

Appendix B

Discussion of statistics presented with pebble-fabric diagrams

Each stereogram is accompanied by the number of pebble orientations measured and values for mean lineation azimuth, mean lineation plunge, and first, second and third eigenvalues calculated by the STEREO™ program (RockWare, 1992). The eigenvalues are normalized between 1 and 0 and are presented in decreasing order. Three extreme types of distributions are possible:

The first eigenvalue is much greater than the other two (more than 10 times in the pebble fabrics measured in the study area). This is a unimodal cluster. An example is fabric A, section St8

The first and second eigenvalues are roughly the same but significantly (3 or more times in study area tills) larger than the third eigenvalue. These fabrics form a girdle distribution. Fabric B, Section W2 is an example.

All eigenvalues are approximately the same value. This characterizes a uniform distribution. None were found among tills in the study area.

Fabrics determined on tills of the study area fall between types 1 and 2 and include spread unimodal, bimodal clusters, spread bimodal multimodal, and girdle (Hicock et al., 1996) with The values of LN (normal log) (E_1/E_2), LN (E_2/E_3), and [$\ln(E_1/E_2)$] / [$\ln(E_2/E_3)$] correspond to r_1 , r_2 and K , respectively that are used to quantify the fabric types 1 to 3 discussed above (Davis, 1986).

The two other values, spherical variance and $R_{\bar{R}}$ are useful in quantifying fabric strength (dispersion of vectors around the mean direction):

$$R = (\sum l^2) + (\sum m^2) + (\sum n^2)^{1/2}$$

where l , m , n are the direction cosine values for the x (north), y (east) and z (vertical) axes of pebble orientations and $R_{\bar{R}}$ is the normalized value for R :

$$R_{\bar{R}} = R/n$$

where n = the number of measured pebble orientations. Spherical variance (sv) ranges between 0 and 1 and is related to R :

$$sv = (n - R)/n$$

so that the greater dispersion of vectors about the mean, the larger the sv . $R_{\bar{R}}$ can be used to test the hypothesis that a data set represents a uniform distribution (case 3 above). The confidence value statistic that accompanies the fabric diagrams gives the confidence value at which the uniformity hypothesis is rejected (after the table of Davis (1986)).