Variations and distributions of pCO_2^{sw} in the western North Pacific during 1990 to 2003

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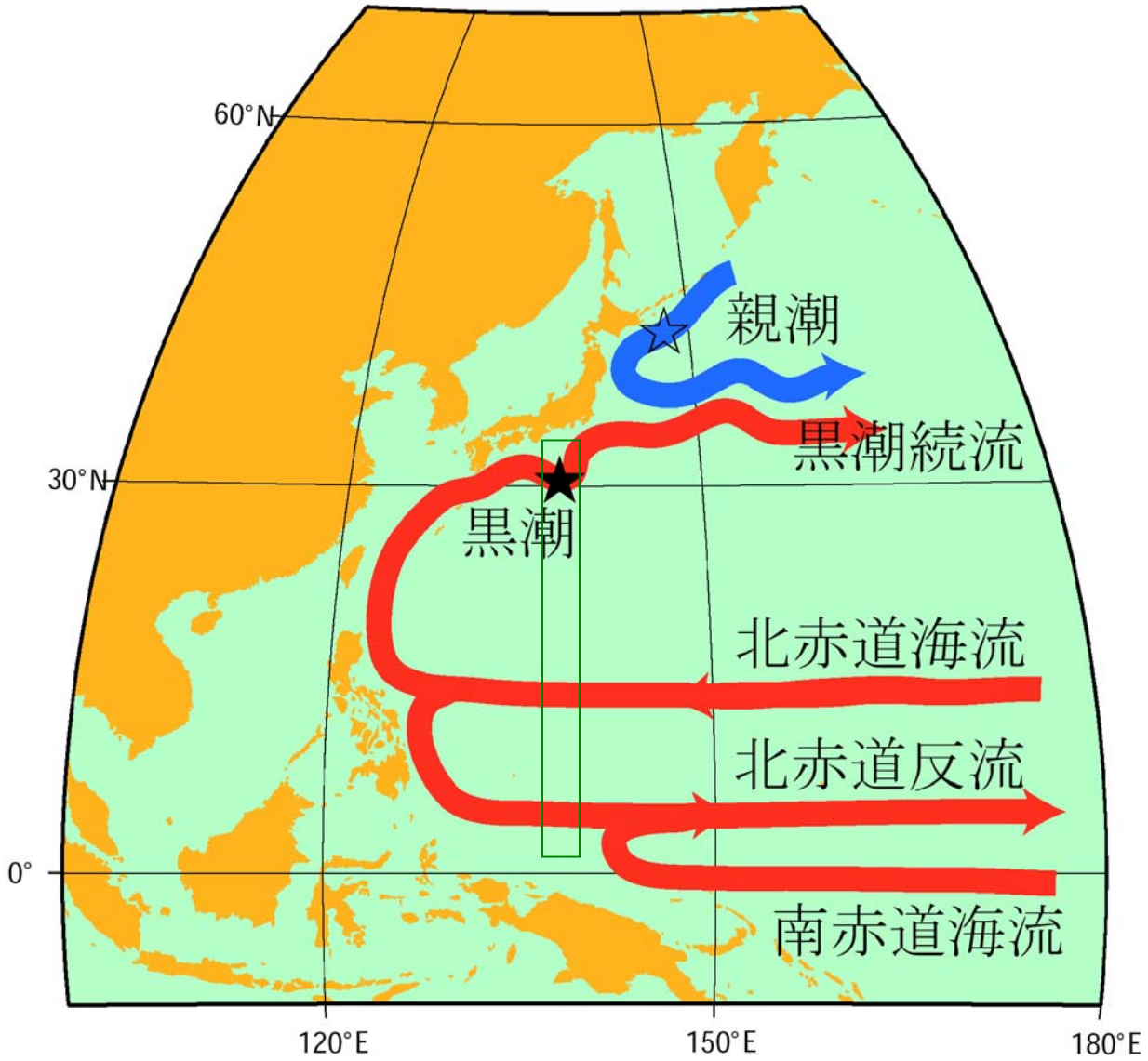
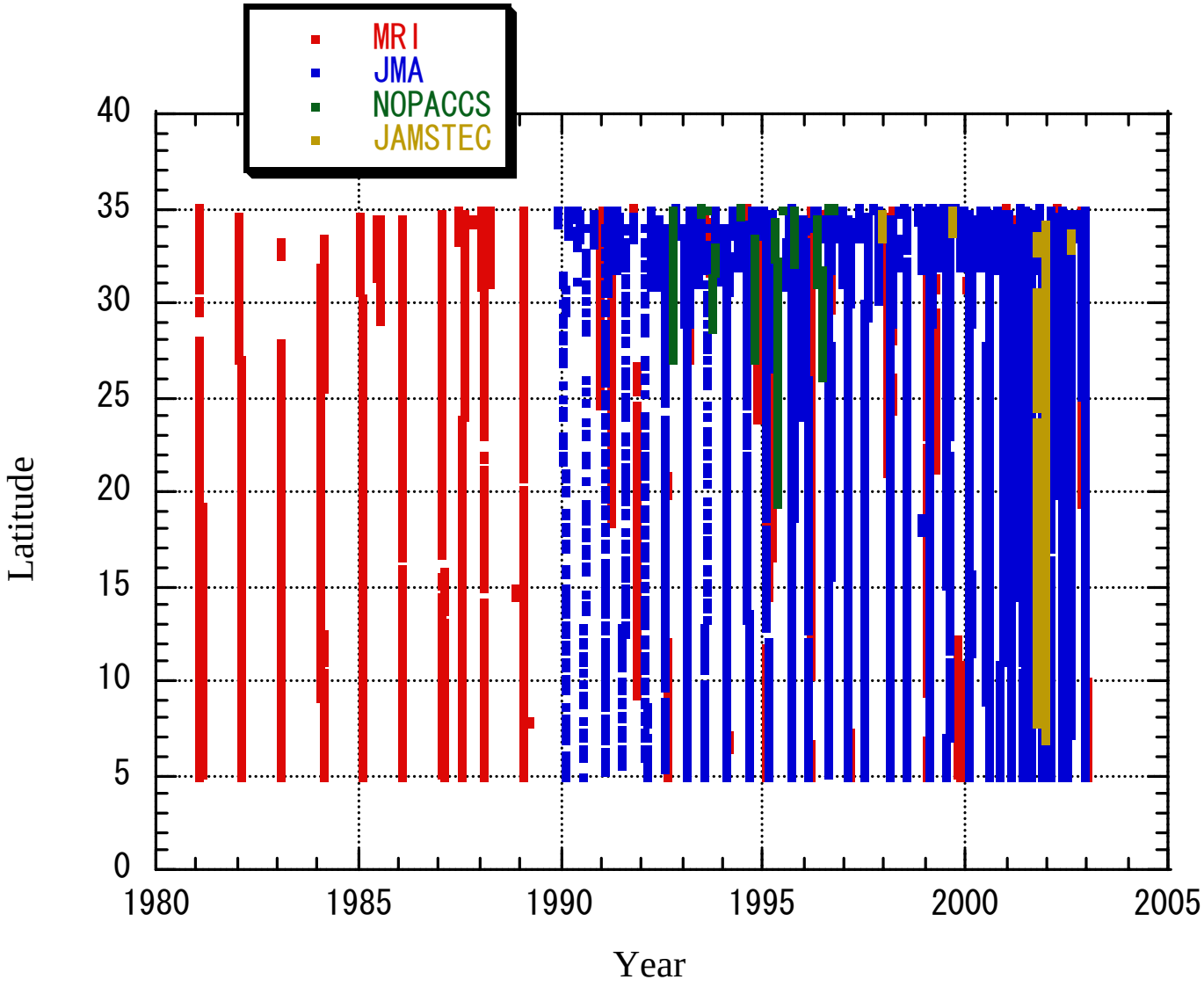
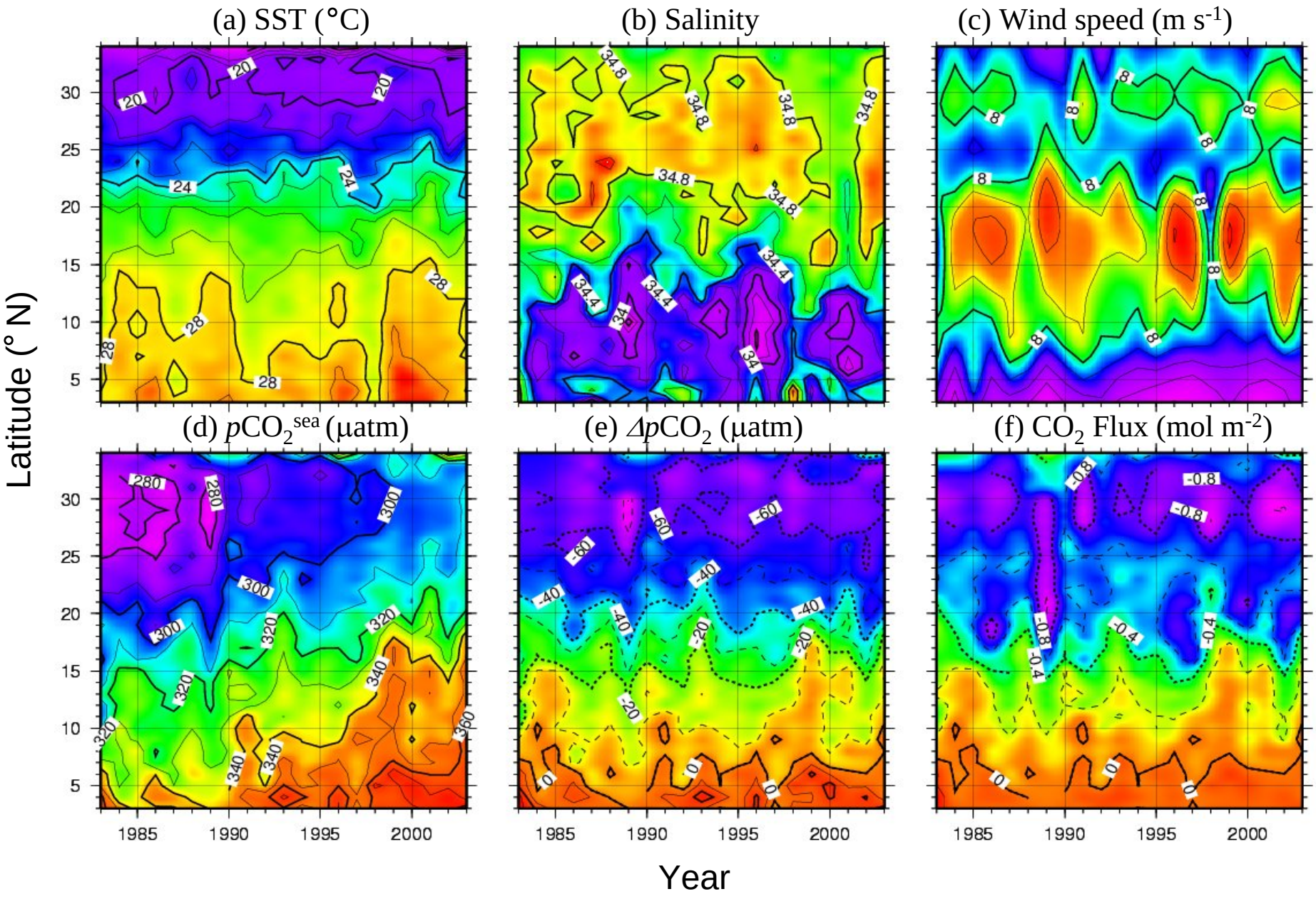
Surface current system south of Japan



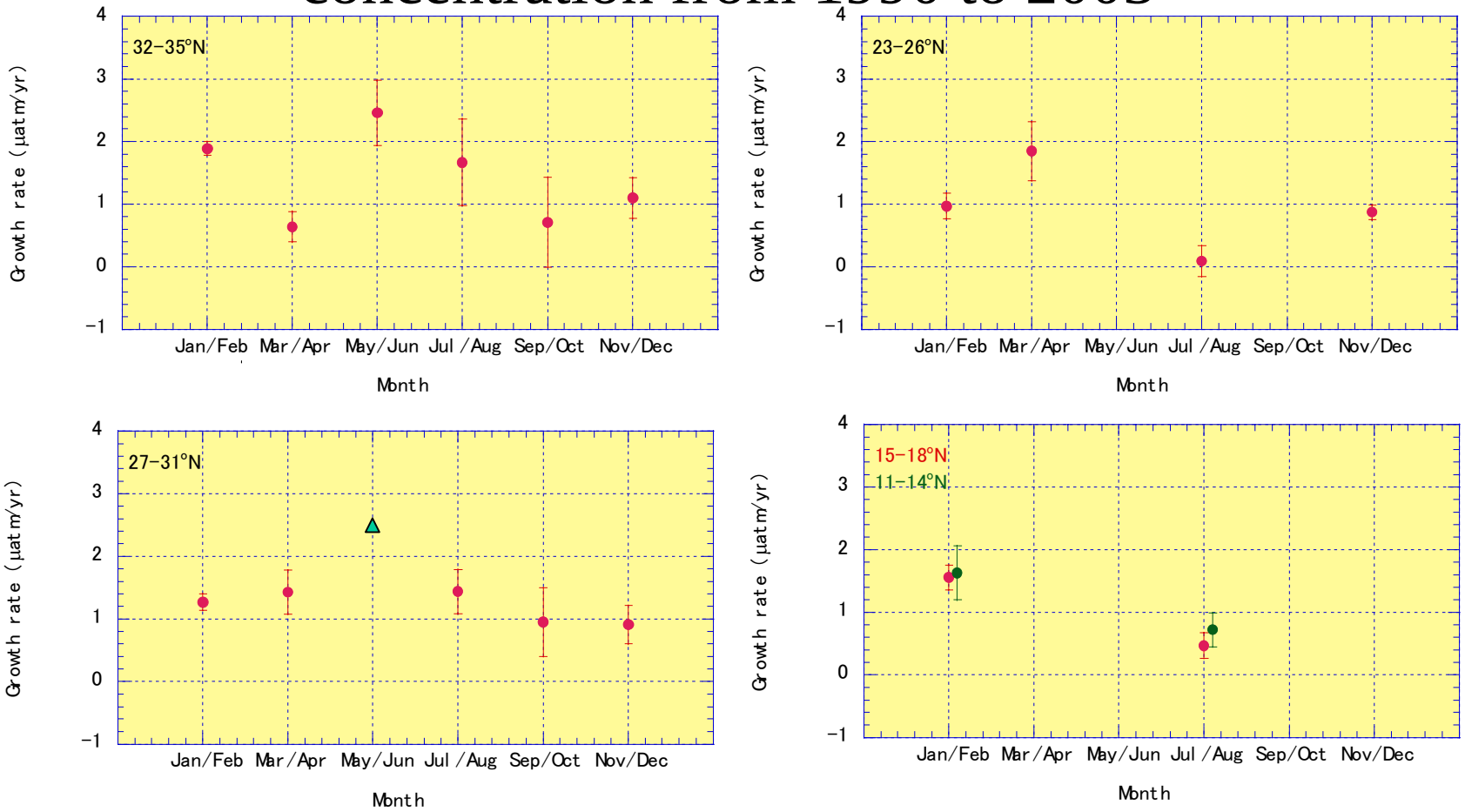
pCO_2 observation along 137°E during 1968 to 2003



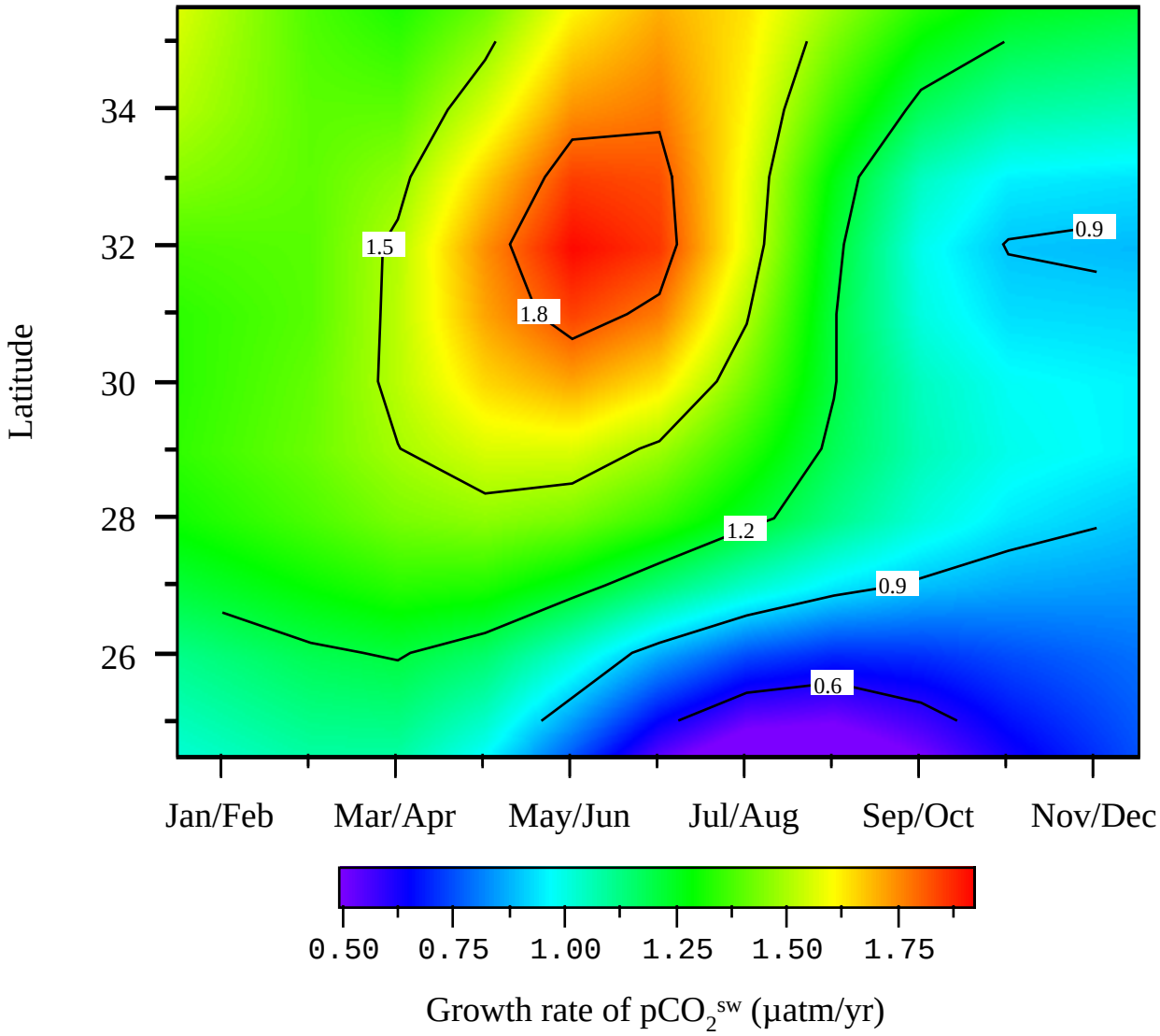
Time series of surface properties during winter of 1983-2003



Seasonal variation in the growth rate of mean concentration from 1990 to 2003



Contour plot of the growth rate of pCO_2^{sw}



Long-term and seasonal variations in pCO_2^{air} and pCO_2^{sw}

$$pCO_2(t) = a + bt + ct^2 + \sum_{i=1}^{2}\left\{d_i \cos(\omega_i t) + e_i \sin(\omega_i t)\right\}$$

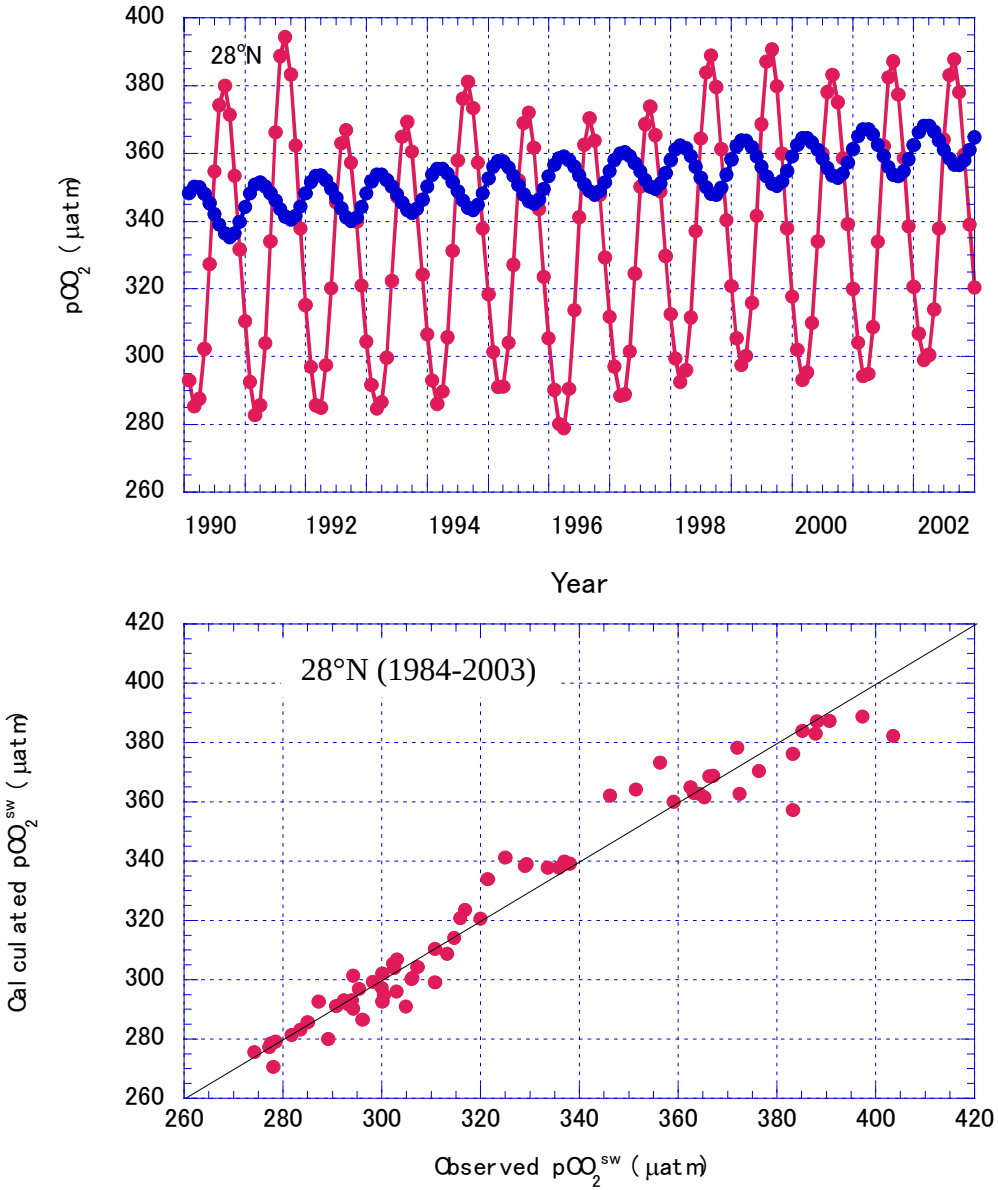
$$\Delta = pCO_2(obs) - pCO_2(t)$$

Low pass filters were used to smooth Δ

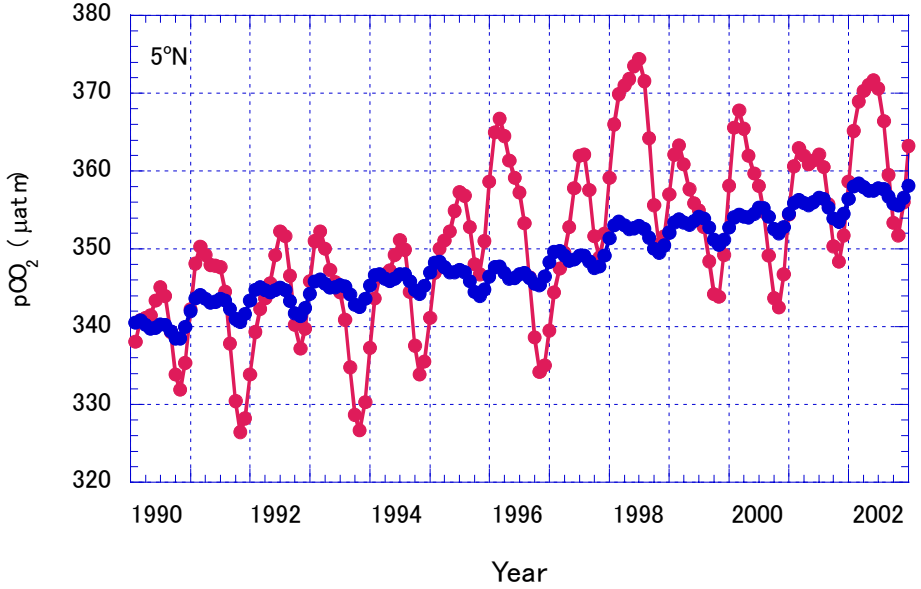
$pCO_2 = pCO_2(t) + \Delta_{smooth}$

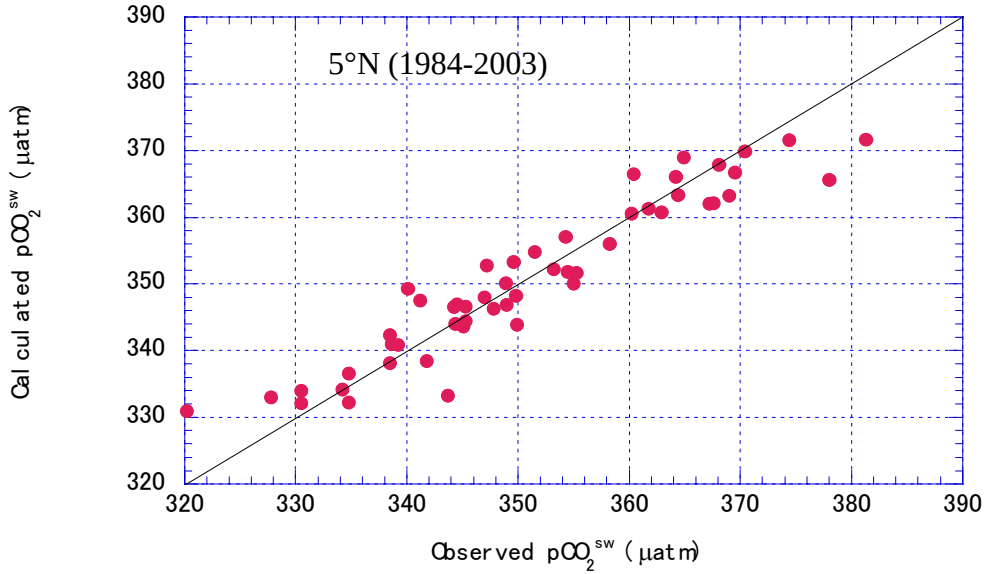
Method of analysis: Thoning et al. (1989)

Calculated pCO_2^{air} and pCO_2^{sw} at 28°N

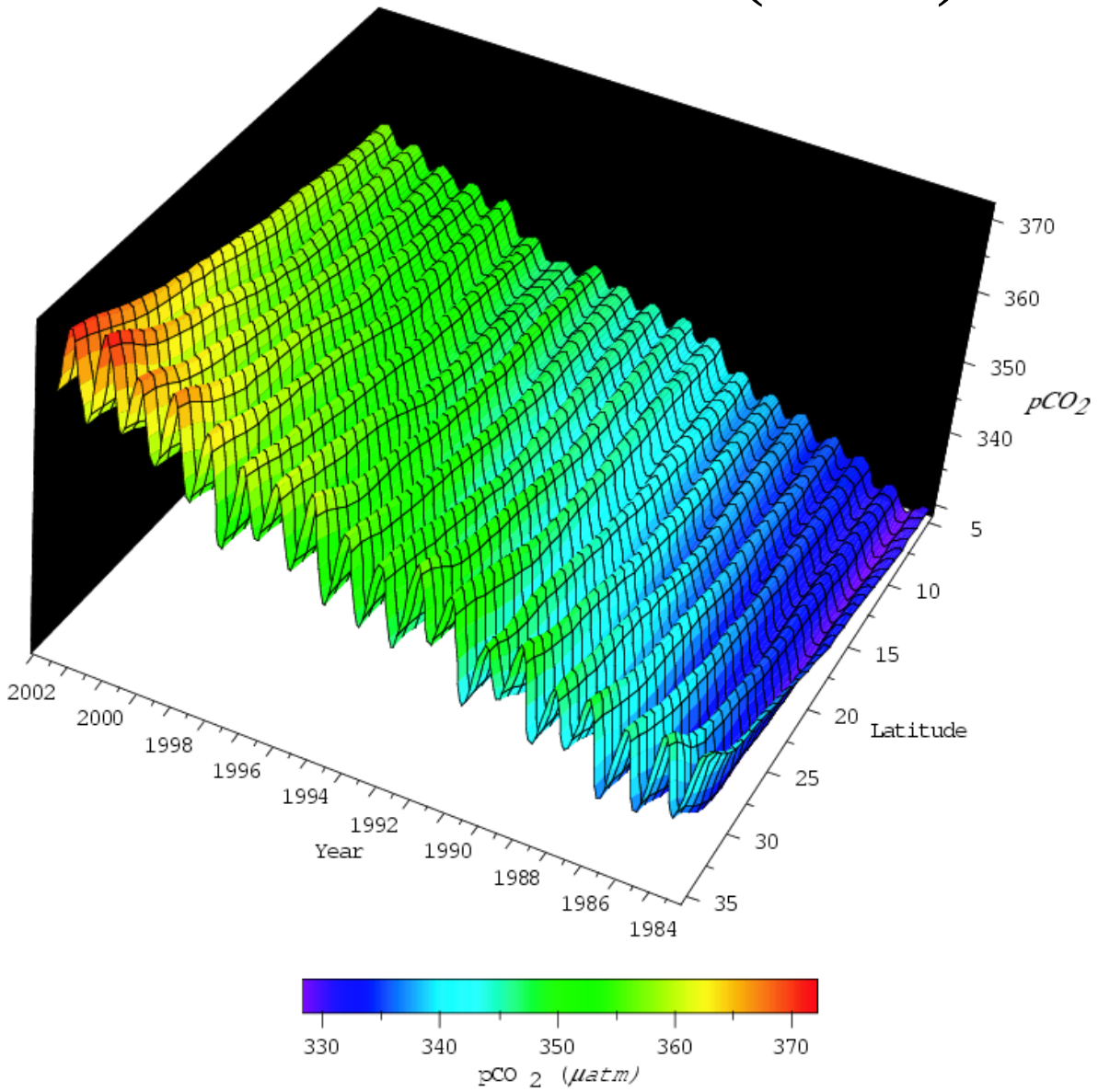


Calculated pCO_2^{air} and pCO_2^{sw} at 5°N

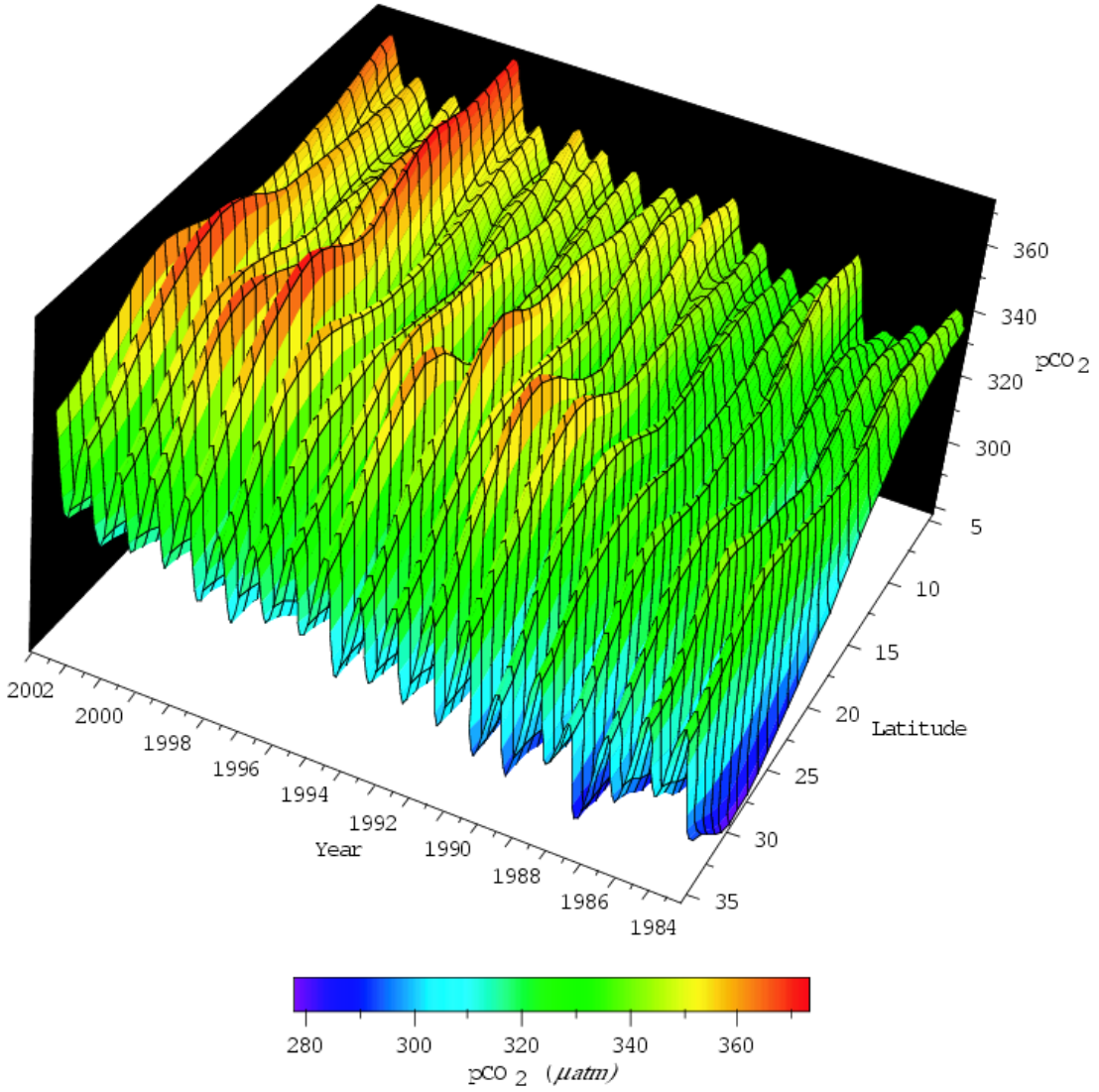




Three dimensional representation of the latitudinal distribution of pCO_2^{air} of the western North Pacific (137°E)



Three dimensional representation of the latitudinal distribution of pCO_2^{sw} of the western North Pacific (137°E)



Contour plot showing the temporal and spatial variations in the ΔpCO_2 in the western North Pacific