

FINE AND ULTRAFINE AEROSOLS IN SOUTHWESTERN

VEGETATION ON SIZE AND NUMBER DISTRIBUTIONS

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In SW Australia a change in rainfall was observed during the last 30 years between native vegetation (+15%) and agriculture (-15%), possibly caused by changes in land use with subsequent effects in albedo, water vapor transport, atmospheric stability, salinity and precipitation.

Satellites more often detect clouds above the native vegetation

Can differences in precipitation be traced back to (micro)meteorology, regional transport and/or aerosols?

The **BUFEX** experiment utilizes the clear separation of two homogeneous land use areas by the Rabbit Proof Fence (**Bunny Fence**) for airborne investigations of meteorology, water vapor transport, aerosols and cloud, microphysics in a natural laboratory

Wheat belt (two seasons) <-> natural vegetation (Shrubs, Eucalyptus trees)

Where in the world?



Results

Coarse particles very low <math>< 10/cm^3</math> (> 300 nm)

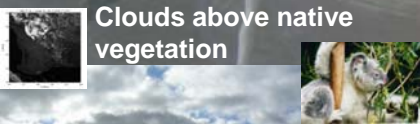
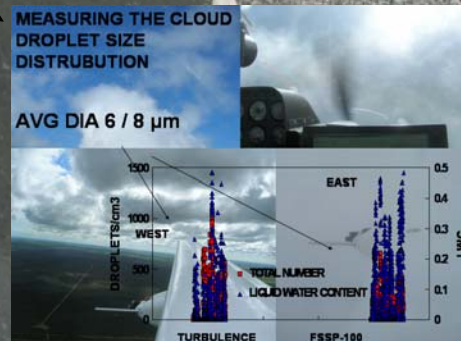
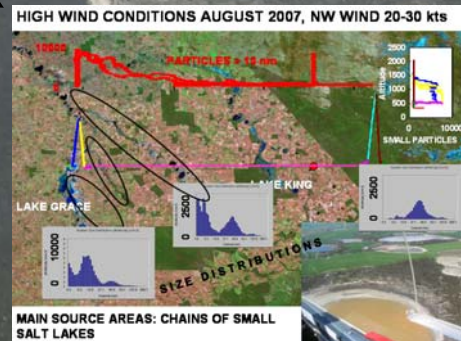
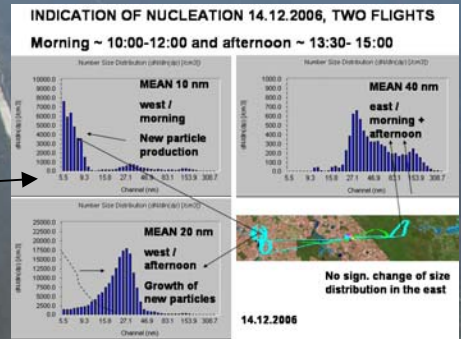
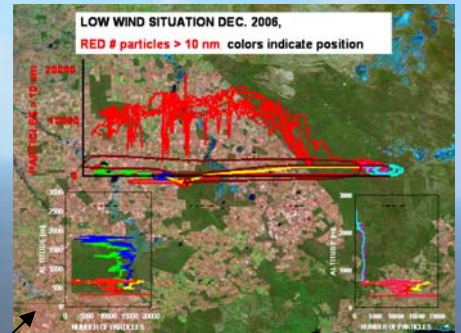
Clear increase (~ * 10) of fine particles above the agriculture

Nucleation mode particles observed on all days, but not above the native vegetation

Main aerosol production (nucleation?) areas: salt lakes areas, not above lakes in native vegetation

No significant difference between summer (Dec 06) and winter season (Aug 07) despite different wind and H₂O transpiration and concentration

Within clouds above the agriculture more and smaller droplets and less liquid water compared to clouds above native vegetation



Clouds above native vegetation



The airborne platform at Lake King airstrip



Numerous small salt lakes, source areas for ultrafine particles



AEROSOL SIZE DISTR. 5 nm – 20 μm (GRIMM) + > 10 nm (TSI 3010)

