# The Tropical Warm Pool International Cloud Experiment

# TWP-ICE
# Darwin, Jan/Feb 2006

Peter May & Christian Jakob (BMRC)
Jim Mather & Chuck Long (PNNL)
+ John McBride, Eric Shulz, Tom Keenan, Phil Meighen, Andrew Hollis,
Numerous people in the Bureau, and……

# TWP-ICE 2006 – Agencies involved

U.S. Department of Energy – ARM program

Bureau of Meteorology

ECMWF

NASA

CSIRO

Airborne Research Australia

Universities (Utah, Illinois, Monash, Adelaide, York, Wales, Osaka, Kyoto …)

European Union (SCOUT program)

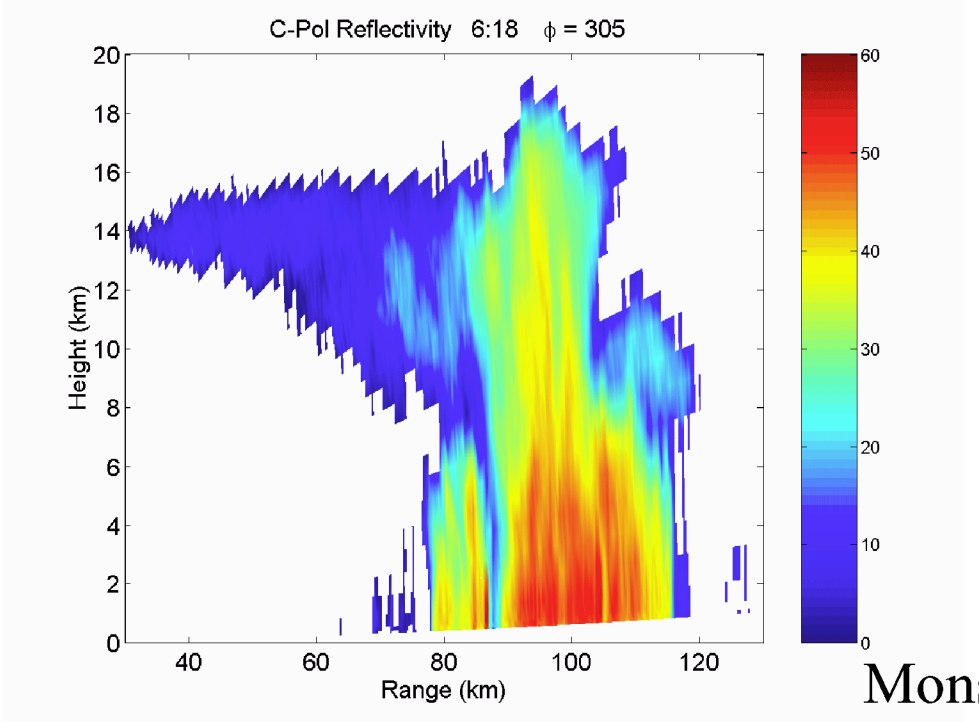
DLR (German Aerospace Center)

# GOAL

Describe and understand monsoonal cloud structure and evolution and their impact on the environment with an emphasis on convectively generated cirrus clouds.

Through:

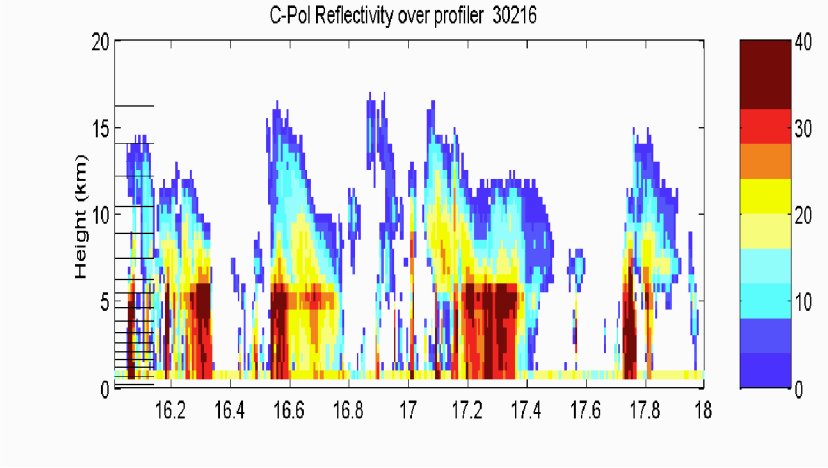
Remote sensing of cloud structure, microphysics, chemistry
In-situ measurement of microphysics, thermodynamics, chemistry
Modeling of monsoonal cloud systems




Build up convection

Coastal/continental
Deep, electrically active
Strong vertical motions
Strong afternoon max.
Sampled CRYSTAL-FACE,EMERALD, MCTEX…

Monsoon convection

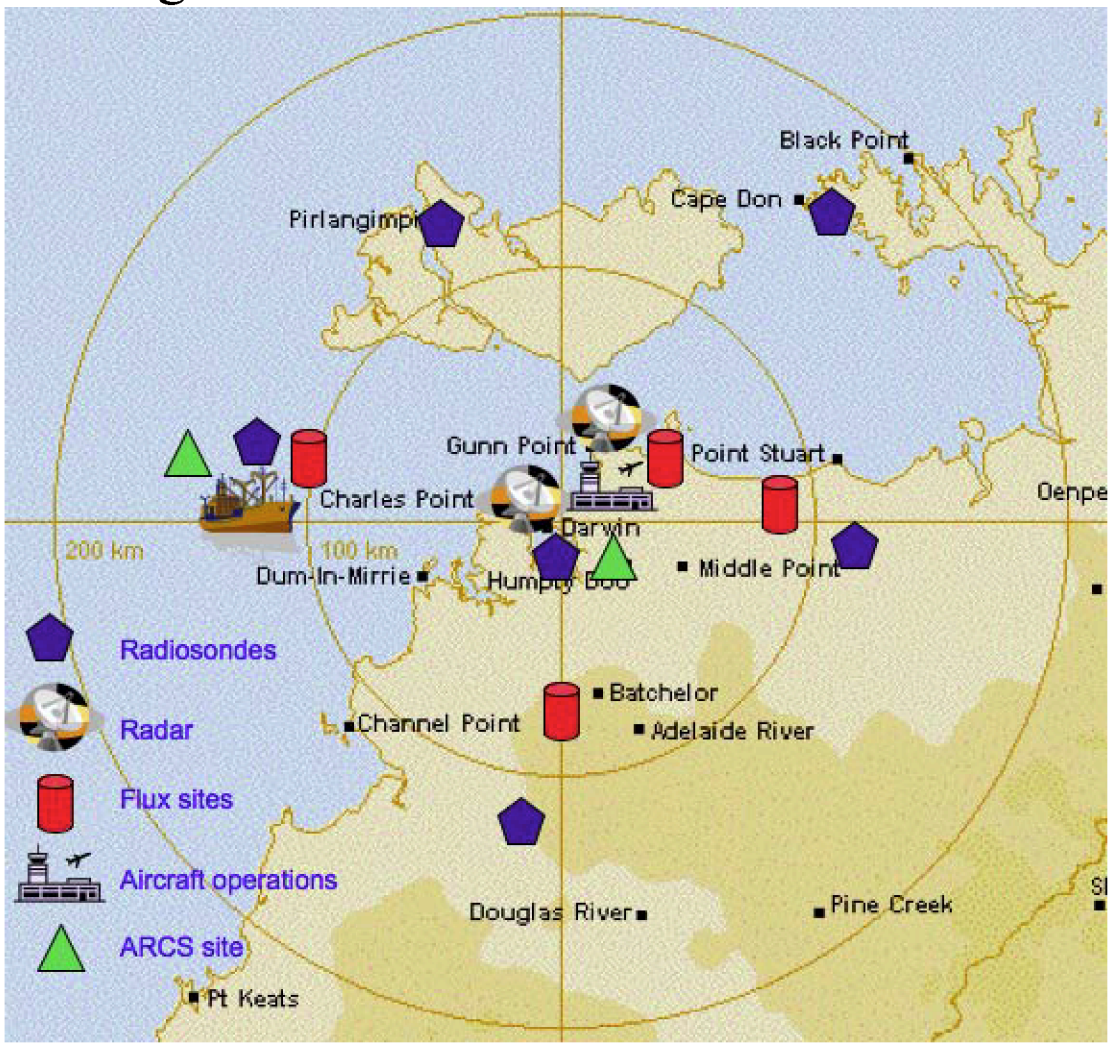



Oceanic
Rapid decrease in Z above FZL
Weaker vertical motion
Weak night-time max.
Sampled AMEX,TOGA-COARE…

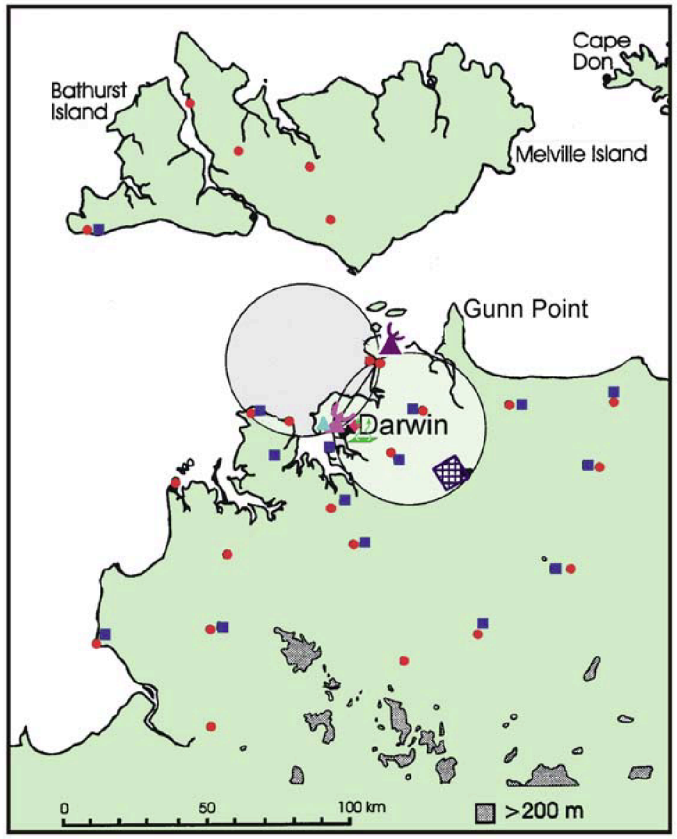
**We want an end to end experiment**

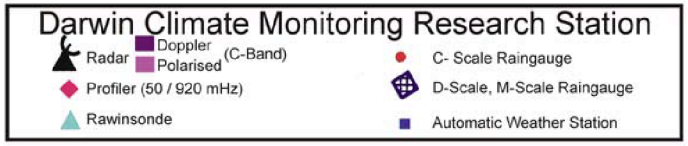
# The ground observation network

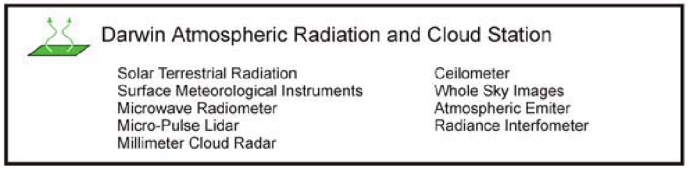
Soundings in Indonesia



# Background - The DCRS/ARM sites




ARM operational:

MMCR
MWR
WSI
Surface Met
Ceilometer
SkyRad: PSP/PIR UVB Global PSP
MFRSR IRT
MPL
AERI (2004)

BoM data sets:

Polarimetric radar (5cm)
Doppler weather radar
Profiler (50 and 920 MHz)
AVHRR, MTSAT
Radiation
Surface Met (> 10 AWS)
Soundings
NWP

Other data:

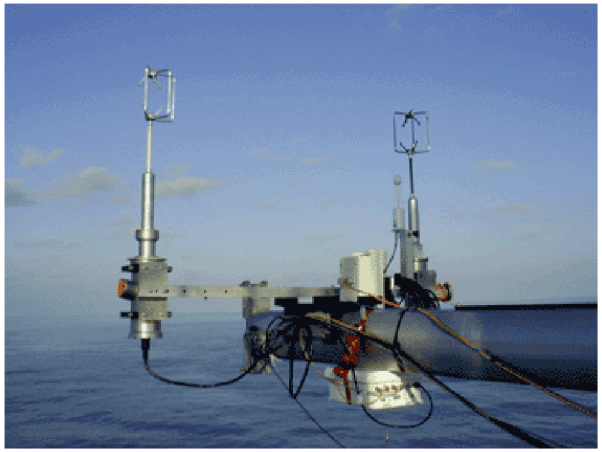
Lightning Network (Osaka)
Profiler (50MHz , Adelaide)
Cimel (CSIRO)
BoM NWP
ECMWF
Other satellites

# The roles of the RV Southern Surveyor

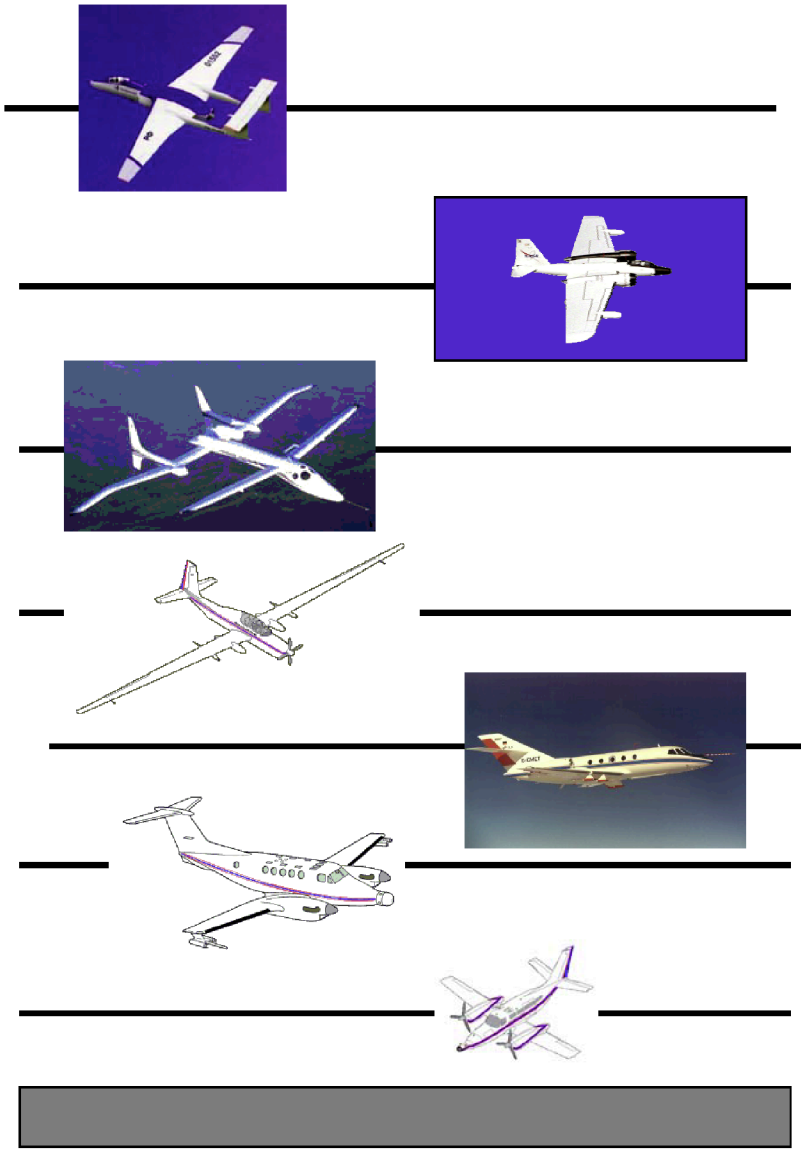
Radiosonde launches to close the array

A second ARCS site

Ocean surface flux measurements



# TWP-ICE 2006 - Aircraft



20 km — M55 Geophysica : In situ microphysics, chemistry

17 km — B57 : In situ microphysics, chemistry, state

15 km — Proteus:Remote sensing, in-situ

13 km — Egrett: In-situ

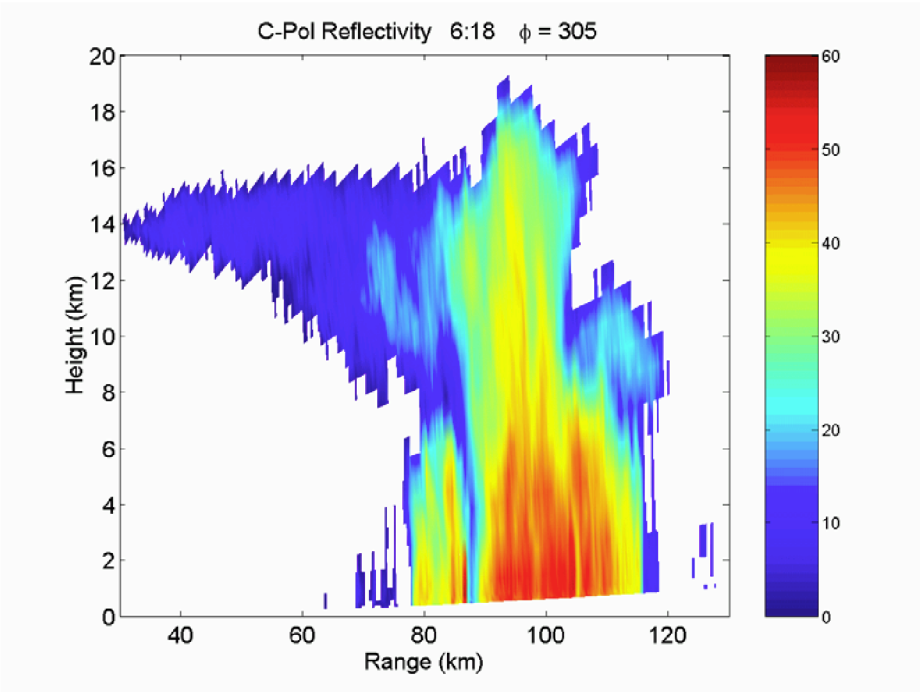
10 km — DLR Falcon: in-situ, remote sensing

5 km — King Air: In-situ, upward-looking remote

PBL — Dimona: Flux measurements, BL structure

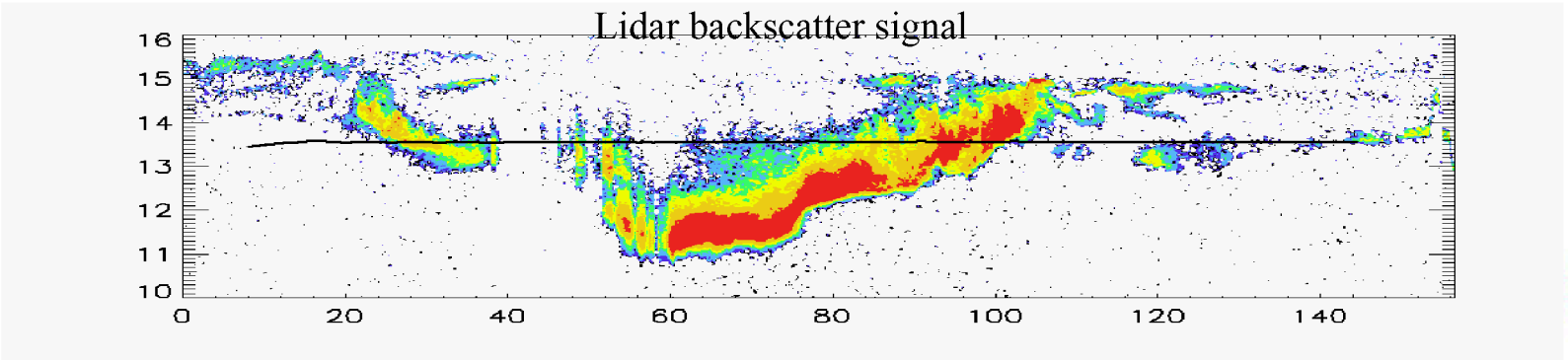
# Remote sensing

## Ground-based




## From Space

## Airborne



The current version of the science plan can be downloaded from:

http://science.arm.gov/twp/

Contacts:


Peter May p.may@bom.gov.au
Christian Jakob c.jakob@bom.gov.au
Jim Mather jim.mather@pnl.gov