

Tropospheric Ozone During the Intensive Ozone Network Study (IONS) 2010/CalNex from Ozonesonde Observations: Stratospheric Influence and Long-Range Transport

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During a six-week period from mid May to mid June 2010, near daily ozone profile measurements were made at six sites in California as part of IONS 2010 during the CalNex Campaign. These sites were broadly distributed from north to south with four of the sites located along the California coast from Trinidad Head in the north to San Nicholas Island in the south. Two stations were located inland at Shasta State Historic Park in the north and Joshua Tree National Park in the south. While major local or regional pollution episodes were relatively few during this period, a number of stratospheric intrusion events were observed. Several of these reached the mid-troposphere down to as low as ~2 km. In two cases the intrusion event could be detected at nearly every location extending from the most northerly to southerly site. The extensive coverage in time and space of the ozone soundings allows them to be related to the broad scale meteorological pattern. The balloon launches were coordinated to take place at ~2200 GMT (1400 LST) near the synoptic analysis time of 0000 GMT. In addition to the “background ozone” associated with flow from the Pacific that reaches the coast of California, episodic events of enhanced ozone that appear to be related to more direct transport from Asia are also present in the multi-layered structure of the ozone profiles.

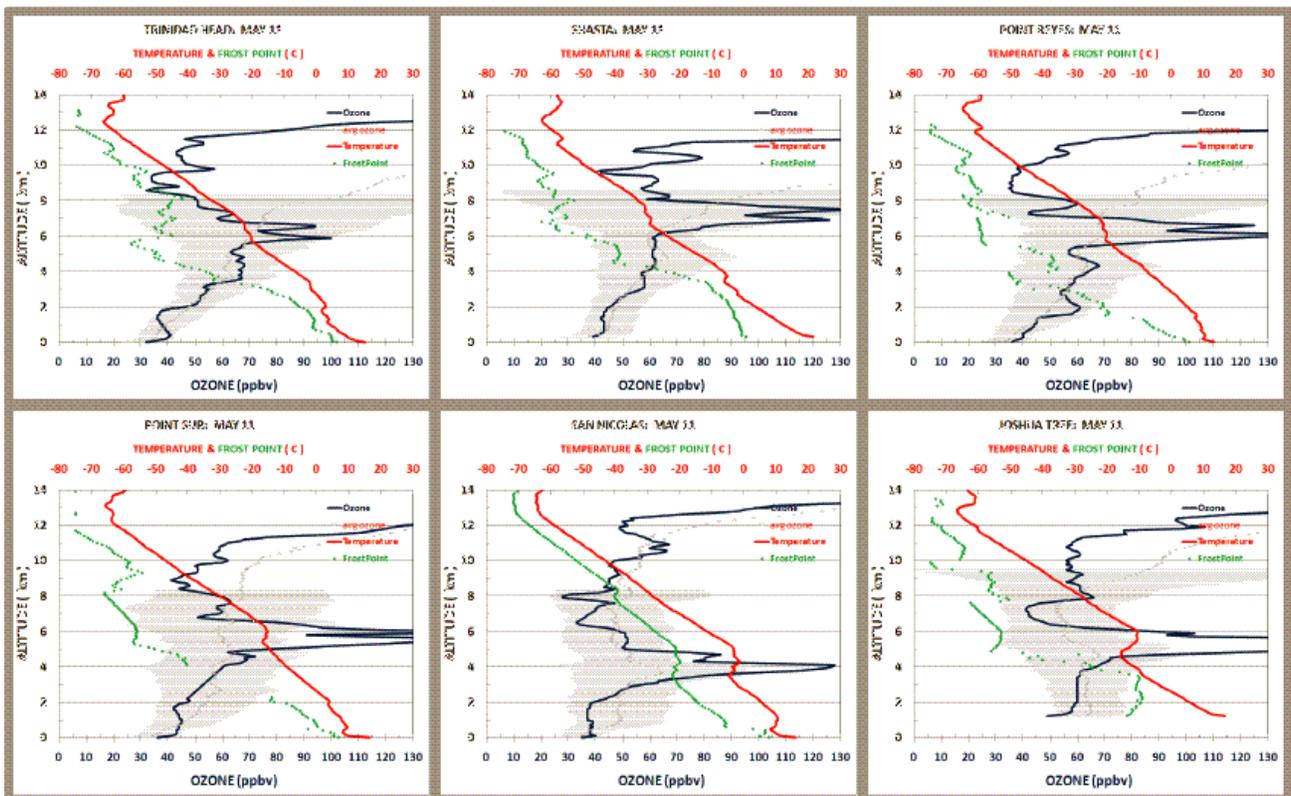


Figure 1. Ozonesonde profiles on May 11, 2010, from six sites in California during the IONS 2010/CalNex Campaign showing a strong stratospheric intrusion affecting all of the sites.