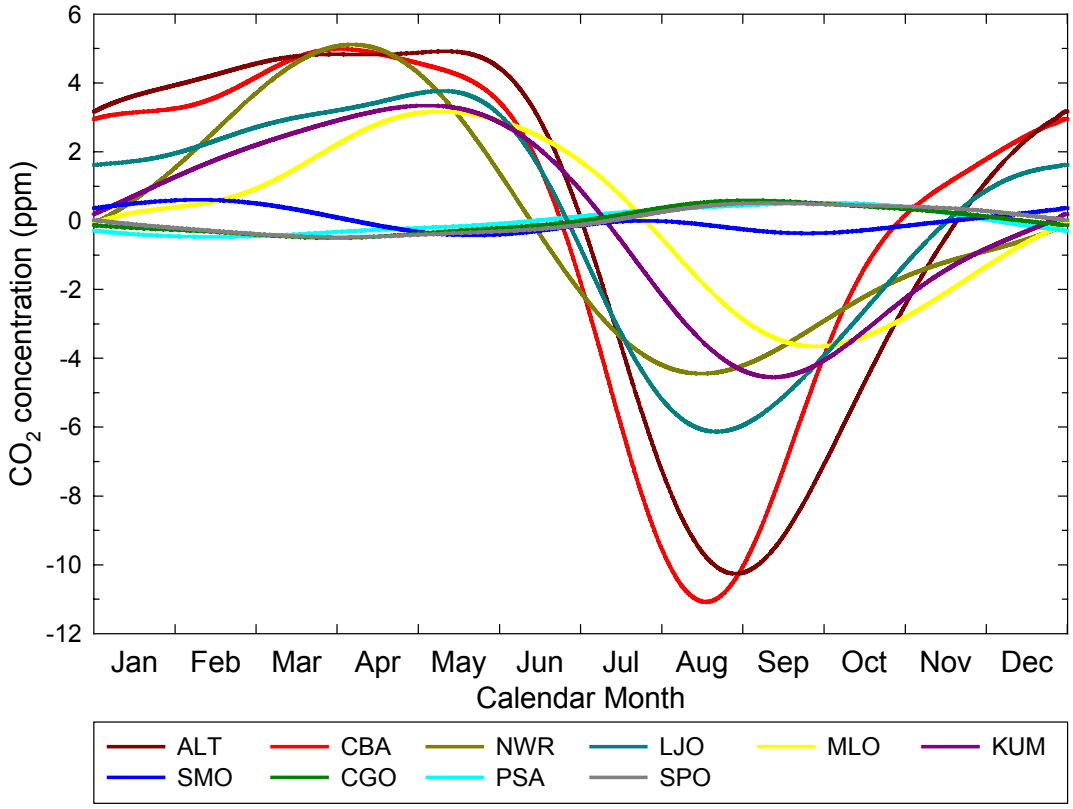

Figure 2.7. Shows the seasonal cycle component of the curve fits from Figure 2.3 for CO_2 concentration for all stations, after correcting data as described in Section 2.2.3.

expected by a high northern latitude station. The same reason given for Cold Bay exhibiting the largest amplitude, the proximity to sources and sinks, can also explain the significantly earlier spring rise and fall decrease in O_2/N_2 ratios. The Cold Bay APO signal shows greater asymmetry compared to other stations, particularly noticeable in the spring. This I attribute to the marine and land biota being slightly out of phase in this region in terms of the start of the spring thaw.

The seasonal APO cycles at Niwot Ridge and Mauna Loa are the smallest observed because both of these sites are situated at elevations that place them above the

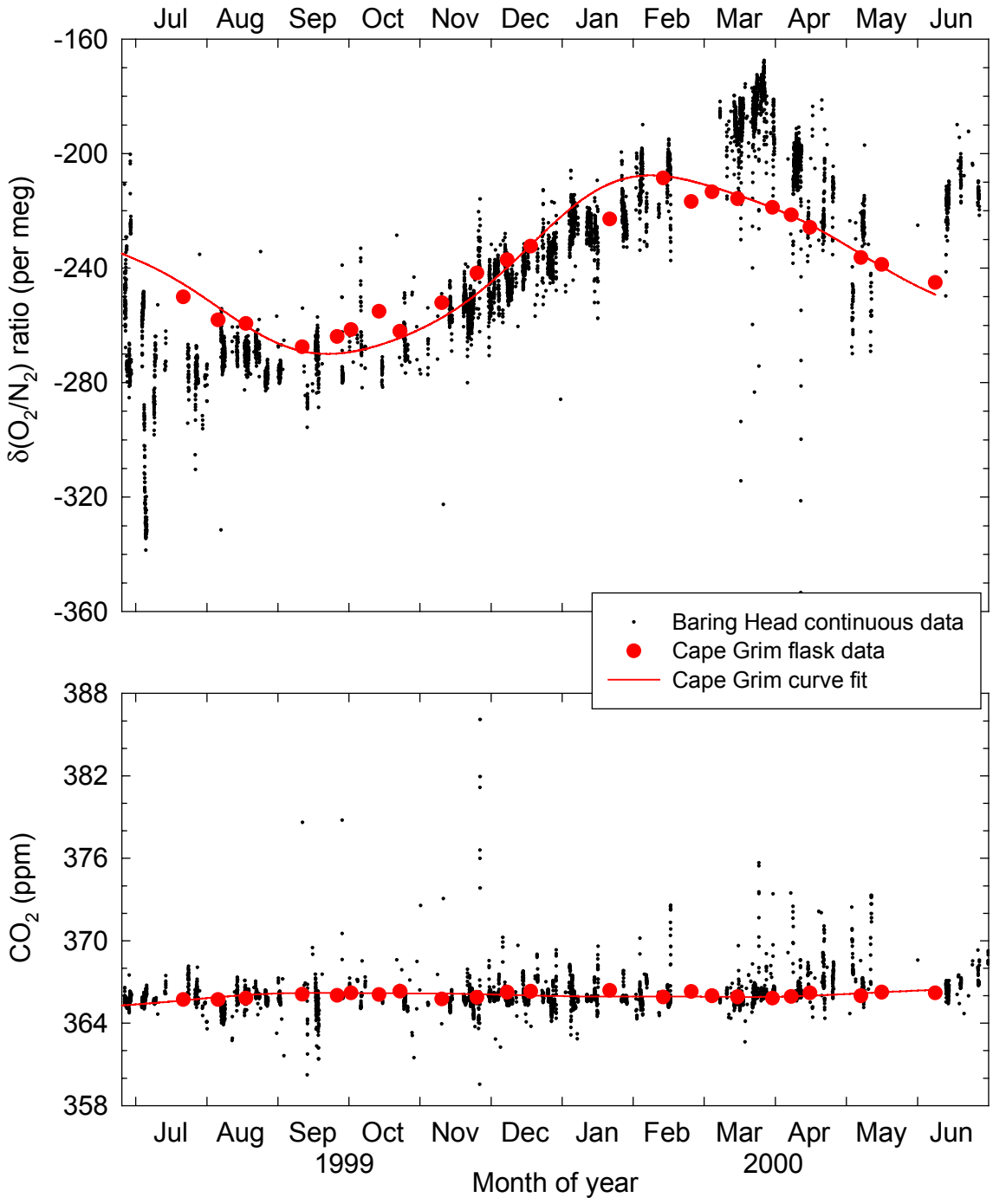

Figure 4.11. As for Figure 4.9, except data have now been filtered to only show data when conditions are thought to be representative of clean, background air. That is, the wind direction is between 135° and 225°, and the wind speed is greater than 20 km/h.

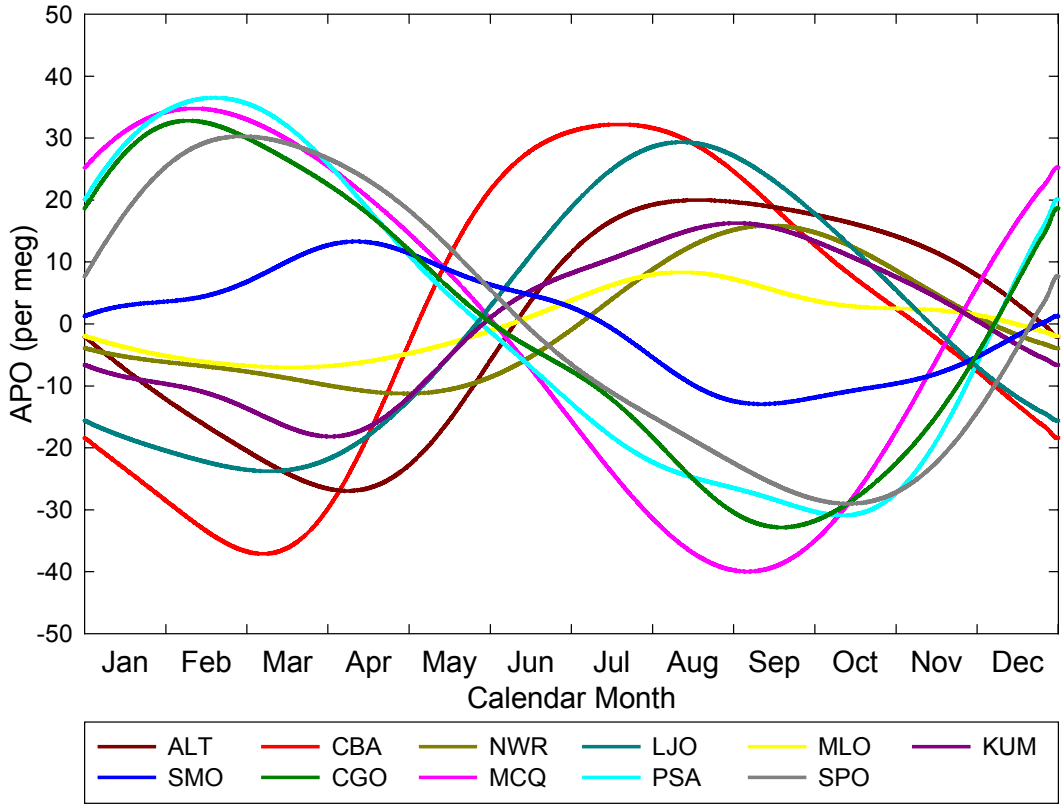

Figure 2.8. Shows the seasonal cycle component of the curve fits from Figure 2.4 for APO for all stations, after correcting data as described in Section 2.2.3.

marine boundary layer, and the surface-based ocean fluxes driving the seasonal cycles are attenuated at these altitudes. South Pole is also at higher elevation and shows some attenuation in APO compared to other mid- to high latitude southern hemisphere stations. The reason why South Pole does not exhibit the same attenuation as observed at Mauna Loa and Niwot Ridge is probably because it is surrounded by regions of active air-sea gas exchange.

The smallest seasonal cycles are observed in the tropical stations of Mauna Loa, Cape Kumukahi, and Samoa, as expected due to the low seasonality in these locations.

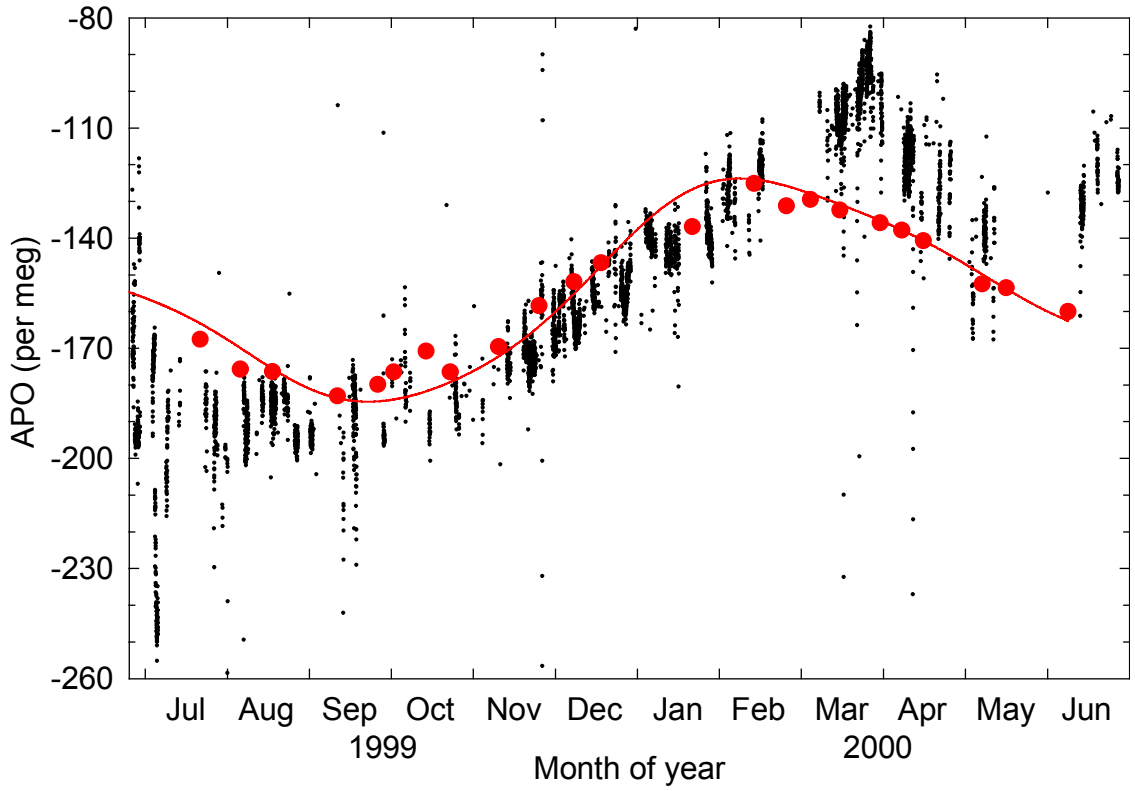

Figure 4.12. As for Figure 4.10, except data have now been filtered to only show data when conditions are thought to be representative of clean, background air, as in Figure 4.11. That is, the wind direction is between 135° and 225° and the wind speed is greater than 20 km/h.

Baring Head CO_2 data now show reasonably good agreement with Cape Grim for the one year record. O_2/N_2 ratio and APO data still show the same prominent differences observed in Figures 4.9a and 4.10. Ignoring for the moment data in June 2000, the March, April, and May 2000 data appear to indicate a later summertime O_2/N_2 (and APO) peak at Baring Head than Cape Grim and a subsequent faster drawdown of O_2/N_2 (and APO) in autumn. In addition, at the beginning of the record, in June and July 1999, there is tentative evidence for an earlier wintertime minimum in O_2/N_2 ratio