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WHAT IS PSU?

After receiving the latest issue of *Oceanography*, I was irritated by the Sea-Bird advertisement on the inside cover. It shows a TS diagram that is labeled with the term PSU. Although I have been unsuccessful in getting the company to discontinue the use of this term, I thought I should write this letter to express my concerns about its use by oceanographers in published articles. The term apparently is used to denote the use of the Practical Salinity *Scale* and is an abbreviation for Practical Salinity *Unit*.

As a member of the Joint Panel on oceanographic Tables and Standards that was instrumental in the development of the international equation of state of sea water and the practical salinity *scale*, I am amazed at the practice that seems to have been adopted by oceanographers in using PSU. The practical salinity *scale* was defined as conductivity ratio with no units. A seawater sample with a conductivity ratio of 1.0 at 15°C with a KCl solution containing a mass of 32.4356 g in a total mass of 1 kg of solution has a salinity of 35.000 (no units or ‰ are needed). The salinity and temperature dependence of this ratio for seawater weight evaporated or diluted with water led to the full definition of the practical salinity *scale*. This definition was adopted by all the National and International Oceanographic Organizations. It also was published in all the journals publishing oceanographic studies.

Somewhere along the line oceanographers started to use the term PSU (practical salinity unit) to indicate that the practical salinity *scale* was used to determine conductivity salinity. This apparently resulted from the previous use of ‰ to represent parts per thousand, which some oceanographers felt was a *unit*. The bottom line is that salinity has always been a ratio and does not have physical units. The use of the term PSU should not be permitted in the field and certainly not used in published papers. Whenever the practical salinity scale is used to determine salinity this should be stated somewhere in the paper. The use of the term PSS can be used to indicate that the Practical Salinity *Scale* is used. One certainly does not have to use the term PSU on all the figures showing TS data. I should also point out that UNESCO (1985) has published a SUN report that carefully outlines the use of units in the field of oceanography. This report was also adopted by all the International Oceanographic Societies but is not generally used by oceanographers and the journals publishing oceanographic data. If the field of oceanography is to become a recognized science, it must adopt the units that are basic to the fields of chemistry and physics. It also should not adopt new units for variables that are unitless.

UNESCO (1985) The international system of units (SI) in oceanography, UNESCO Technical Papers No. 45, IAPSO Pub. Sci. No. 32, Paris, France.

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