

Ice Draft Calculations

Sea level η is derived from the relationship

$$\eta = \left(\frac{P_{\text{btm}} - P_{\text{atm}}}{\rho g} \right) - \Delta D$$

Where

P_{btm} is bottom pressure at instrument depth,

P_{atm} is atmospheric pressure,

ρ is the density of sea water,

g is the local acceleration due to gravity,

ΔD is the vertical spacing between the pressure sensor and the range (acoustic transducer) sensor.

Ice draft (d) is computed as

$$d = \eta - \beta \cdot r \cdot \cos\theta$$

Where

β is the calibration factor for sound speed *

r is range

θ is the tilt angle

* calibration factor for the actual mean sound speed relative to the initially assumed sound speed used in decoding the raw range data.

Reference: R. Birch, D. Fissel, H. Melling, K. Vaudrey, K. Schaudt, J. Heideman and W. Lamb, 2000. Ice-profiling Sonar: Upward Looking Sonar Provides Over-Winter Records of Ice Thickness and Ice Keel Depths off Sakhalin, Russia (Sea Technology Magazine August 2000) Permission to reproduce granted by Compass Publications, Inc. This article appeared in the August 2000 issue of Sea Technology magazine, pp. 48-53.

