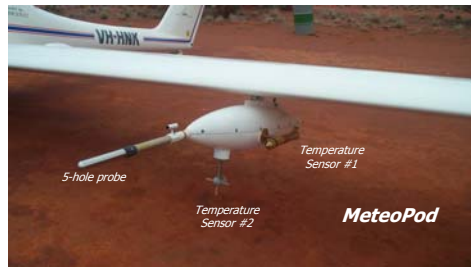




Flow over Complex Terrain as Measured by Aircraft

Jorg M Hacker and Caecilia Ewenz
Airborne Research Australia / Flinders University
Adelaide / Australia



Aircraft: ARA Grob G109B
Instrumentation: MeteoPod
Novatel GPS
Trimble TANS Vector attitude GPS
Location: Gladstone/Queensland
February 2002



Study area:
Petro-chemical plant near coast
ridge line and valley inland

13:09-13:53

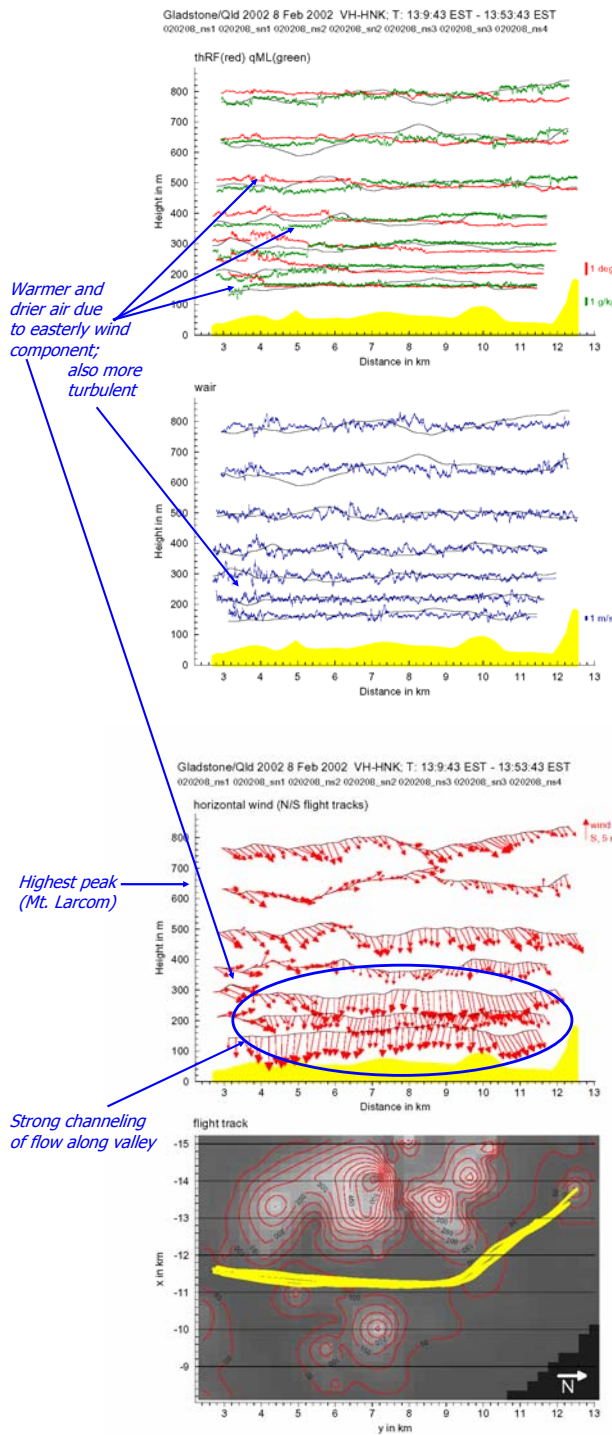
Along valley traverses

13:58-14:32

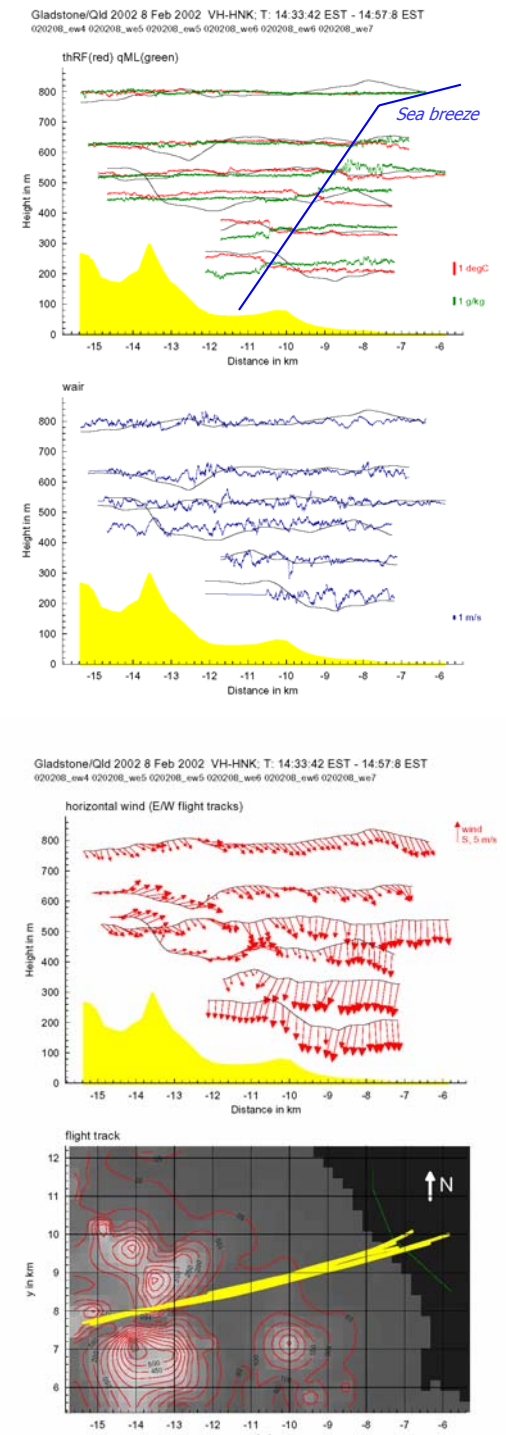
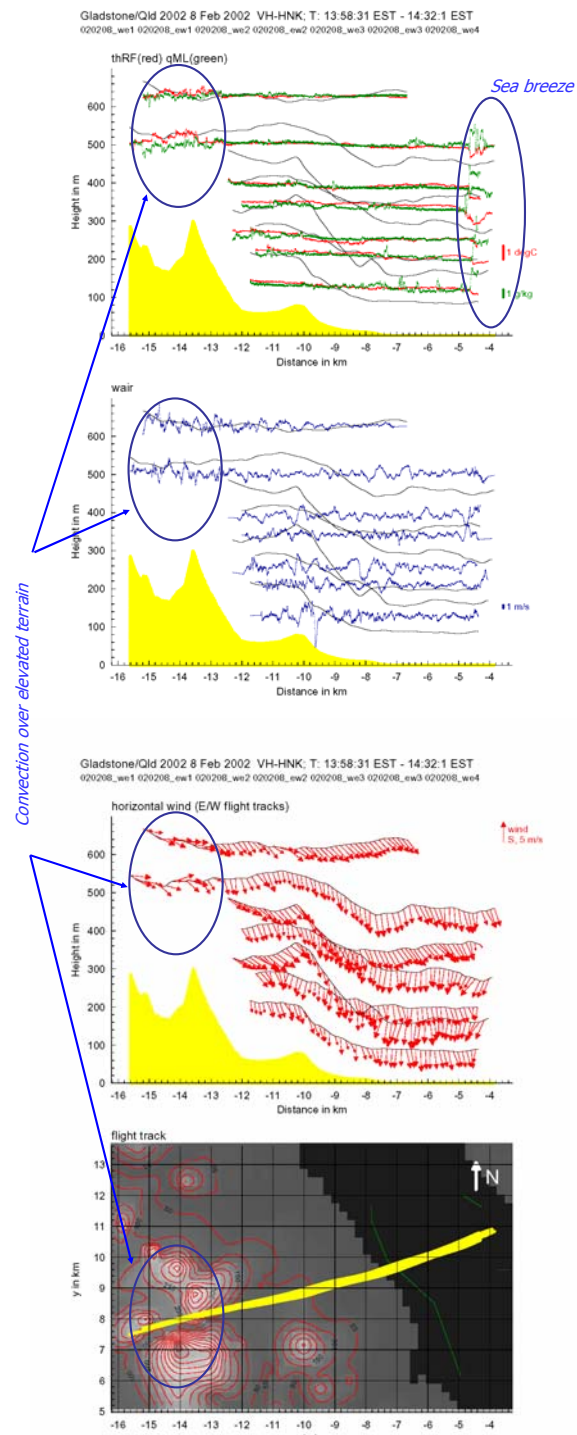
Across valley traverses

14:33-14:57

Across valley traverses



Fluctuations of
Potential temperature
Specific humidity



Plumes from a petro-chemical plant near the coast just north of Gladstone/Q. are being carried by the seabreeze across a coast-parallel ridge into a small valley.

The plumes have led to an odour problem in the area and some numerical simulations have been undertaken to establish the local wind circulation.

To verify the numerical simulations, aircraft measurements were carried out over the ridges and the valley.

The aircraft measurements clearly show the channeling effect within the valley, restricting the wind to basically a northerly airflow beneath a weaker north-easterly synoptic airstream.

The development of a weak sea breeze can be seen in the successive across valley traverses.

Measurements carried out by ARA under contract to:
Pacific Air and Environment Pty Ltd of South Brisbane
www.pae.net.au