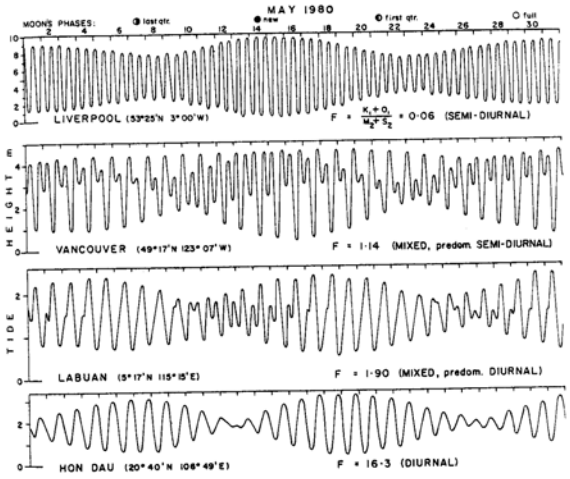
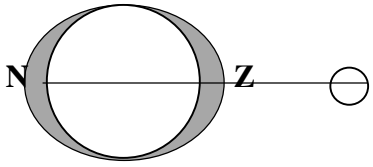
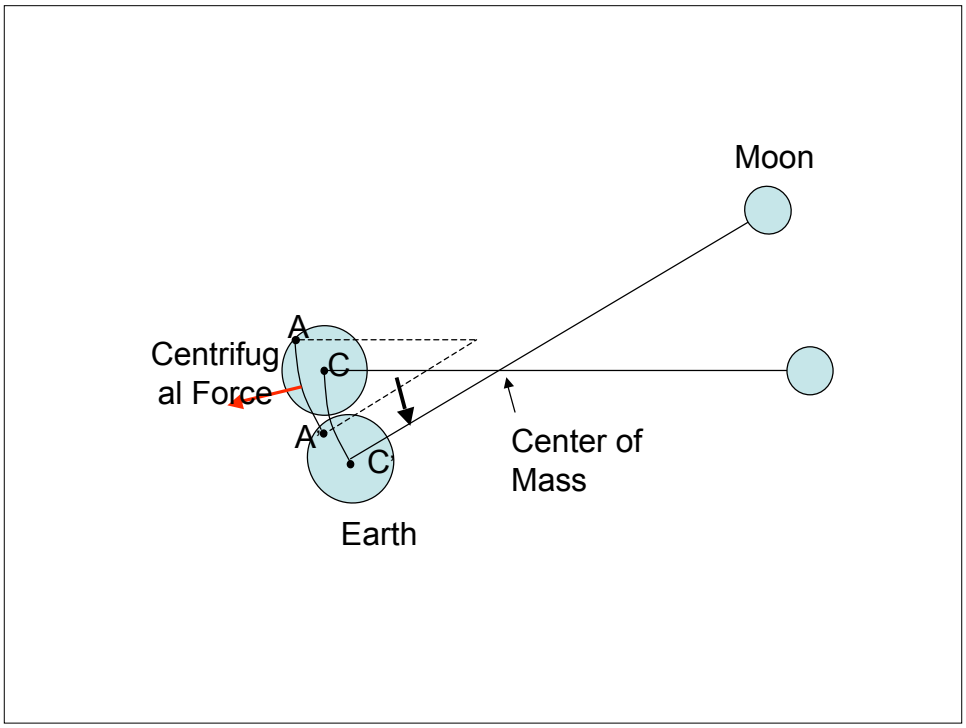
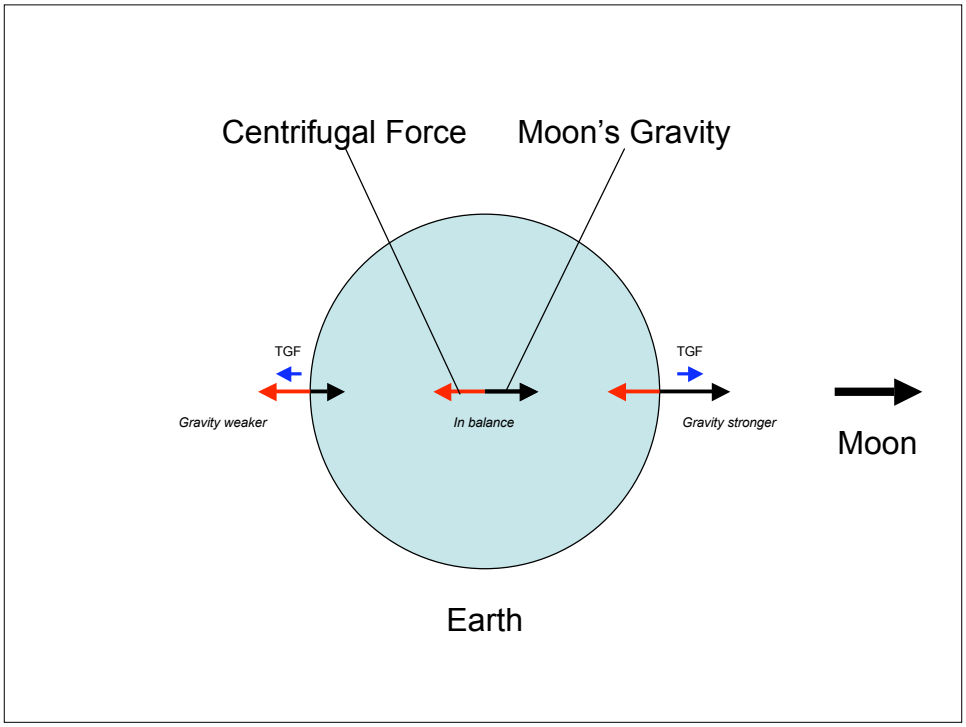


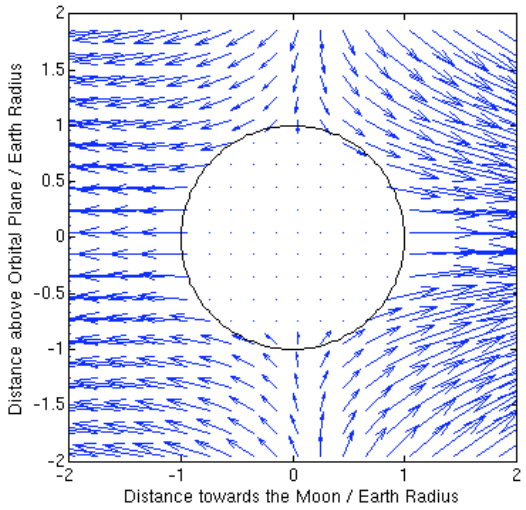

FIG. 13.1 *Tide curves for May 1980 (data from Admiralty Tide Tables) showing four types in terms of the "form ratio" $F = (K_1 + O_1)/(M_2 + S_2)$ of major diurnal to semi-diurnal constituents.*

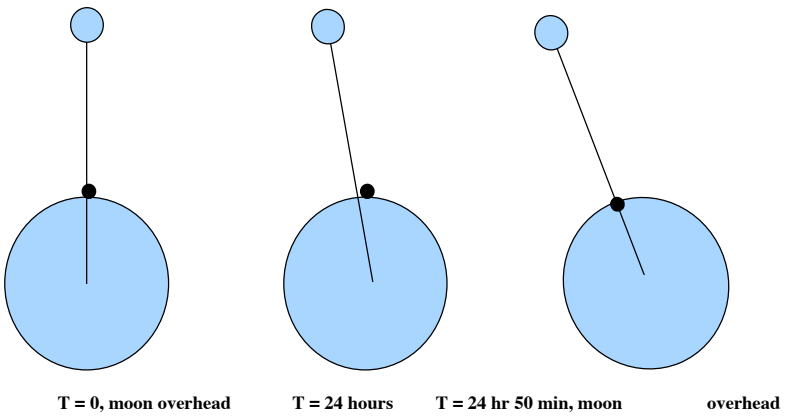
253

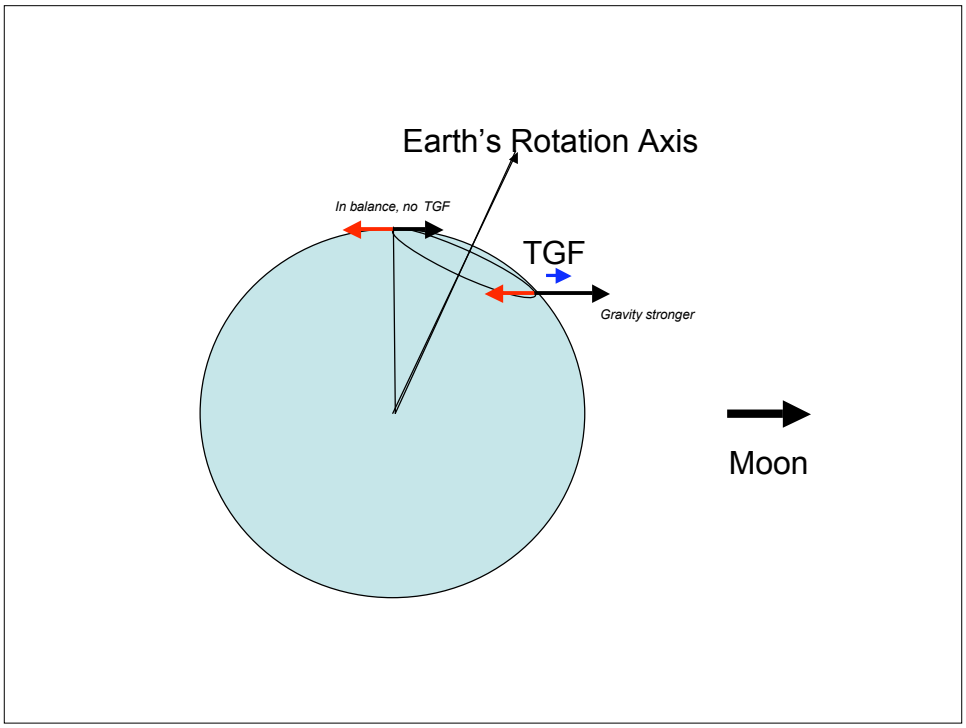


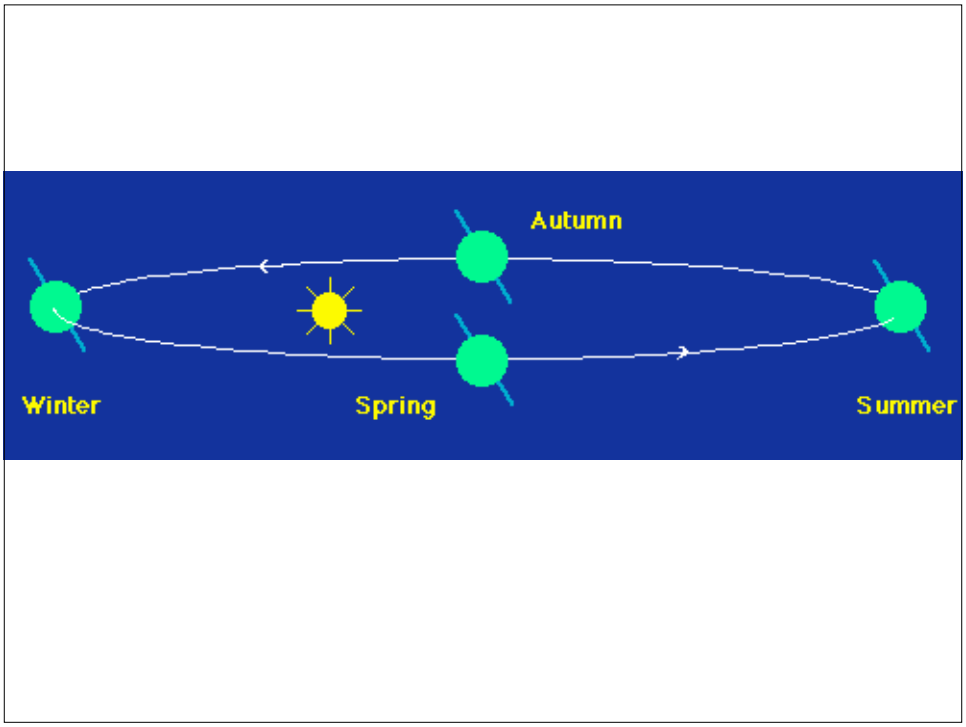

Moon
A
Centrifug
al Force
C
A
C
Center of
Mass
Earth

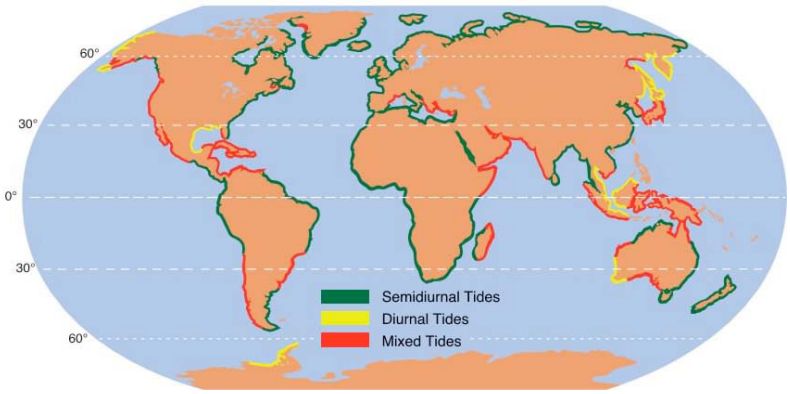

Centrifugal Force
Moon's Gravity
TGF
TGF
Gravity weaker
In balance
Gravity stronger
Moon
Earth

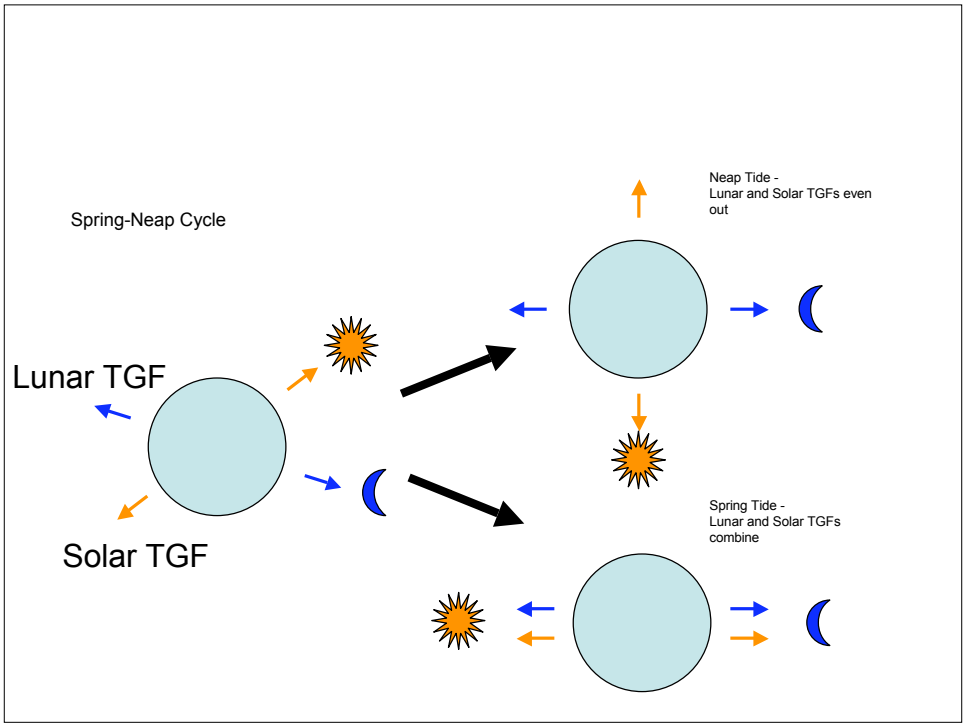

Distance above Orbital Plane / Earth Radius
Distance towards the Moon / Earth Radius
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2

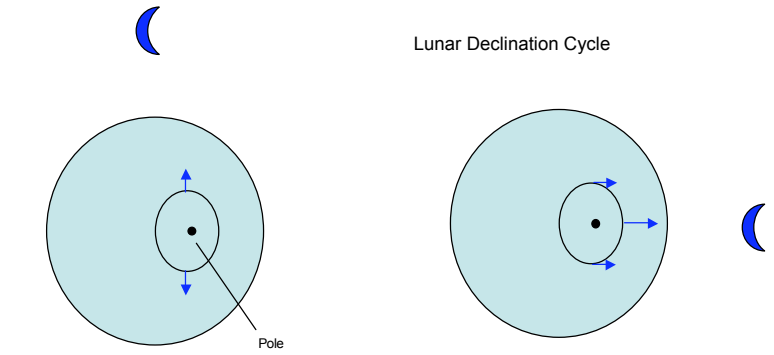

T = 0, moon overhead
T = 24 hours
T = 24 hr 50 min, moon overhead


Earth's Rotation Axis
In balance, no TGF
TGF
Gravity stronger
Moon


Autumn
Winter
Spring
Summer


60°
30°
0°
30°
60°
Semidiurnal Tides
Diurnal Tides
Mixed Tides


Spring-Neap Cycle
Neap Tide -
Lunar and Solar TGFs even
out
Lunar TGF
Solar TGF
Spring Tide -
Lunar and Solar TGFs
combine




Rotation axis oriented 90° to the moon - minimum diurnal tide

Rotation axis oriented to the moon - maximum diurnal tide

*Viewed from above the orbital plane*

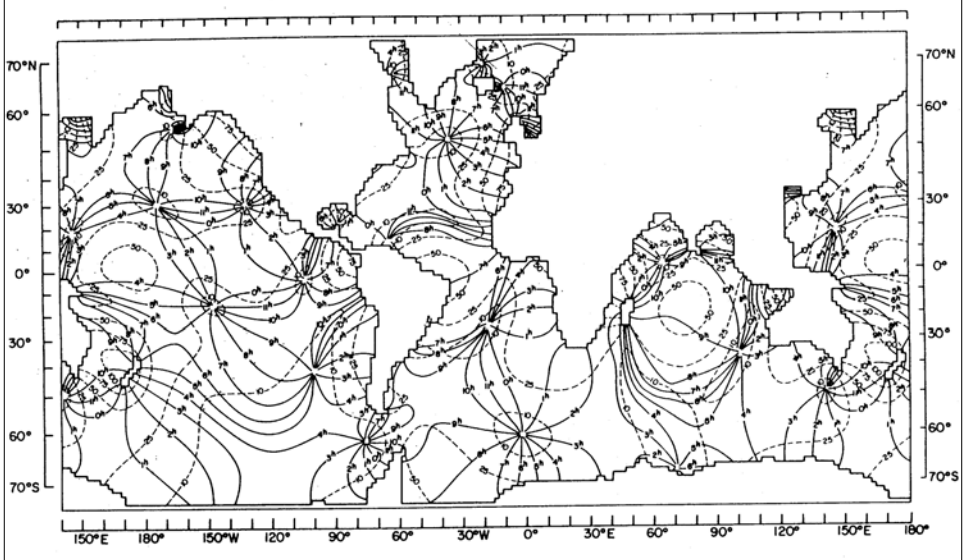



FIG. 13.8 *Global $M_2$ tide calculated from tidal potential including effects of self-attraction and of tidal loading, 2° grid. Full lines = cophase lines (Greenwich hours), dashed lines = corange lines (cm). (From Accad and Pekeris, 1978.)*

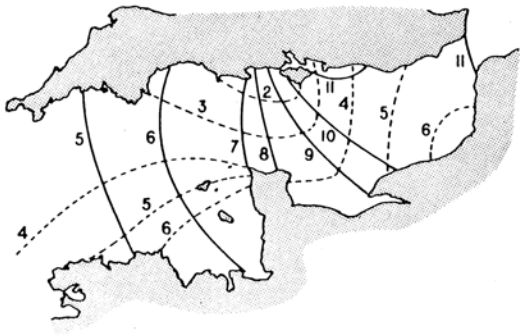
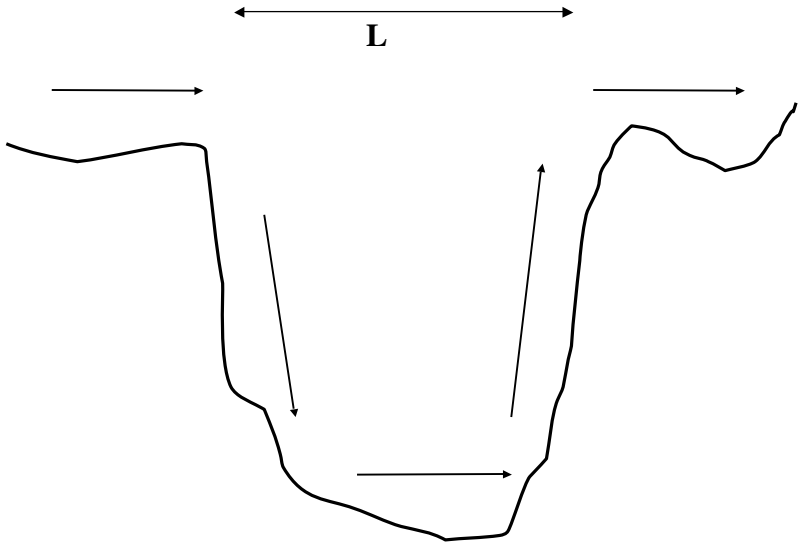
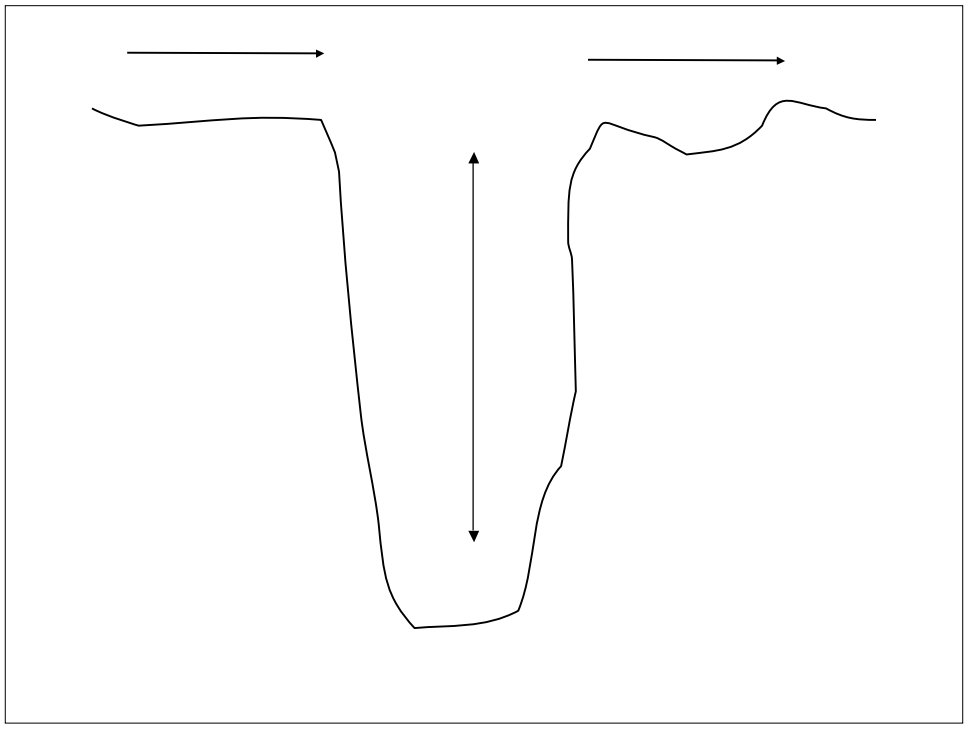
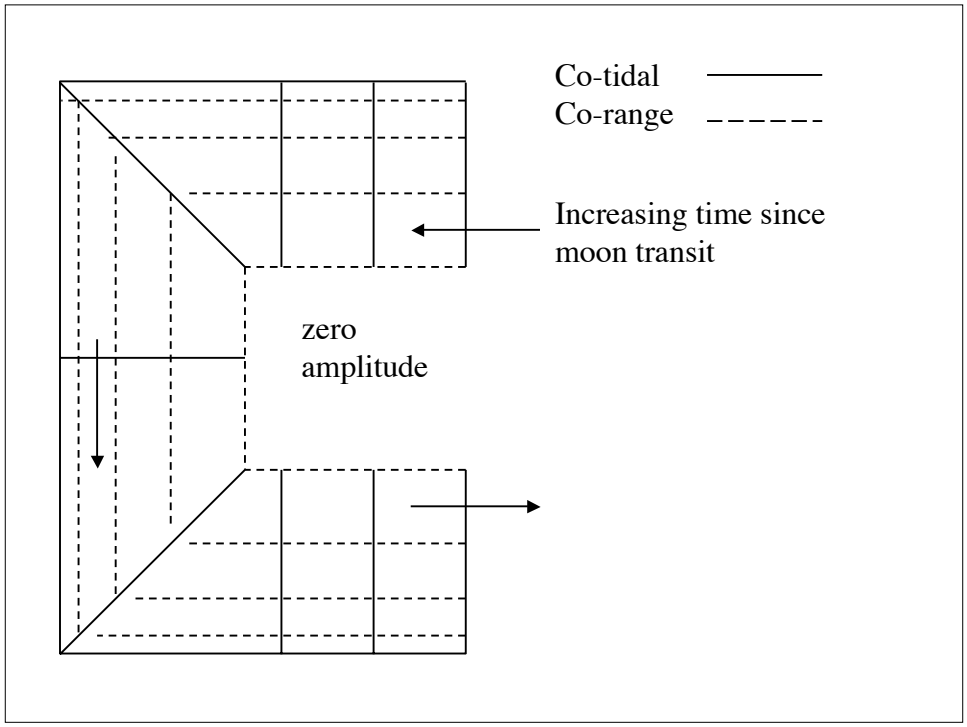
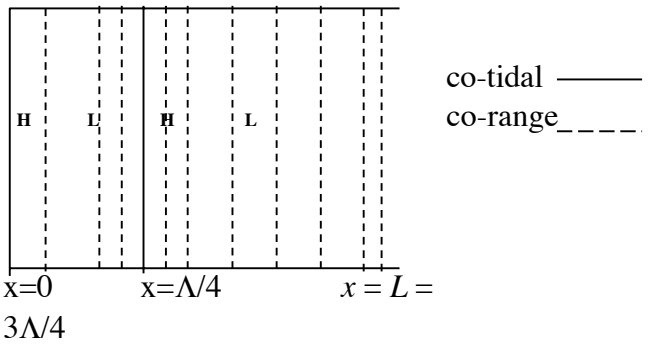



**Fig. 10.5.** Co-tidal lines (solid) with time in lunar hours, and co-range lines (dotted with values in meters) for the English Channel. [From Proudman (1953, p. 262); after Doodson and Corkan (1931).]






Co-tidal
Co-range
Increasing time since
moon transit
zero
amplitude



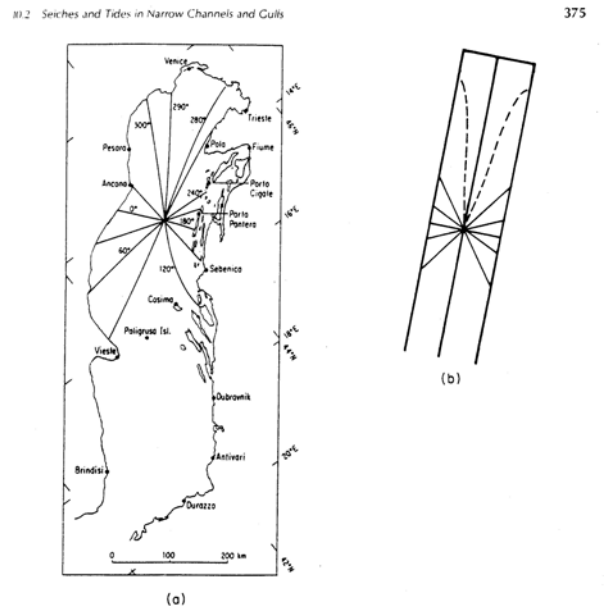




**Fig. 10.1.** (a) Co-tidal lines for the northern Adriatic. [After Polli (1960); from Hendershott and Speranza (1971, Fig. 7).] (b) Co-tidal lines for a simple model with depth increasing quadratically with distance from the end. The phase difference between the solid lines is 30°. The phase on the broken lines differs by 10° from that on the axis.

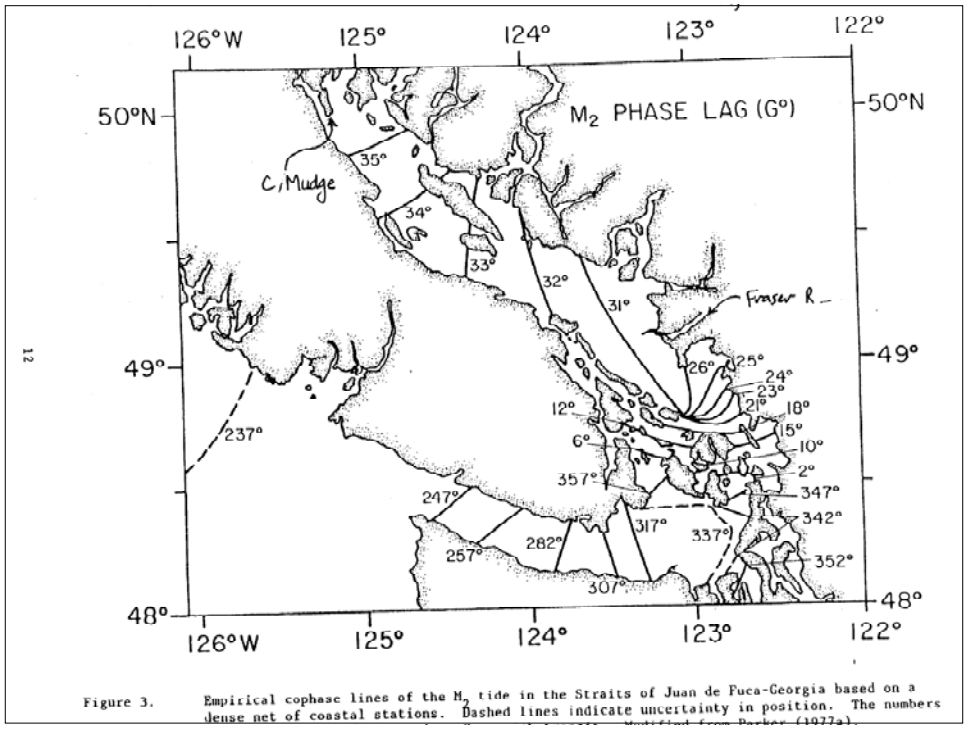



Figure 3. Empirical cophase lines of the $M_2$ tide in the Straits of Juan de Fuca-Georgia based on a dense net of coastal stations. Dashed lines indicate uncertainty in position. The numbers

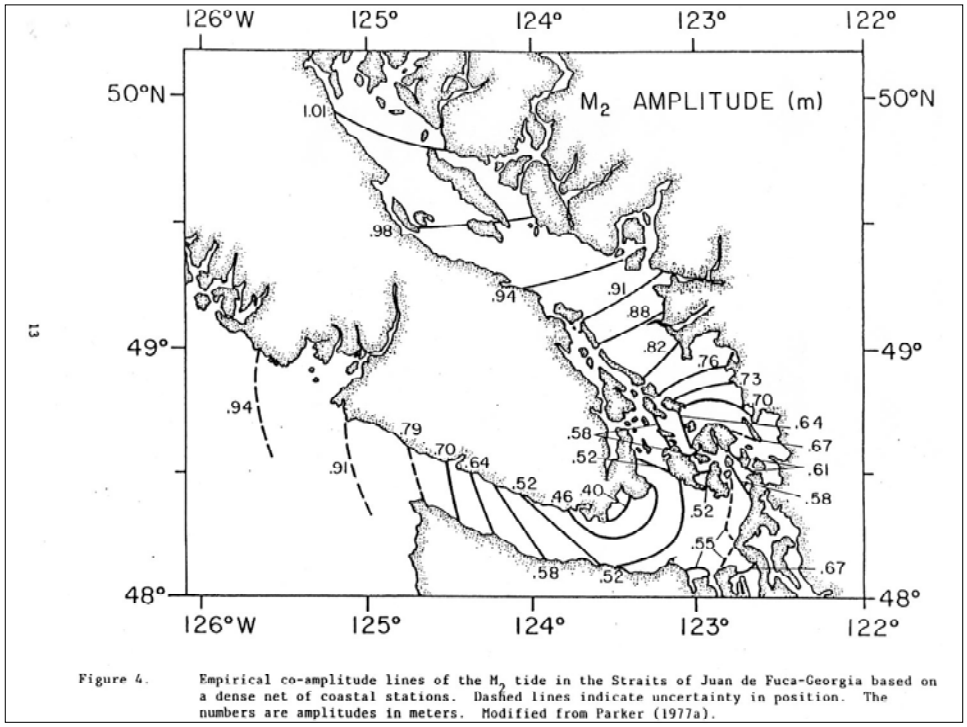
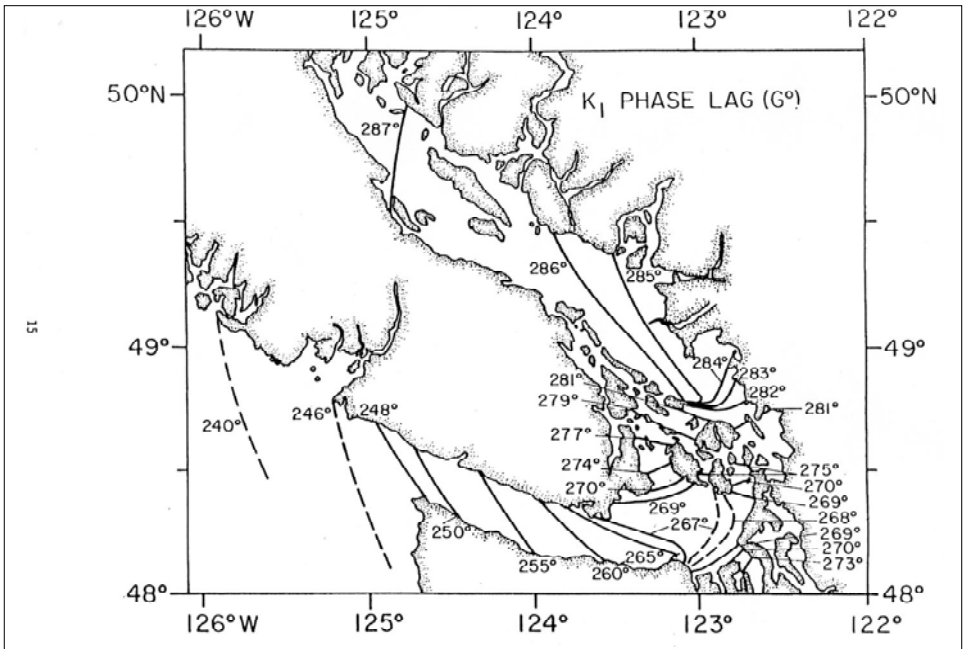
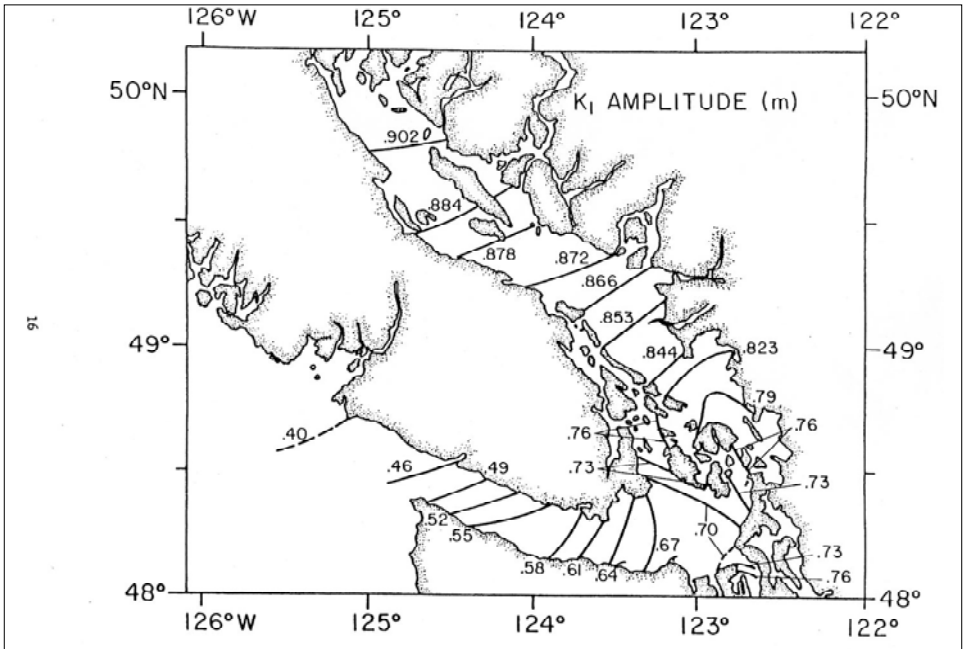



Figure 4. Empirical co-amplitude lines of the $M_2$ tide in the Straits of Juan de Fuca-Georgia based on a dense net of coastal stations. Dashed lines indicate uncertainty in position. The numbers are amplitudes in meters. Modified from Parker (1977a).




15

Figure 5. Empirical cophase lines of the $K_1$ tide in the Straits of Juan de Fuca-Georgia based on a dense net of coastal stations. Dashed lines indicate uncertainty in position. The numbers are phase lags in degrees since Greenwich transit. Modified from Parker (1977a).




16

Figure 6. Empirical co-amplitude lines of the $K_1$ tide in the Straits of Juan de Fuca-Georgia based on a dense net of coastal stations. Dashed lines indicate uncertainty in position. The numbers are amplitudes in meters. Modified from Parker (1977a).

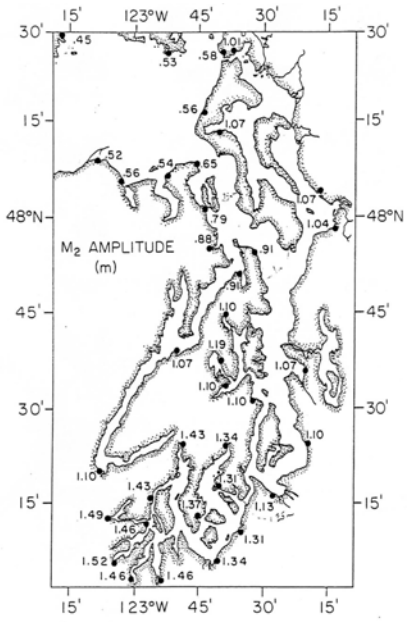



Figure 8. Distribution in Puget Sound of $M_2$ amplitude in meters. Sources same as Figure 7.

18

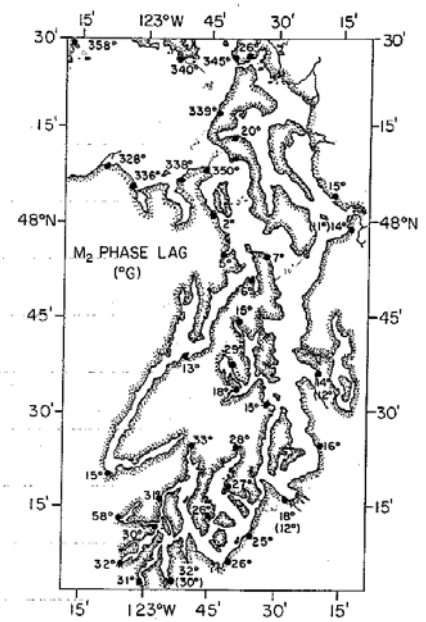



Figure 7. Distribution in Puget Sound of $M_2$ phase lag in degrees relative to Greenwich transit. From harmonic analyses by the United States Coast and Geodetic Survey and the National Survey (obtained from various sources).

17

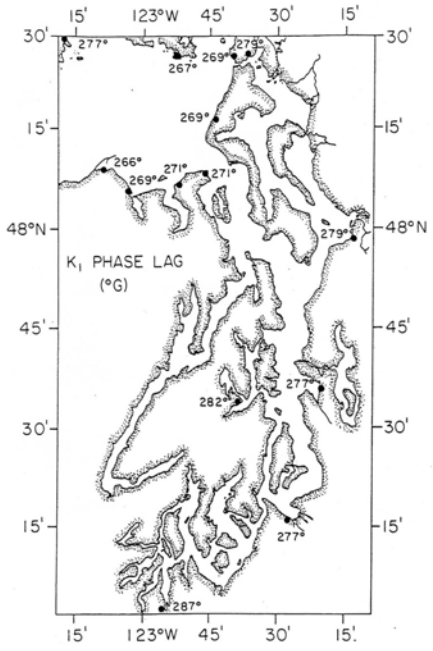



Figure 9. Distribution in Puget Sound of $K_1$ phase lag in degrees relative to Greenwich transit. Sources same as Figure 7.

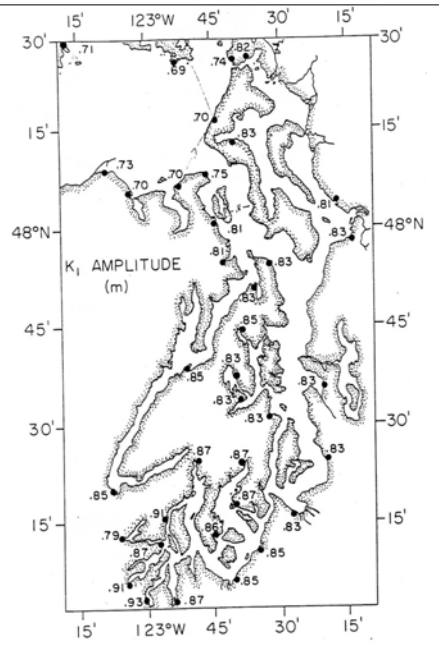



Figure 10. Distribution in Puget Sound of $K_1$ amplitude in meters. Sources same as Figure 7.

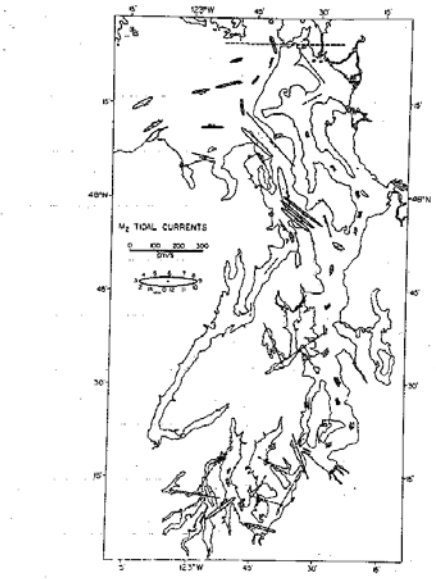


Figure 13. Near-surface $M_2$ tidal current ellipses observed in Puget Sound. Descriptions of symbols same as Fig. 12. The ellipses were obtained from several sources: 29-day analyses (Table 4) of observations by Cannon et al. (1979), ellipses supplied by Parker (private communication) obtained from a recent observation program by the National Ocean Survey, ellipses from Parker (1977a) and estimates (dashed lines) from the National Ocean Survey Tide Table (1977).



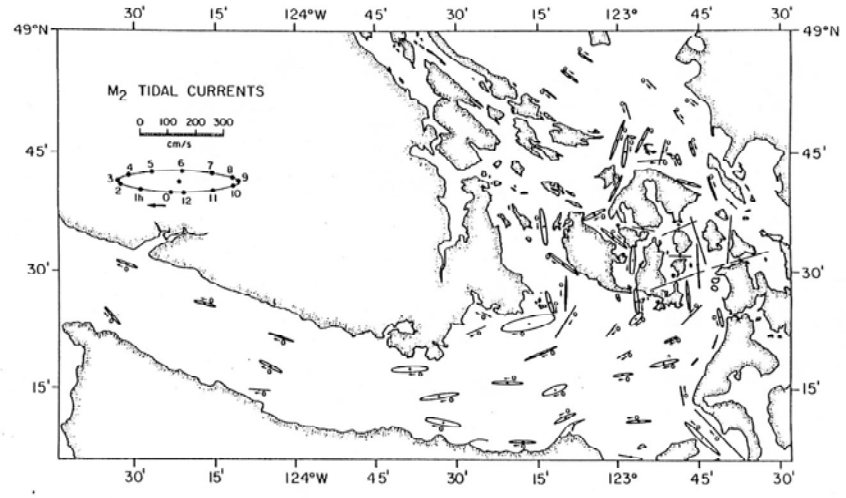
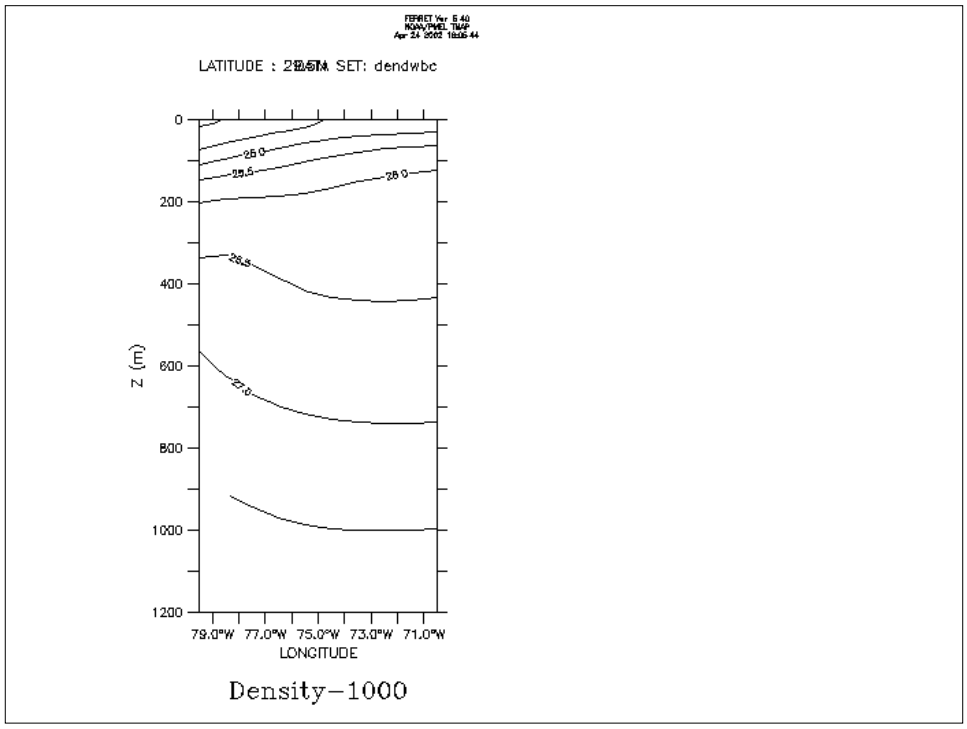





Figure 12. Near-surface $M_2$ tidal current ellipses observed in the Strait of Juan de Fuca and the southern Strait of Georgia. The $M_2$ current velocity is a vector extending from the center of a given ellipse to the ellipse itself. The position at Greenwich transit of the velocity vector is indicated by the zero. As time progresses the tip of the vector travels around the ellipse in the direction shown by the arrow. The ellipses were obtained by harmonic analyses of 15- or 29-day series of observations. After Parker (1977a).


FERRET Ver. 5.40
NOAA/PMEL TMAP
Apr 24 2002 18:05:44
LATITUDE : 22.5N SET: dendwbc
0
200
400
600
800
1000
1200
Z (m)
25.0
25.5
26.0
26.5
27.0
79.0°W 77.0°W 75.0°W 73.0°W 71.0°W
LONGITUDE
Density−1000