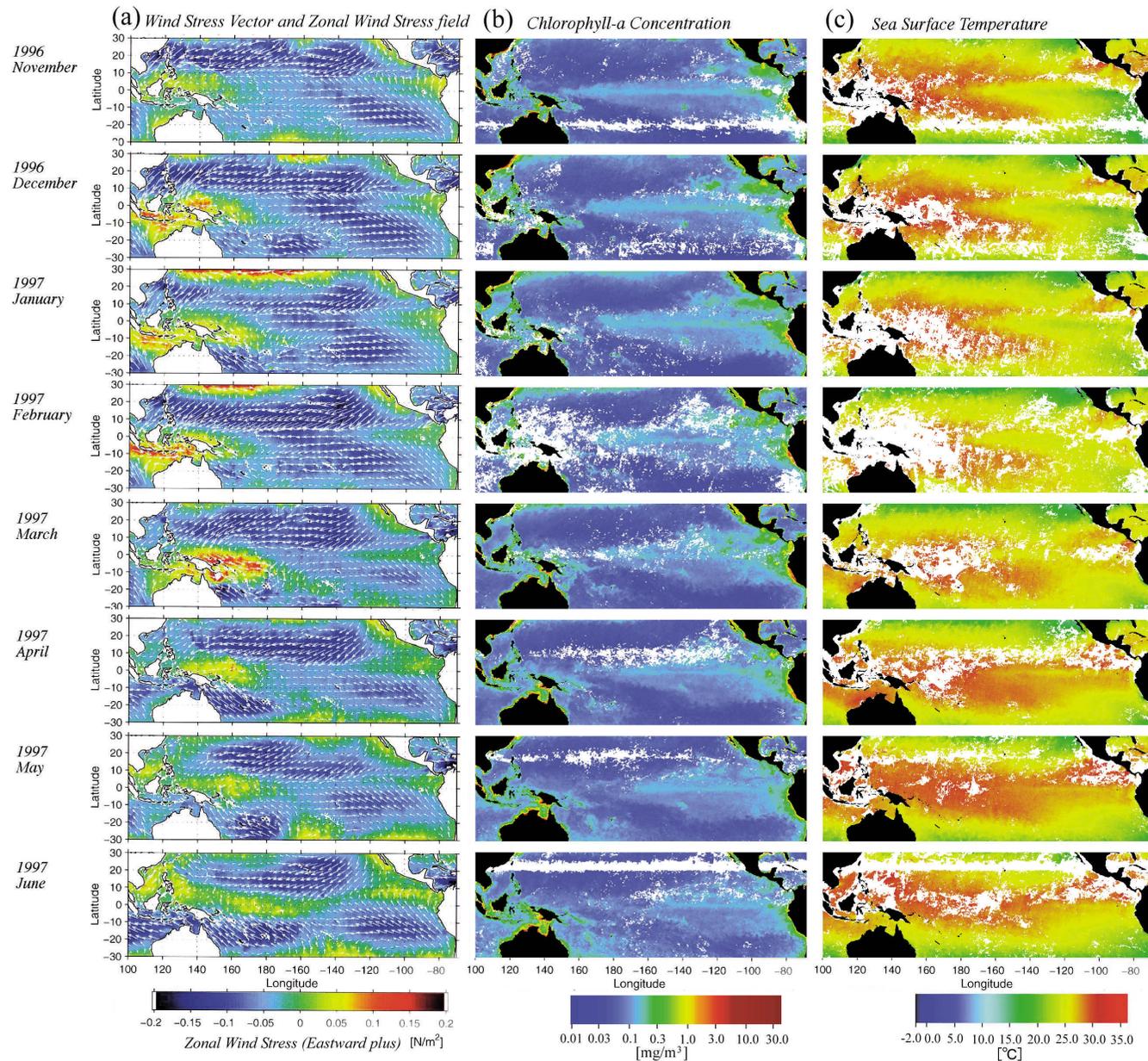


# 97/98 El Niño Captured by ADEOS



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In the tropical Pacific, the trade winds blow towards the west and drag the warm surface water westward. This causes upwelling of cold water from deeper layers in the area off the coast of Peru. Since the upwelling water masses are nutrient-rich, they cause an increase of phytoplankton. However, the trade winds relax after the El Niño event. Therefore, it has been proposed, based on some numerical model simulation results, that the phytoplankton and chlorophyll-a concentration (Chl-a) decrease during the El Niño since the upwelling is reduced due to the easterly wind relaxation and sea surface temperature (SST) increase. Although Chl-a distributions have been observed by ships and the Coastal Zone Scanner (CZCS) on board the Nimbus-7 satellite in the equatorial Pacific, the temporal and spatial resolution is not enough to capture the whole process of phytoplankton response to El Niño.

OCTS on board ADEOS was the first to observe Chl-a distribution related to the phytoplankton response to the 97/98 El Niño. Furthermore, the associated SST and wind variations are simultaneously observed by the OCTS infrared bands and NSCAT on board ADEOS, which is also quite unique. Figure 1 shows images of the monthly wind stress (\*1) vector and zonal wind stress intensity (color) obtained from NSCAT, the OCTS monthly Chl-a concentration, and the OCTS monthly SST in the equatorial Pacific for November 1996 to June 1997. From November to February, the trade winds blow over the eastern to central equatorial Pacific, and high Chl-a and low SST tongues appear from the coastal sea off the South American continent to the central region. From April to June, the easterly winds are weakened over the central Pacific, and the low SST and high Chl-a tongues recede. However, while the low-SST tongue mostly disappears, the high Chl-a tongue still maintains where the easterly winds blow. ADEOS observations revealed that the response of the Chl-a field differs from that of SST in the equatorial Pacific.

\*1 Wind stress: Stress which affect on the sea surface

### Reference

Murakami H., J. Ishizaka, and H. Kawamura, submitted to 'Science', 1998