OYSTER SIZE FREQUENCY METHODS

Virginia (P.G. Ross et al.)

Oysters are collected in quadrat samples (see density section for details). Typically, shell height (longest hinge-lip distance) of all live and "box" oysters in each sample are measured to nearest 0.1 mm. Parametric ANOVA or nonparametric Kruskal-Wallis tests are used to compare differences in mean size (with large n samples generally exhibit homogeneous variances).

On representative subtidal reef samples the ash-free dry tissue mass (g) in concert with shell height and width measurements are determined. Individuals are dried to a constant weight at 90°C and ashed at 538 °C for 5 hours to determine ash-free dry weight (AFDW). A best-fit power function is computed relating shell height to tissue AFDW. The relationship is used to estimate the AFDW of all oysters measured.

Luckenbach, M. W. and P. G. Ross, 2003. An Experimental Evaluation of the Effects of Scale on Oyster Reef Restoration: Final Report Submitted VA Sea Grant Consortium (120 pp).

Luckenbach, M. W., L. D. Coen, P. G. Ross and J. A. Stephen. In Press. Oyster Reef Habitat Restoration: Relationships between oyster abundance and community development. Journal of Coastal Research.

Luckenbach, M.W. and P.G. Ross. In Prep. Evaluating and enhancing the success of oyster reef restoration: The effects of habitat complexity on oyster survival: Final Report Submitted to VA Dept. of Environmental Quality.

South Carolina (L. Coen et al.)

The size-frequency of all live oysters in a sample (usually same sample used to determine oyster density) is determined by measuring the shell height (or length, see below) of each individual. Additional dimensions may be measured to account for the irregular SC oyster shapes (e.g., long and thin). Height measurements (±1.0 mm) are taken using a digital caliper system that enables the rapid recording of data.

For each site, multiple random samples are collected using a quadrat of appropriate size. Quadrats might range from as small as 0.10 m^2 to as large as 0.25 m^2 or larger. Intertidal natural reefs are sampled by placing a transit line parallel to the shoreline at approximately mean sea level (level of greatest oyster density). At least four quadrat

samples are then collected along a 20 m distance.

Oyster measurements typically are entered into a Microsoft Access database, proofed and exported either to Excel or PC-SAS for analysis and graphing. Differences in size-frequency distributions among sites are analyzed using JMP (SAS Institute). A 2nd degree polynomial is fit to each of the cumulative frequency distributions by running AFit Y by X@ analysis where Y = the cumulative frequency and X = shell height. Line parameters (intercept, slope and curvature) are saved in a new JMP data file and later analyzed. Normality and homogeneity of residuals for line parameters are examined using the ADistribution of Y@ and the AFit Y by X@ options. A Two-Way ANOVA is run from the JMP AFit Model@ option to examine among site differences for each line parameter.

Coen, L.D., M. Bolton-Warberg, Y. Bobo, D. Richardson, A.H. Ringwood, and G.I. Scott, 2004. Oyster Beds, pp. 127-147. In: R.F. Van Dolah, D.M. Sanger, and A.B. Filipowicz, eds. A Baseline Assessment of Environmental and Biological Conditions in the May River, Beaufort County, South Carolina: Final Report Submitted to the Town of Bluffton (226 pp.).

Van Dolah, R.F., A.F. Holland, L.D. Coen, A.H. Ringwood, M.V. Levisen, P.P. Maier, G.I. Scott, A.K. Leight, Y. Bobo, D. Richardson, 1999. Biological Resources, Report on the status of Broad Creek/Okatee River Systems. DHEC-MRRI-NOAA-Charleston.