380.0	670.0
FF05SP3	NB	FF05SP32033	NA	320.0	385.0	650.0
FF05SP3	NB	FF05SP32034	NA	295.0	360.0	500.0
FF05SP3	NB	FF05SP32035	NA	305.0	365.0	600.0
FF05SP3	NB	FF05SP32036	NA	300.0	370.0	600.0
FF05SP3	NB	FF05SP32037	NA	320.0	395.0	650.0
FF05SP3	NB	FF05SP32038	NA	310.0	385.0	650.0
FF05SP3	NB	FF05SP32039	NA	295.0	360.0	550.0
FF05SP3	NB	FF05SP32040	NA	285.0	350.0	500.0
FF05SP3	NB	FF05SP32041	NA	300.0	370.0	600.0
FF05SP3	NB	FF05SP32042	NA	325.0	395.0	660.0
FF05SP3	NB	FF05SP32043	NA	340.0	420.0	900.0
FF05SP3	NB	FF05SP32044	NA	290.0	350.0	500.0
FF05SP3	NB	FF05SP32045	NA	305.0	380.0	640.0
FF05SP3	NB	FF05SP32046	NA	315.0	380.0	660.0
FF05SP3	NB	FF05SP32047	NA	290.0	355.0	480.0
FF05SP3	NB	FF05SP32048	NA	330.0	400.0	750.0
FF05SP3	NB	FF05SP32049	NA	315.0	385.0	660.0
FF05SP3	NB	FF05SP32050	NA	370.0	450.0	970.0
FF05SP3	OS	FF05SP34001	NA	285.0	340.0	520.0

		Param Code	AGE	STAN_LEN	TOTAL_LEN	WEIGHT
		Unit Code	y	mm	mm	g
Event Id	Stat Id	Bottle Id	Value	Value	Value	Value
FF05SP3	OS	FF05SP34002	NA	295.0	345.0	520.0
FF05SP3	OS	FF05SP34003	NA	330.0	400.0	650.0
FF05SP3	OS	FF05SP34004	NA	275.0	330.0	450.0
FF05SP3	OS	FF05SP34005	NA	355.0	425.0	880.0
FF05SP3	OS	FF05SP34006	NA	s	s	s
FF05SP3	OS	FF05SP34007	NA	340.0	420.0	970.0
FF05SP3	OS	FF05SP34008	NA	340.0	410.0	810.0
FF05SP3	OS	FF05SP34009	NA	320.0	390.0	750.0
FF05SP3	OS	FF05SP34010	NA	320.0	390.0	700.0
FF05SP3	OS	FF05SP34011	NA	325.0	395.0	760.0
FF05SP3	OS	FF05SP34012	NA	295.0	360.0	500.0
FF05SP3	OS	FF05SP34013	NA	280.0	335.0	390.0
FF05SP3	OS	FF05SP34014	NA	275.0	340.0	500.0
FF05SP3	OS	FF05SP34015	NA	340.0	410.0	870.0
FF05SP3	OS	FF05SP34016	NA	290.0	350.0	550.0
FF05SP3	OS	FF05SP34017	NA	375.0	440.0	1060.0
FF05SP3	OS	FF05SP34018	NA	295.0	355.0	500.0
FF05SP3	OS	FF05SP34019	NA	320.0	385.0	600.0
FF05SP3	OS	FF05SP34020	NA	270.0	330.0	450.0
FF05SP3	OS	FF05SP34021	NA	315.0	385.0	720.0
FF05SP3	OS	FF05SP34022	NA	340.0	425.0	860.0
FF05SP3	OS	FF05SP34023	NA	305.0	375.0	640.0
FF05SP3	OS	FF05SP34024	NA	325.0	390.0	720.0
FF05SP3	OS	FF05SP34025	NA	345.0	415.0	940.0
FF05SP3	OS	FF05SP34026	NA	275.0	335.0	440.0
FF05SP3	OS	FF05SP34027	NA	295.0	355.0	500.0
FF05SP3	OS	FF05SP34028	NA	305.0	370.0	590.0
FF05SP3	OS	FF05SP34029	NA	280.0	335.0	450.0
FF05SP3	OS	FF05SP34030	NA	290.0	350.0	520.0
FF05SP3	OS	FF05SP34031	NA	275.0	325.0	370.0
FF05SP3	OS	FF05SP34032	NA	245.0	305.0	350.0
FF05SP3	OS	FF05SP34033	NA	320.0	395.0	720.0
FF05SP3	OS	FF05SP34034	NA	330.0	400.0	760.0
FF05SP3	OS	FF05SP34035	NA	365.0	435.0	1060.0
FF05SP3	OS	FF05SP34036	NA	300.0	370.0	640.0
FF05SP3	OS	FF05SP34037	NA	345.0	415.0	810.0
FF05SP3	OS	FF05SP34038	NA	295.0	360.0	590.0
FF05SP3	OS	FF05SP34039	NA	285.0	350.0	550.0
FF05SP3	OS	FF05SP34040	NA	350.0	420.0	970.0
FF05SP3	OS	FF05SP34041	NA	345.0	430.0	880.0
FF05SP3	OS	FF05SP34042	NA	305.0	370.0	620.0
FF05SP3	OS	FF05SP34043	NA	315.0	385.0	800.0
FF05SP3	OS	FF05SP34044	NA	365.0	445.0	950.0
FF05SP3	OS	FF05SP34045	NA	380.0	450.0	1100.0
FF05SP3	OS	FF05SP34046	NA	330.0	410.0	770.0
FF05SP3	OS	FF05SP34047	NA	290.0	360.0	600.0
FF05SP3	OS	FF05SP34048	NA	325.0	390.0	750.0
FF05SP3	OS	FF05SP34049	NA	325.0	395.0	720.0
FF05SP3	OS	FF05SP34050	NA	295.0	355.0	460.0

s = Data qualified as suspect and not fit for use.

Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
(617) 242-6000
http://www.mwra.state.ma.us