Glossary

Argo is a global array of temperature and salinity profiling floats that began in 2000. The goal stated on the Argo web pages (http://www.argo.ucsd.edu/) is to achieve "an array of 3000 floats [that] will provide 100,000 temperature/salinity (T/S) profiles and velocity measurements per year distributed over the global oceans at an average 3-degree spacing. Floats will cycle to 2000 m depth very 10 days, with 4–5 year lifetimes for individual instruments. All Argo data are publicly available in near real-time via the Global Data Assembly Centers".

Biomass "Biomass is defined as the amount of living material, but for practical and theoretical reasons, units have not been rigidly prescribed. Instead, 'biomass' has become a catch-all term with the operational definition, 'the amount of biological material that is of interest to the researcher.' The word is convenient and unlikely to be abandoned, but its meaning, at least within the field of planktonic ecology, is nebulous almost to the point of uselessness. Thus, any discussion of biomass should include a specific definition and should have a justification of the choice." (a direct quote from Cullen [124]).

CalCOFI station point interval = 4 nautical miles or 7.4 km (1 n. mi = 1.852 km). Therefore the distance between offshore station 100 and station 110 is 40 n. mi, between inshore 50 and 55 is 20 n. mi, and between nearshore station 28 and 30 is 8 n. mi.

Spacing between the transect lines and the distance between standard stations is (10 points) 40 n. mi or 74 km. Nearshore stations are half or less this spacing and the offshore stations are sometimes double this distance.

Core CalCOFI lines from south to north are lines 93.3, 90, 86.7, 83.3, 80, and 76.7. CalCOFI line 90 lies along 240° True off Dana Point, CA, and is the best studied line. Station 120 is 683 km offshore. Station 100 is 535 km offshore (see Fig. 1.4).

Ekman pumping is vertical motion in the water column caused by horizontal variations in surface wind stress. Ekman pumping can be expressed in terms of the change in sea surface elevation $\frac{dh}{dt} = -\frac{1}{\rho f} curl \overrightarrow{\tau}$, where $\overrightarrow{\tau}$ is the vector of the wind stress, ρ is density, f is the Coriolis parameter, h is sea-surface elevation and t is time ([107] attributed to [442]).

Production is a measure of concentration of biomass with units of Mass Volume^{-1}or Mass Area^{-1}.

Productivity is a rate with units of Mass Volume^{-1}Time^{-1} or Mass Area^{-1}Time^{-1}. Production and productivity differ in the time dimension and the terms are not equivalent. Productivity is a rate that can be used to express turnover. Production is not a rate.

The Southern California Bight (SCB) is the region from Point Conception to Ensenada, Mexico inshore of the Santa Rosa Ridge. CalCOFI stations with numbers 45 and lower lie within the SCB. CalCOFI stations with numbers 53 and higher lie to the west of the bathymetric ridge and so are outside the SCB.

Spiciness is a state variable $\pi_{(\theta,s)}$ that is most sensitive to isopycnal (i.e. constant density) thermohaline variations, and least sensitive to the density field. Its diapycnal gradient is related to the density gradient ratio, so it is sensitive to interleaving and double-diffusive mixing between overlying water masses of different density. It is conserved with respect to isentropic motion, meaning that it remains constant along surfaces of potential temperature (θ). $\pi_{(\theta,s)}$ is useful both for characterizing water masses and to indicate double-diffusive stability [168]. Spiciness is larger for warm, salty water.

Steric height maps or dynamic topography reflect the geostrophic flow at one surface relative to another. The steepness of the slope in dynamic topography is proportional to current speed and the distance between dynamic topography contours is inversely proportional to current speed. Tightly spaced contours reflect faster current speeds. Flows are along the contours with higher topography to the right in the Northern Hemisphere, and to the left in the Southern Hemisphere. The contrast between highs and lows in the oceanic gyres is on the order of 0.5–1.0 dynamic meters [546].

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Wind stress (τ) is the horizontal force of the wind on the surface of the water, or the vertical transfer of horizontal momentum. Surface wind stress is related to wind velocity by the "bulk formula":

$$(\tau_{wind_x}, \tau_{wind_y}) = \rho_{air} C_D u_{10}(u_a, v_a)$$

where $(\tau_{wind_x}, \tau_{wind_y})$ are the zonal and meridional components of stress, $C_D$is a bulk transfer coefficient for momentum (dimensionless), ρ_{air} is the density of air at the surface (kg m^{-3}) and $u_{10}(u_a, v_a)$ is the speed of the wind (m s^{-1}) at a height of 10 m in the *x* and *y* directions [362]. This equation is also written [534]:

$\tau = \rho_a C_D U_{10}^2$ where U_{10} is wind speed at 10 m. Units for τ are kg $m^{-1}s^{-2}$ or Pa.

Wind mixing (u^{*^3}) is wind speed (m s^{-1}) cubed with units of $m^3 s^{-3}$ and is the rate at which turbulent energy is supplied to the ocean by the wind. This is related to the rate of mixing at the base of the mixed layer and the consequent transfer of nutrients across the pycnocline into the euphotic zone.

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