

## Delaware Bay Oyster Stock Assessment Workshop Mortality and Disease Report for 2003

Dermo disease prevalence (the percent of infected oysters) and weighted prevalence (a measure of infection intensity) are measured on most beds during the fall random sampling seedbed stock assessment survey. The percent of oyster mortality that has occurred during the year is also estimated during this survey as the number of boxes and gapers divided by the total number of oysters plus boxes and gapers. For all three measures, the seedbeds continue to fall into the three major groupings identified since 1990: Upper (Round Island, Upper Arnolds and Arnolds), Upper Central (Upper Middle, Middle, Cohansey, Shell Rock), Central (all beds below Shell Rock). These groupings roughly correspond to salinity regimes and the locations of weak gyres over those beds.

Figure 1 shows the long-term (1990-2003) averages by bed for each parameter. The white bars at the bottom of each plot show long-term means across all beds. Mean long-term October prevalence of dermo across all beds was  $75.4\% \pm 10.5\%$ , (95% CI). Mean long-term October weighted prevalence of dermo across all beds was  $2.2 \pm 0.4$  (95% CI). Mean annual percent mortality is  $30.3\% \pm 6.5\%$  (95% CI). The patterns for each parameter are strikingly similar with all increasing from upper to lower beds. Furthermore the beds in each grouping tend to fall out together, that is, they are ranked similarly (upper beds are lightly shaded, upper central beds moderately shaded and central beds darkest). Dermo disease is a primary source of mortality on the seedbeds and the similarity among plots highlights the relationship between dermo prevalence, dermo infection intensity and mortality.

Table 1 and figures 2-4 summarize the annual changes in dermo prevalence and weighted prevalence as well as oyster mortality since 1990. In 2003, dermo prevalence remained high on average, but was slightly below the long-term mean on beds in the upper-central and central regions. The high prevalences in the central and upper central regions indicates that it will likely remain wide spread among oysters in these areas. Prevalences were much lower (27%) on the upper seedbeds. Weighted prevalence is essentially the average infection intensity of all oysters examined with intensities ranked from zero (uninfected) to five (heavily infected). Infection levels as measured by weighted prevalence were down throughout the seedbeds during 2003 compared to long-term averages. This decrease was likely a result of a colder and longer winter and a wet spring during 2002-2003. If similar conditions persist during winter and spring of 2003-2004 then infection intensities and prevalences may decline further by October 2004. As a result of the lower disease levels, mortality rates were also lower in 2003 throughout the seedbeds compared to the long-term means.

Table 1. Comparisons of 2003 dermo prevalence, dermo weighted prevalence and oyster mortality with long-term averages by seedbed region. Numbers are means  $\pm$ 95% confidence interval.

<u>Region</u>	<u>Prevalence</u>		<u>Weighted Prevalence</u>		<u>Percent Mortality</u>	
	<u>2003</u>	<u>long-term</u>	<u>2003</u>	<u>long-term</u>	<u>2003</u>	<u>long-term</u>
Upper	27 (13)	30 (13)	0.3 (0.2)	0.4 (0.3)	8 (2)	11 (3)
Upper-Central	73 (15)	74 (10)	1.1 (0.1)	1.8 (0.2)	12 (1)	19 (2)
Central-Lower	94 (4)	88 (4)	2.4 (0.6)	2.8 (0.3)	32 (7)	41 (4)
<b>All regions</b>	<b>79 (13)</b>	<b>75 (10)</b>	<b>1.8 (0.4)</b>	<b>2.2 (0.4)</b>	<b>24 (7)</b>	<b>30 (7)</b>

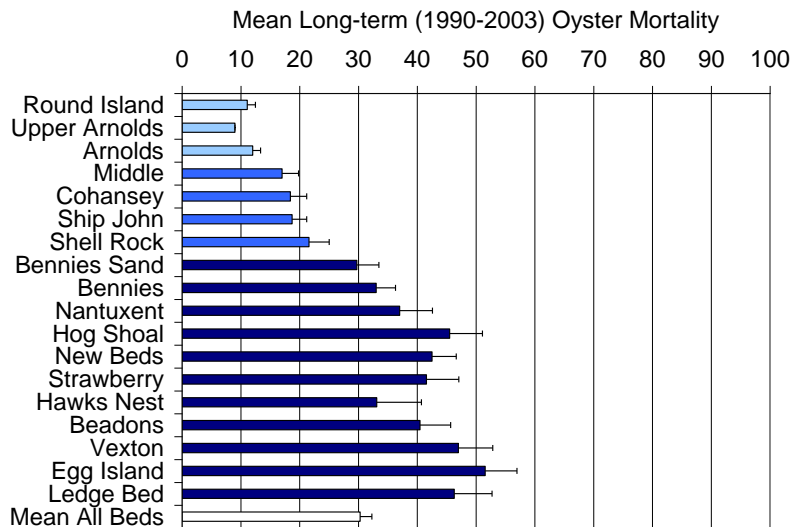
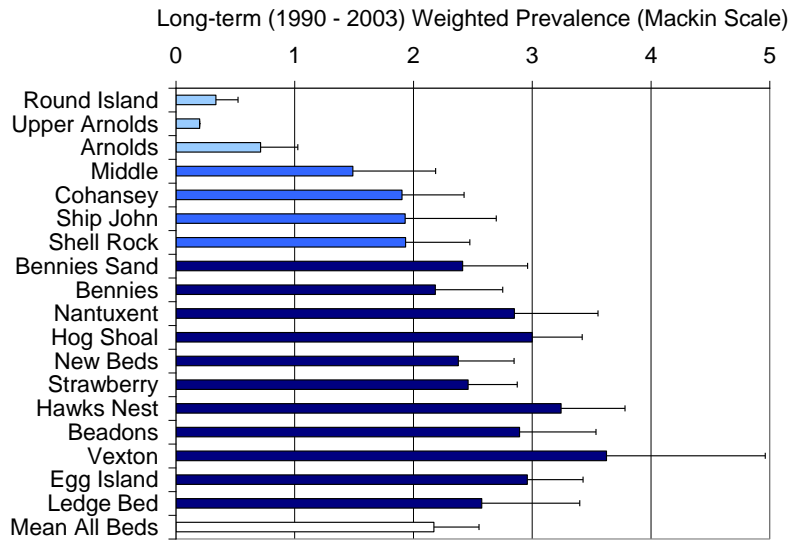
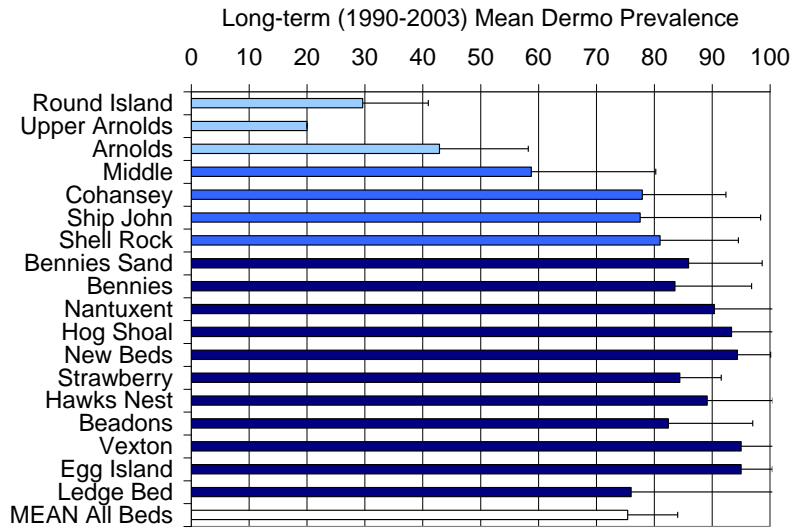


Figure 1. Long-term means by bed with 95% confidence intervals

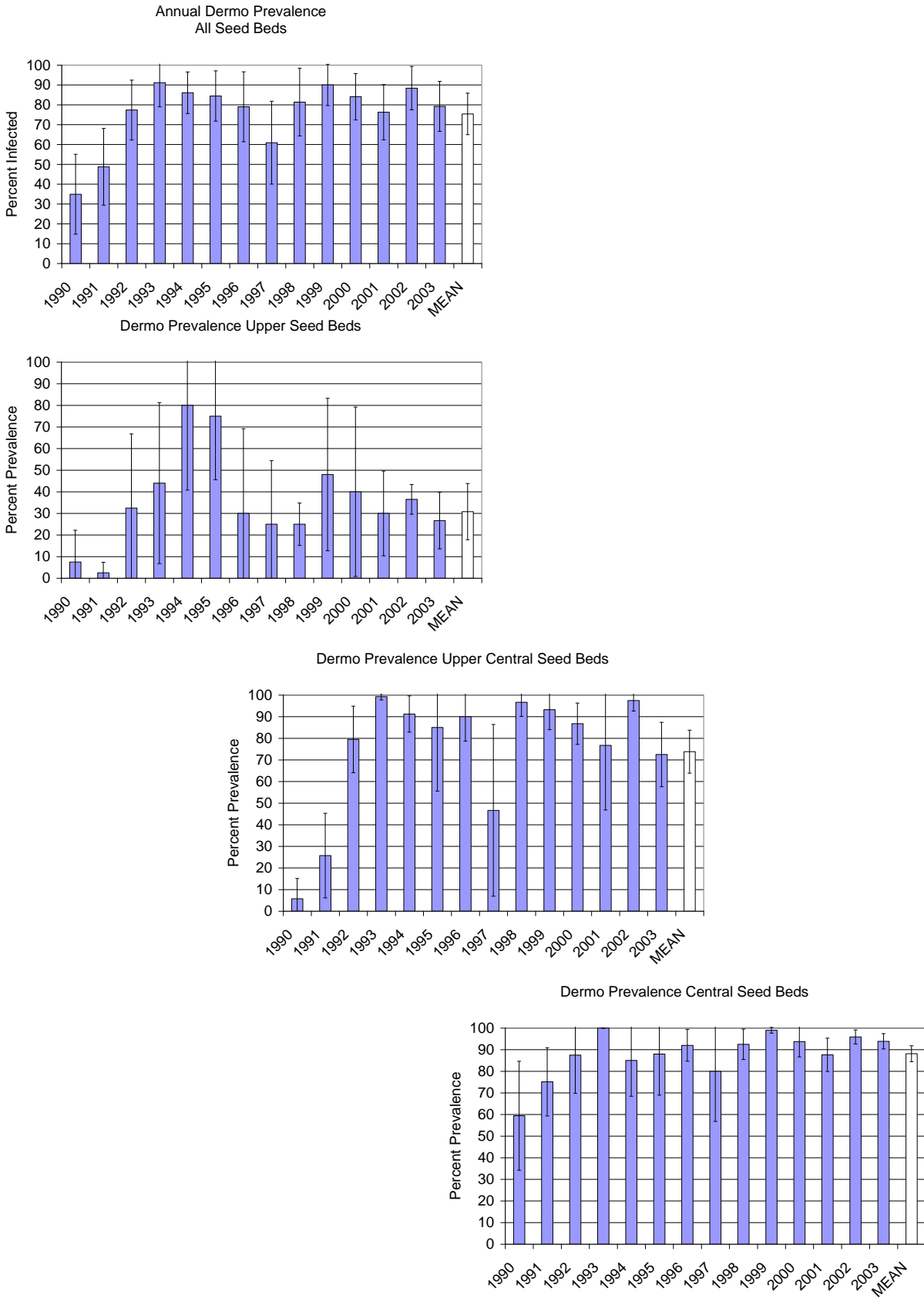


Figure 2. Annual mean dermo prevalences with 95% confidence intervals

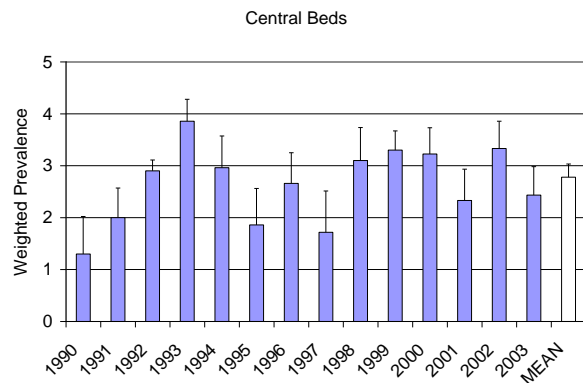
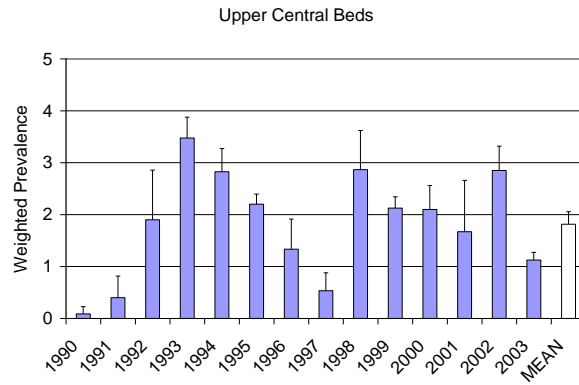
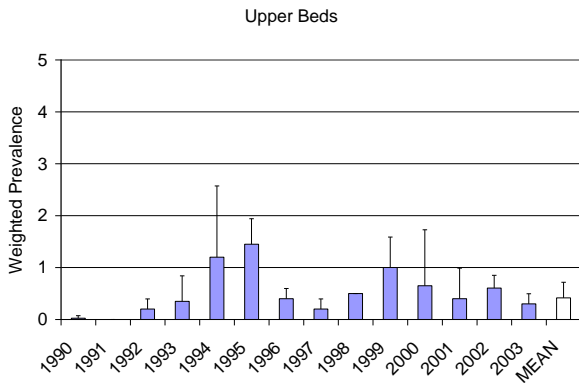
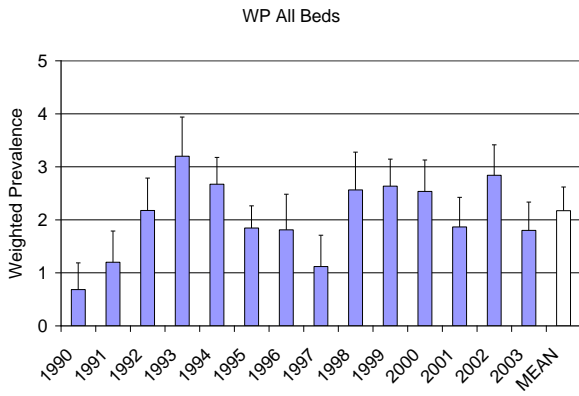


Figure 3. Annual mean dermo infection intensity (WP) with 95% CI

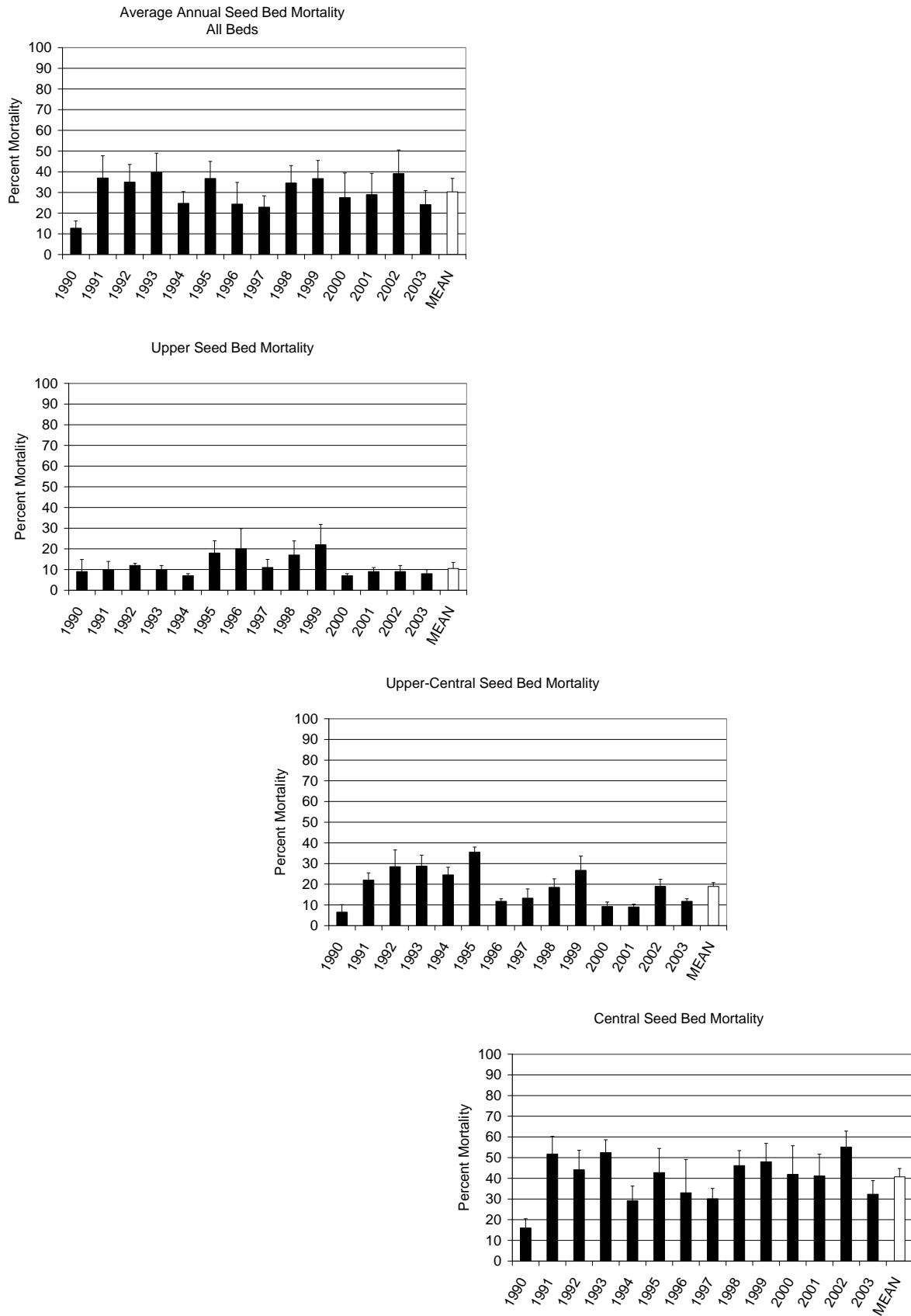


Figure 4. Annual mean mortality with 95% confidence intervals