APPLICATION NOTE NO. 13-3   **Revised March 2001**

SBE DISSOLVED OXYGEN SENSOR CALIBRATION NOTE
(new value for the "PCOR" coefficient)

Note: This Application Note does not apply to the SBE 43 Dissolved Oxygen Sensor.

Based on the observations of our customers and analyses of oxygen data, Sea-Bird recommends a new value for the coefficient "**pcor**" used in the calibration equation for polarographic oxygen sensors (Application note 13-1):

pcor = 0.00015, with units of [inverse decibars].

This value should be used in the SEASOFT calibration equation unless a better value can be determined by pressure calibrations of individual sensors against titrated oxygen values. We estimate a residual error in the pressure correction term of less than 0.2 ml/l per 1000 decibars using the new pcor value.

SEASOFT uses the Owens and Millard (JPO 1985) algorithm as a calibration equation. The algorithm incorporates a term for pressure dependence of oxygen permeability of the Teflon membrane:

oxygen concentration = (terms) * exp [**pcor** * P]

where exp is the natural exponential function and P is pressure measured in decibars.
Sources for estimates of the value of pcor are:

Source	pcor value
Beckman 1971, MINOS DOM dissolved oxygen sensor operating and maintenance instructions	0.00024
Beckman, Dissolved oxygen monitor polarographic oxygen sensor, Technical Memorandum ATO-1019A	0.00017
Owens and Millard (1985, J.Physical Oceanog., v15 (5))	0.0001438 (typical)
Owens and Millard (preprint of JPO 1985), numerical fits of data from 144 profiles of oxygen data	0.000156 (average)
Sea-Bird analysis of oxygen data supplied by customers	0.00014 to 0.00016