Descriptive Physical Oceanography: An Introduction (Sixth Edition)
Talley, Pickard, Emery and Swift
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Corrections
As of September 26, 2015

Chapter 1:
Figure 1.2: "Tsunamis" should be placed on the graph with frequency range 1min-20 hours, rather than the higher frequency range.

Chapter 3:
Section 3.4 (p. 36): "Advances in electrical circuits and sensor systems permitted accurate compensation for temperature, making conductivity-based salinity measurements feasible (see supplemental materials in Chapter S16, Section S16.4.3 on the textbook Web site)."

Section 3.5.5 (pp. 43-44) To standardize definitions of thermal expansion and haline contraction:

"As described above, the equation of state (3.6) is somewhat nonlinear in temperature, salinity and pressure. That is, the equation of state (EOS 80) includes products of salinity, temperature and pressure. Sometimes, for practical purposes, in theoretical and simple numerical models the equation of state is approximated as linear and its pressure dependence is ignored:

$$\rho \approx \rho_0 - \alpha\rho\,(T-T_0) + \beta\rho\,(S-S_0); \qquad (3.9)$$
$$\alpha = -(1/\rho)\,\partial\rho/\partial T \text{ and } \beta = (1/\rho)\,\partial\rho/\partial S$$

where ρ_0, T_0 and S_0 are arbitrary constant values of ρ, T and S; they are usually chosen as the mean values for the region being modeled. Here α is the *thermal expansion coefficient*, which expresses the change in density for a given change in temperature (and should not be confused with specific volume, defined with the same symbol in section 3.5.3) and β is the *haline contraction coefficient*, also called the *saline contraction coefficient*, which is the change in density for a given change in salinity. The terms α and β are nonlinear functions of salinity, temperature and pressure; their mean values are chosen for linear models. Full tables of values are given in UNESCO (1987). The value of α (at the sea surface and at a salinity of 35 g kg^{-1}) ranges from 53 x 10^{-6} K^{-1} at a temperature of 0°C to 257 x 10^{-6} K^{-1} at a temperature of 20°C. The value of β (at the sea surface and at a salinity of 35 g kg^{-1}) ranges from 785 x 10^{-6} kg g^{-1} (at a temperature of 0°C) to 744 x 10^{-6} kg g^{-1} (at a temperature of 20°C)."

Figure 3.7 caption edit. "For a station in the Pacific Ocean …" (delete "Papa")

Chapter 4:
Figure 4.17a: edited to remove title and page number from original scan.

“FIGURE 4.24 (a) Chlorofluorocarbon content (CFC-11; pmol/kg) and (b) $D^{14}C$ (/mille) in the Pacific Ocean at150°W. Dark cyan (gray) areas in (a) indicate undetectable CFC-11. From the WOCE Pacific Ocean Atlas. *Source: From Talley (2007).*”

Chapter 5:

“FIGURE 5.17 Sverdrup transport (Sv), where negative is clockwise and positive is counterclockwise circulation. Wind stress data are from the NCEP reanalysis 1968-1996. (Kalnay et al., 1996). The wind stress and wind stress curl used in this Sverdrup transport calculation are shown in the online supplement, Figure S5.10.”

Section 5.4.3 (p. 124): “Direct measurements of the energy arriving at the sea surface are made with a pyranometer (see Section S16.8 located on the textbook Web site), but it is not practical to do this over large areas, or for prediction.”

Section 5.4.4.1 (p. 128): “It is difficult to directly measure Q_b over large areas, although it can be measured locally with a radiometer (see the description in Chapter S16, Section S16.8 located on the textbook Web site).”

Section 5.4 clarification: The net air-sea heat flux Q is given by Eqs. 5.8 and 5.9. The signs of the individual terms in Eqs. 5.10 through 5.17 are not provided in a manner that is consistent with Eqs. 5.8 and 5.9. The shortwave radiation (5.10) is positive for heat gain by the ocean. The longwave radiation (5.11) is positive for heat loss from the ocean. The latent heat loss (5.13) is positive for heat loss from the ocean. The sensible heat loss (5.17) is positive for heat loss from the ocean. The maps of air-sea heat flux (Figs. 5.11, 5.12, and supplementary figures), positive heat flux means the ocean is gaining heat. For these definitions and for the maps then, Equation (5.8) should be written as:

$$Q_T = Q_s - Q_b - Q_h - Q_e + Q_v \qquad (5.8)$$

and similarly for Equation (5.9):

$$Q_s - Q_b - Q_h - Q_e = Q_{sfc} \qquad (5.9)$$

Table 5.2: Header should read “Some Values for the Sensible Heat Transfer Coefficient at 10 m, $10^3 C_h$, as a Function of $(T_s – T_a)$ and Wind Speed *u*”

Chapter 7

Corrected caption (in print chapter, and also color plates and online powerpoint):

“FIGURE 7.8 Ekman response. Average wind vectors (red/black) and average ageostrophic current at 15 m depth (blue/gray). The current is calculated from 7 years of surface drifters drogued at 15 m, with the geostrophic current based on average density data from Levitus et al. (1994a) removed. (No arrows were plotted within 5 degrees of the equator because the Coriolis force is small there.) This figure can also be found in the color insert. ©American Meteorological Society. Reprinted with permission. *Source: From Ralph and Niiler (1999).”*

Equation (7.27a) in Section 7.6.2 is missing the ' for ρ in the integrand:

$$h' = - (1/\rho_o) \int \rho' \, dz \qquad (7.27a)$$

Section 7.8.3 references Munk (1950), which is missing in the DPO reference list.
Munk, Walter H., (1950). On the wind-driven ocean. *J. Meteor.*, **7**, 80–93.

Chapter S7 (supplement)

"FIGURE S7.30 (a) Rossby deformation radius (km) for the first baroclinic mode (Chelton et al., 1998). (b) Shortest period (in days) for the first baroclinic mode, based on the deformation radius in (a). Note that the annual cycle, at 365 days, occurs around latitudes 40° to 45°; poleward of this, all such waves are slower (Wunsch, 2010)."

Wunsch, Carl, 2010: Toward a Midlatitude Ocean Frequency–Wavenumber Spectral Density and Trend Determination. *J. Phys. Oceanogr.*, **40**, 2264–2281.

Chapter 8

First paragraph should read: "This chapter continues the dynamical discussion of Chapter 7, starting with an overview of the properties of waves (Section 8.2), and moving to surface and internal gravity waves and tides (Sections 8.3 to 8.6)." The second sentence should be deleted, as there is no expanded version.

Section 8.6.2, pp. 240-241: "The spring and neap tides are illustrated in Figure 8.13 using a two-month record at La Jolla."

Chapter 9

Figure 9.1b: arrow indicating circulation direction around Zapiola Rise is incorrect, should be counterclockwise (anticyclonic).

Chapter 10

Corrected caption

"FIGURE 10.29 Potential T-S curves for selected stations (inset map). Acronyms: NPCW, North Pacific Central Water; SPCW, South Pacific Central Water; NPSTUW, North Pacific Subtropical Under- water; SPSTUW, South Pacific Subtropical Underwater; NPSTMW, North Pacific Subtropical Mode Water; SPSTMW, South Pacific Subtropical Mode Water; NPIW, North Pacific Intermediate Water; AAIW, Antarctic Intermediate Water; DtW, Dichothermal Water; MtW, Mesothermal Water; CCS, California Current System waters; and PCCS, Peru-Chile Current System Waters. This figure can also be found in the color insert."
[Delete second to last sentence in original caption.]

Chapter 11

Figure 11.1b. The current labeled "Northwest Monsoon C. (NEC)" should read "Northeast Monsoon C. (NEC)"

Click here for link to corrected figure.

Chapter S12:
Figure S12.4. Figure panel included extra text.
Click here for link to corrected figure.

Chapter 13:
p. 449 (section 13.3.2): SPZ and SZ are reversed. See Table 13.1 and Figure 13.4 for correct locations. Correct text is: "The SZ lies between the SACCF and SB. Within the SZ, the low oxygen UCDW upwells to the surface and is converted to very cold ASW.

The SPZ lies between the SB and the Antarctic Shelf Front."

Chapter 14:
Figure 14.2. Panel (a) and (b) captions are reversed. Correct caption:
"FIGURE 14.2 (a) Surface velocity streamlines, including both geostrophic and Ekman components; color is the mean speed in cm/sec, and (b) surface dynamic topography (dyn cm), with 10 cm contour intervals. This figure can also be found in the color insert. *Source: From Maximenko et al. (2009).*"

Equation 14.1a, b: correction so that sign of W is positive upwards.

$$M_{Ti} = V_{Ni} - V_{Si} + W_i - W_{i-1} = 0$$

$$W_i = - V_{Ni} + V_{Si} + W_{i-1} \qquad (14.1a, b, c)$$

$$w_i = W_i/A_i$$

Chapter S14:
Figure S14.8. Incorrect figure from Davis (2005).
Click here for link to corrected figure.

Chapter S15:
Figure S15.9. Panel (a) and (b) captions are reversed. Correct caption:
"FIGURE S15.9. Indian Ocean Dipole mode. (a) IOD index (blue: difference in SST anomaly between the western and eastern tropical Indian Ocean), plotted with the anomaly of zonal equatorial wind (red) and the Nino3 index from the Pacific (black line). (b) Anomalies of SST (shading) and wind velocity (arrows) during a composite positive IOD event. These are accompanied by higher precipitation in the warm SST region and lower precipitation in the cool SST region. *Source: From Saji et al., (1999).*"

Typos:
Chapter S15, p. 25, para. 2 line 2, extra space before comma

References (missing)

Munk, Walter H., (1950). On the wind-driven ocean. *J. Meteor.*, **7**, 80–93.