YMC-NCAR Aircraft Mission Objectives

Shuyi S. Chen (U. of Miami) and Andy Heymsfield (NCAR)

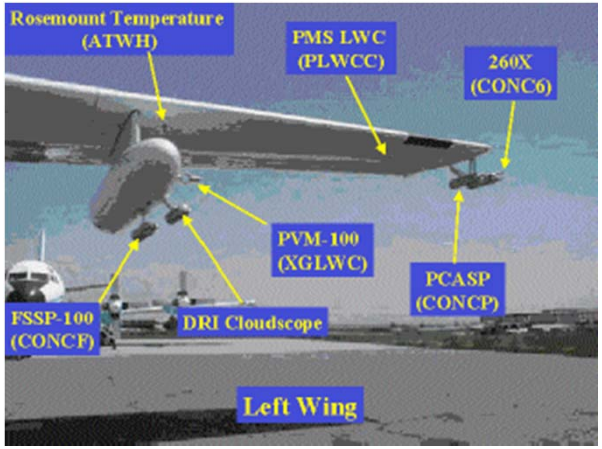
- To characterize deep convective processes and better understand the complex feedback processes among land-sea surface forcing, cloud microphysics-dynamics-thermodynamics, and environmental conditions
- To extend point measurements on islands and ships to a broader region and provide a large-scale context over MC
- To obtain a suite of observations suitable for coupled model evaluation (and explore coupled model data assimilation).

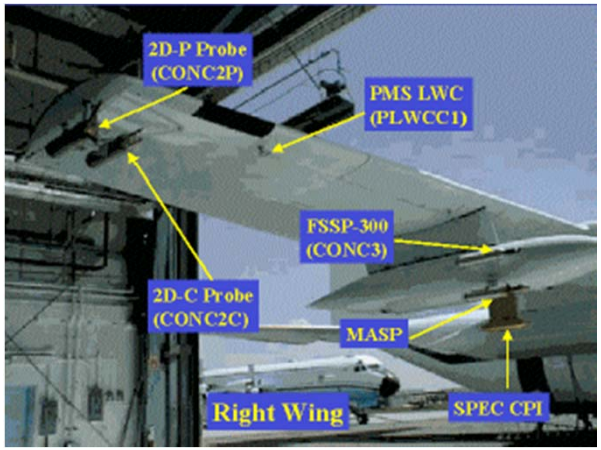
Base and Flight Paths: TBA

Time: Nov-Dec 2018

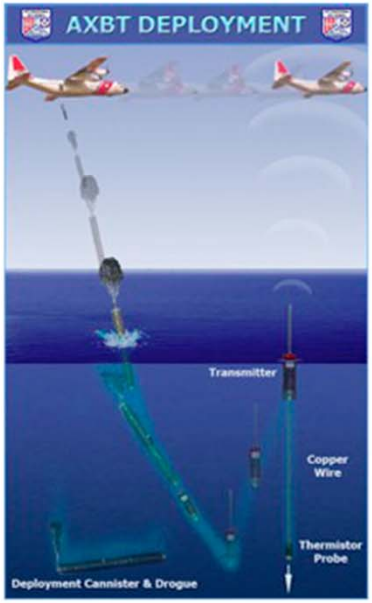
NCAR C-130

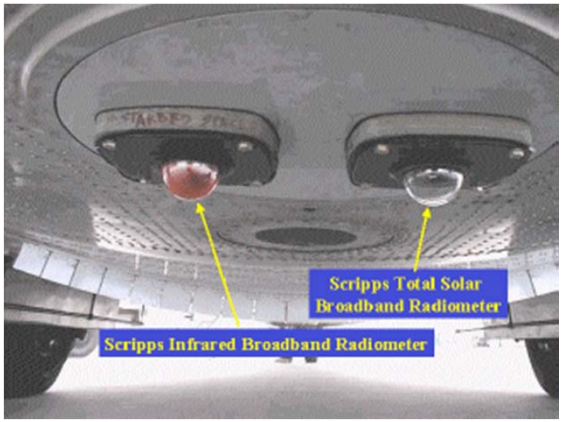

National Center for Atmospheric Research
N130AR
Research Aviation Facility


Rosemount Temperature (ATWH)
PMS LWC (PLWCC)
260X (CONC6)
PVM-100 (XGLWC)
PCASP (CONCP)
FSSP-100 (CONCF)
DRI Cloudscope
Left Wing

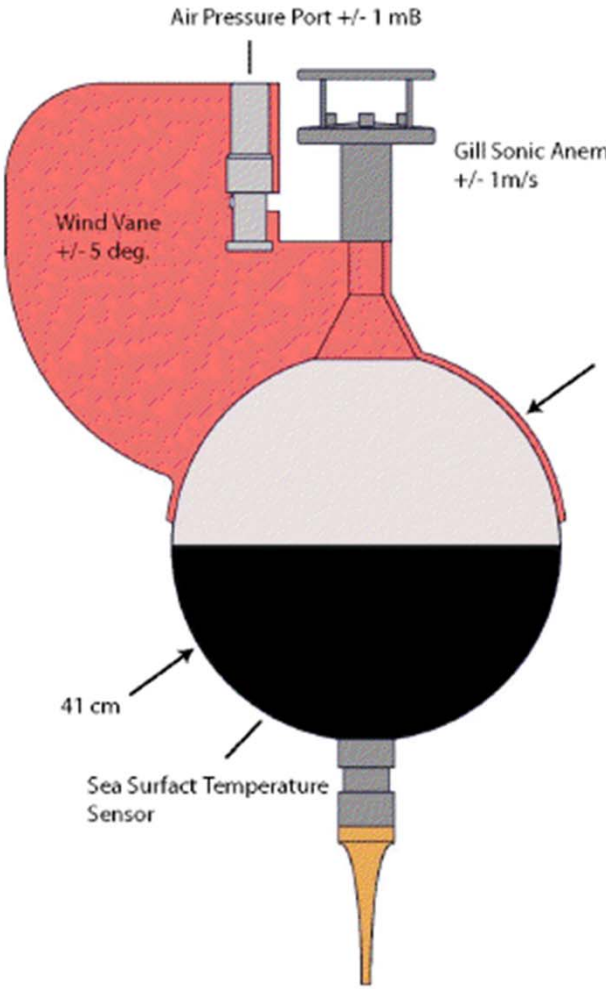

2D-P Probe (CONC2P)
PMS LWC (PLWCC1)
FSSP-300 (CONC3)
2D-C Probe (CONC2C)
MASP
SPEC CPI
Right Wing

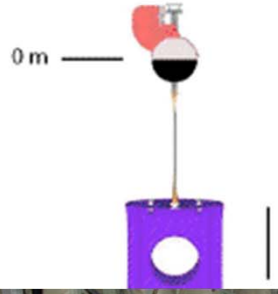

AXBT
36B

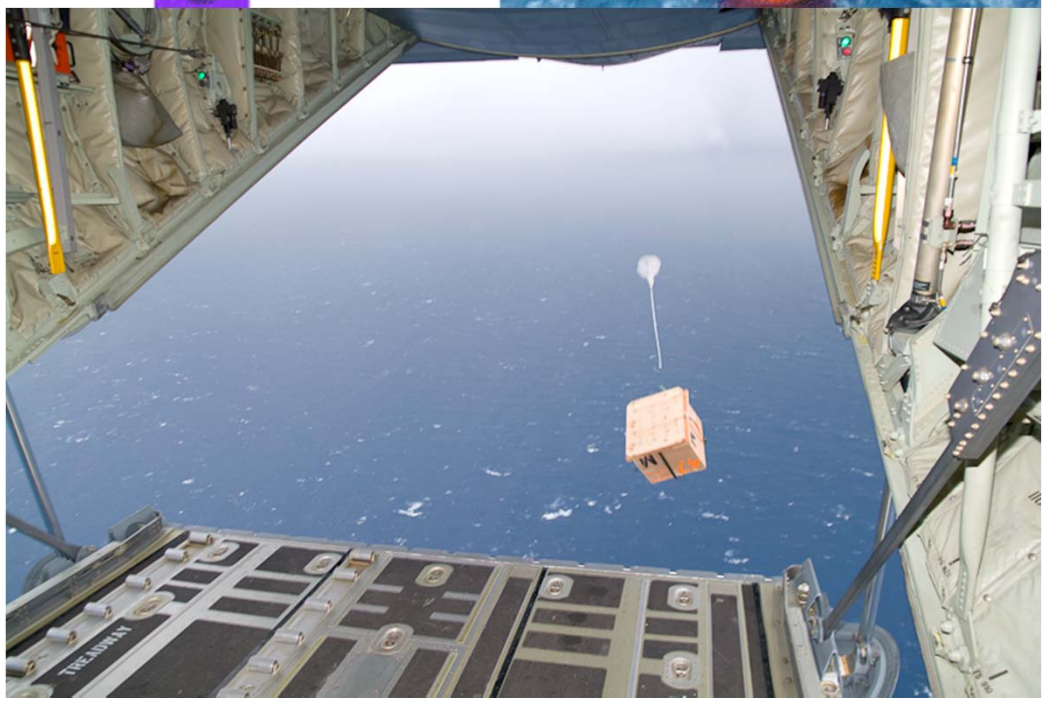

AXBT DEPLOYMENT
Transmitter
Copper Wire
Thermistor Probe
Deployment Cannister & Drogue


Scripps Total Solar Broadband Radiometer
Scripps Infrared Broadband Radiometer

Sonic Minimet Drifter

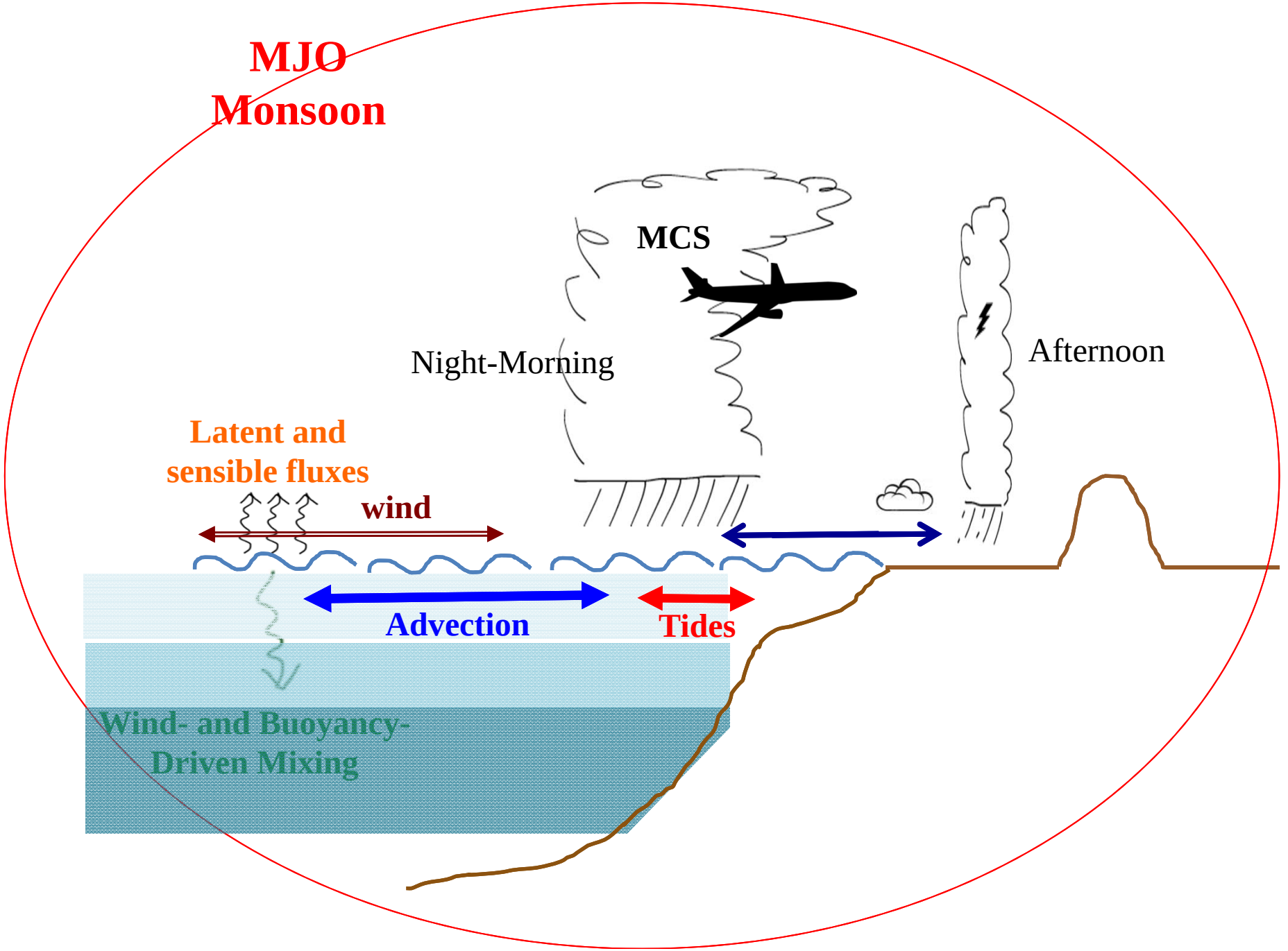




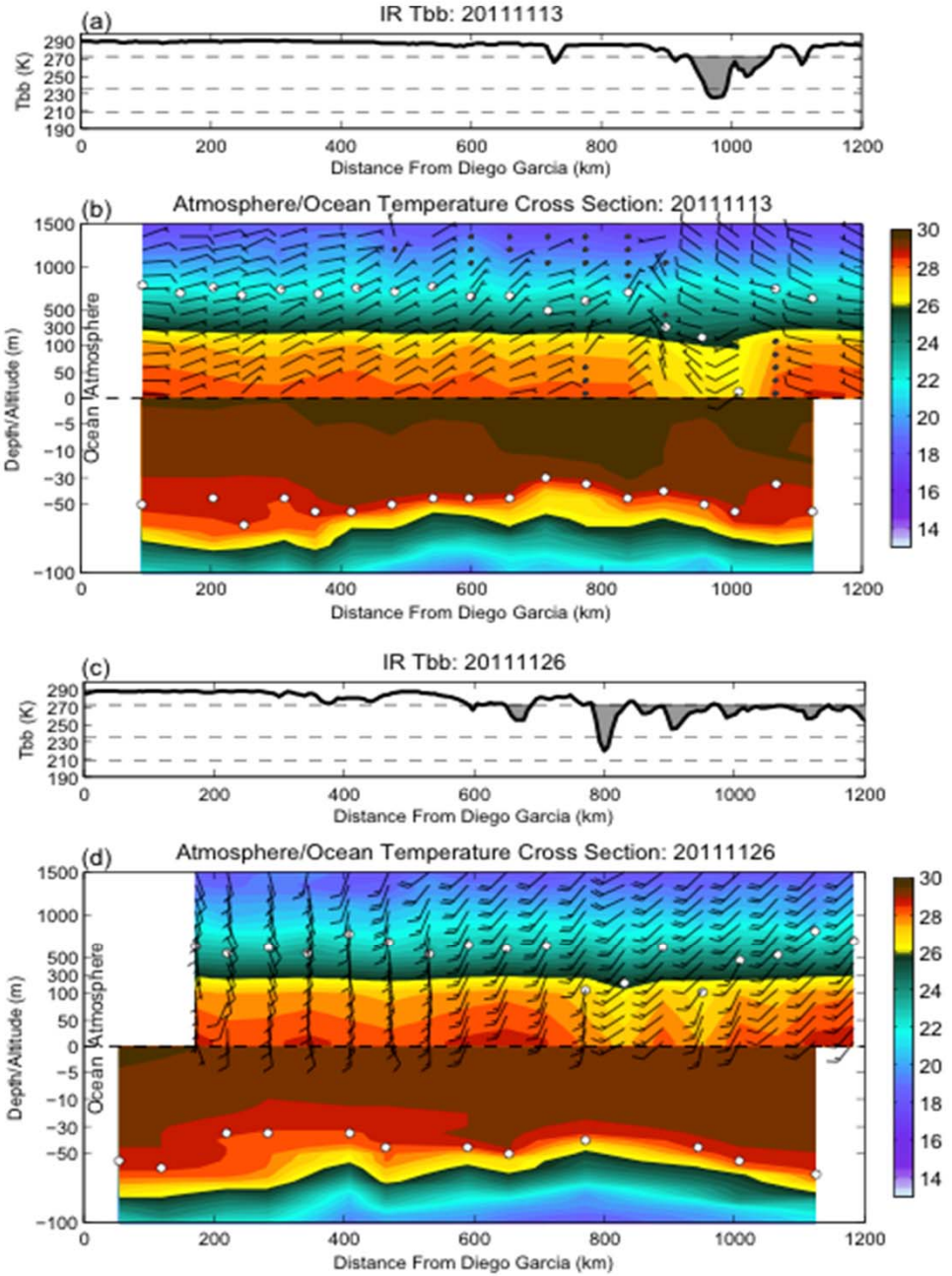


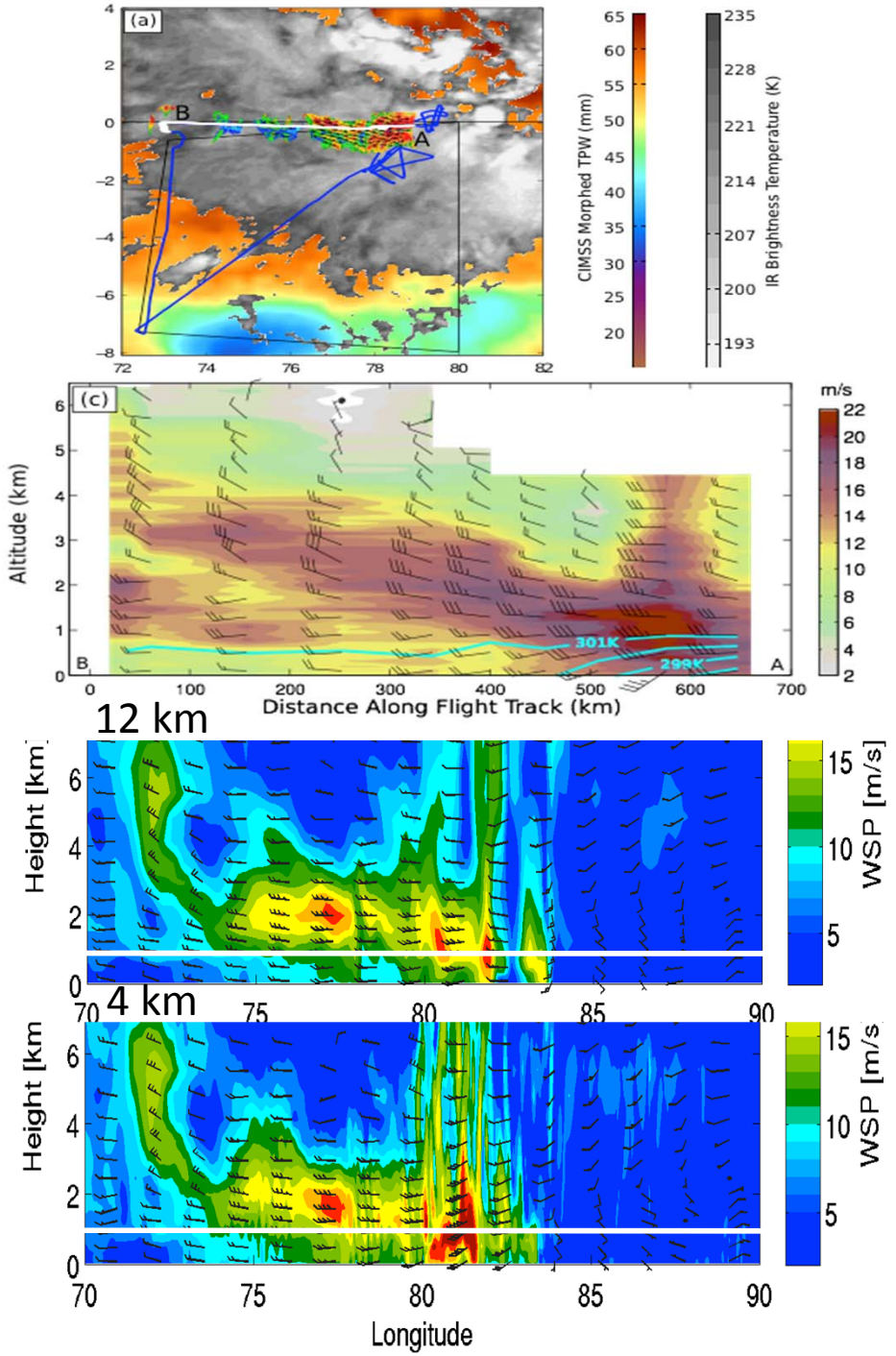
Aircraft Instruments

Flight Level *in situ* Sensors:	**Navigational parameters** **Pressure and thermodynamic parameters** **Mean winds and turbulence** **High-rate T, q, CO_2 perturbations**
Radar and Lidar:	**C-band Doppler radar** **Wyoming Cloud Radar and Cloud Lidar, looking both upwards and downwards.**
Expendables:	**GPS dropwindsonde atmospheric profiling system** **Airborne eXpendable Bathythermographs (AXBT's)**
Cloud Microphysics and Aerosol:	• Gas phase measurements (CO, CO2, CH4, Fast O3) for tracking air mass composition changes. • Basic aerosol size and number concentration measuring instruments (CN counter, PCASP wing-mounted) • Standard *in situ cloud particle probes (FSSP-100, FSSP-300, SD-C, and 2D-P)* • *In situ instruments for high-resolution measurements of small ice and other hydrometeors (SID-2H) and for high-resolution*
	Radiometric SST

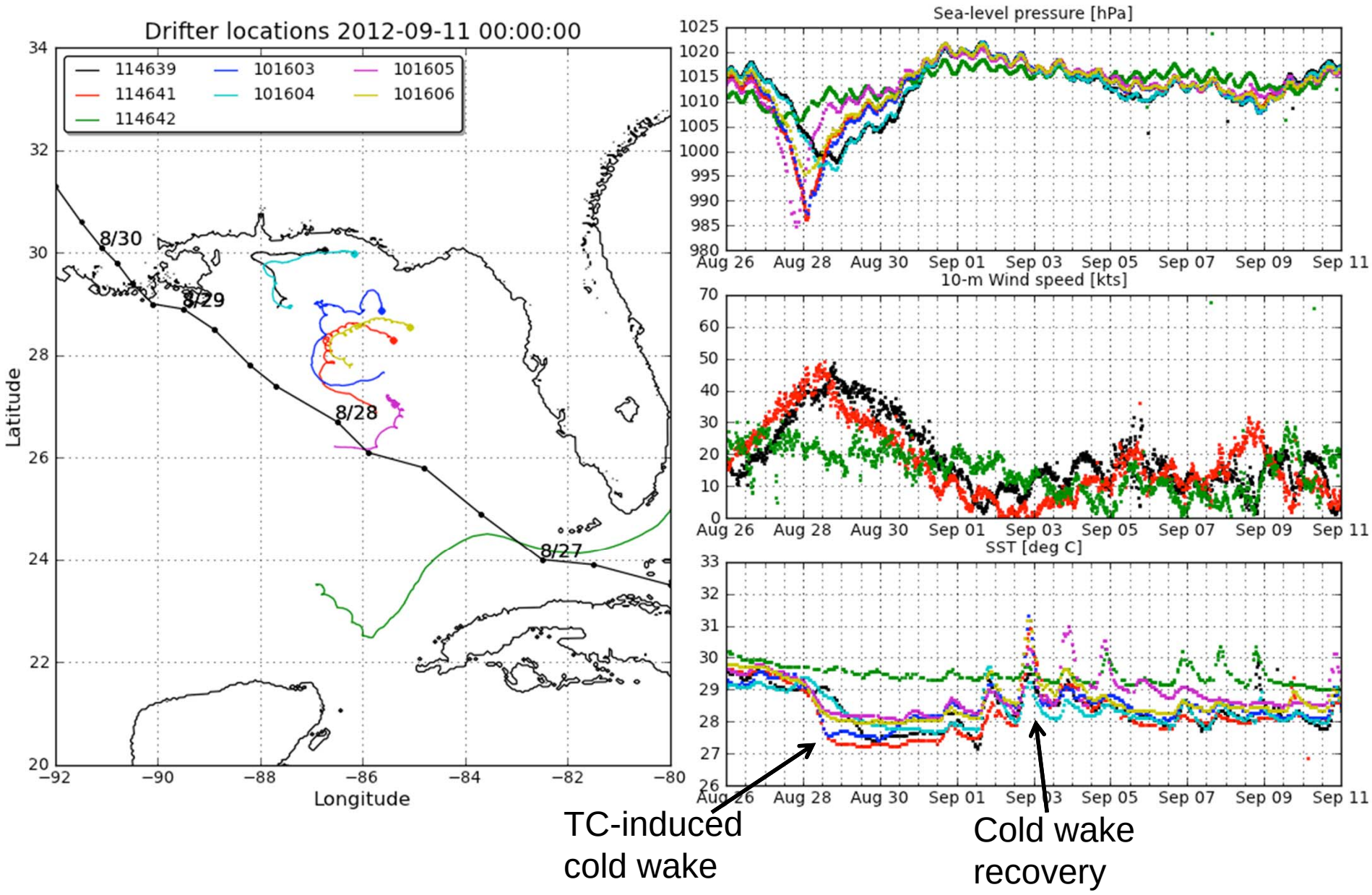

MJO
Monsoon
MCS
Night-Morning
Afternoon
Latent and
sensible fluxes
wind
Advection
Tides
Wind- and Buoyancy-
Driven Mixing

Atmospheric and Upper Ocean Temp Profiles

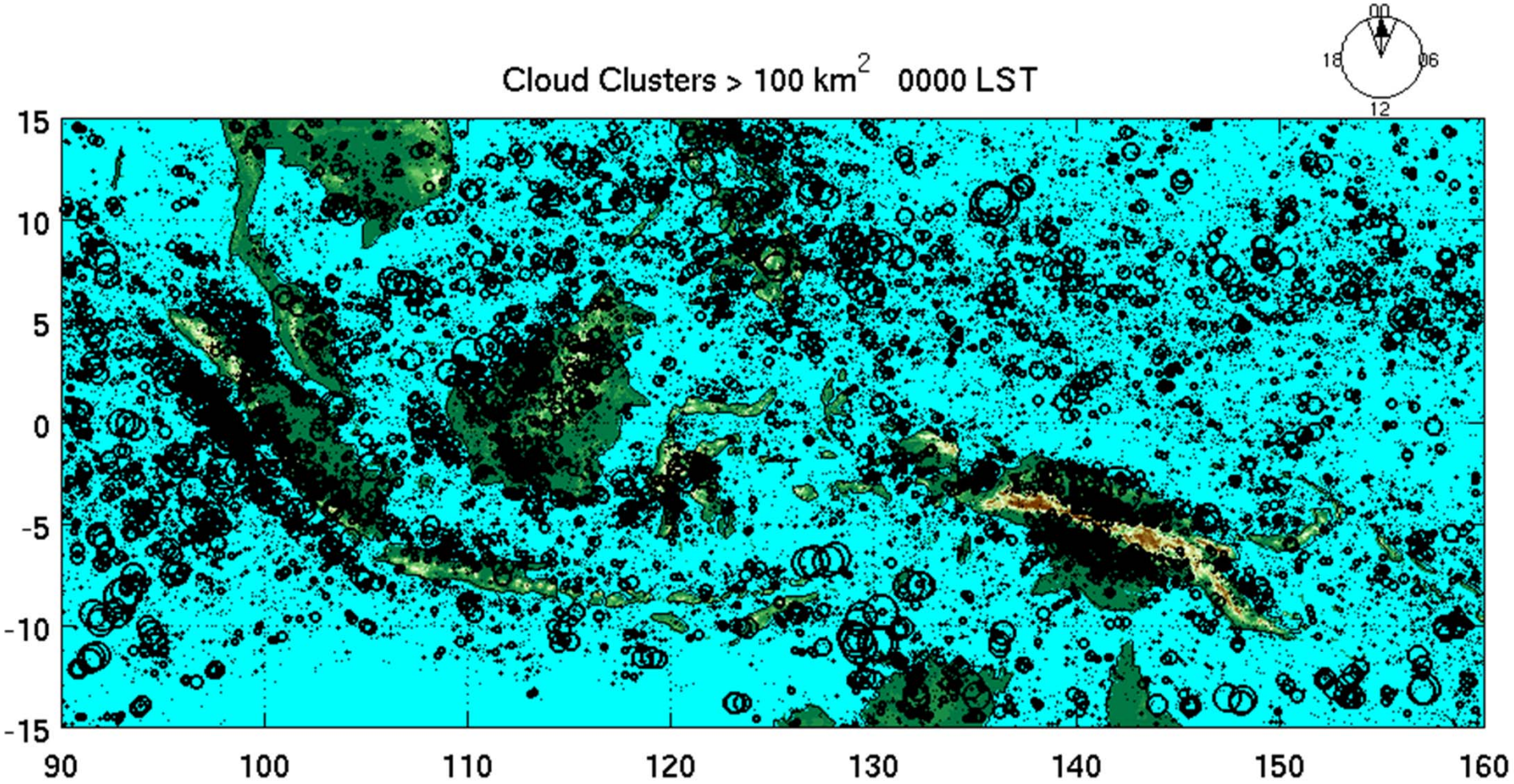


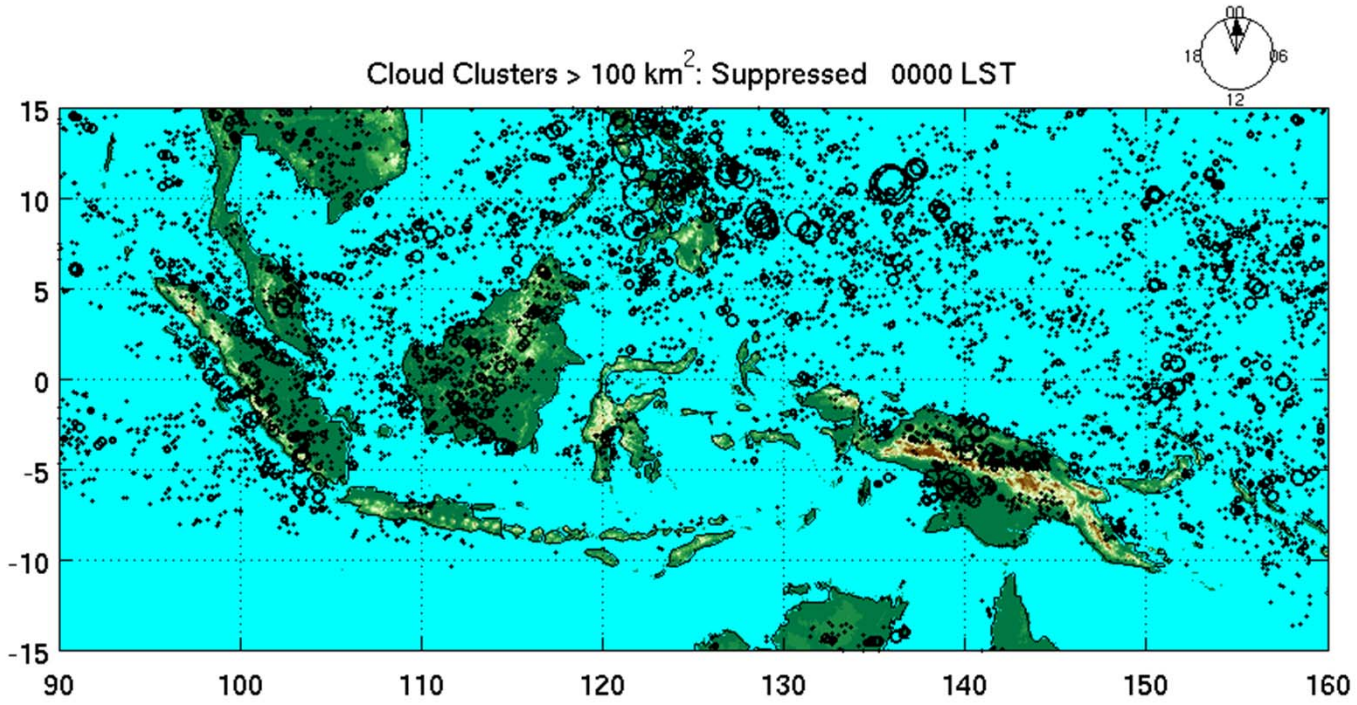


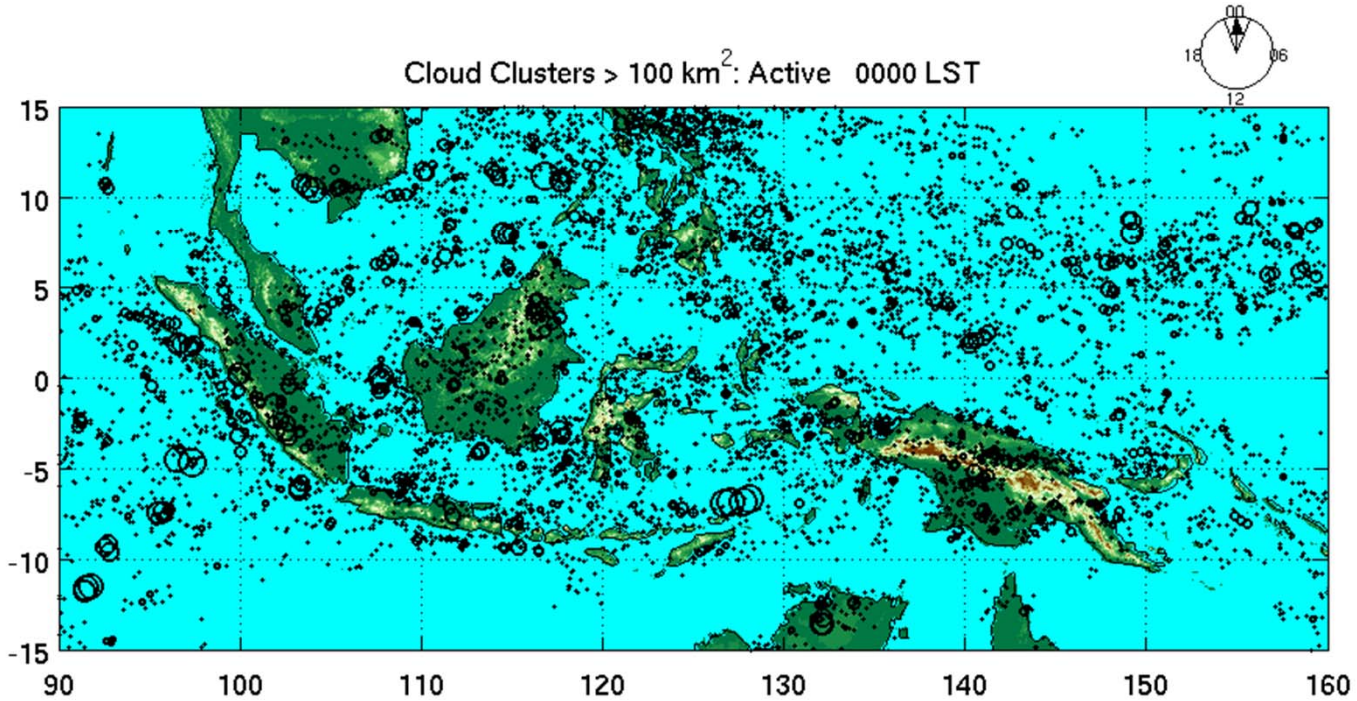
GLAD MiniMet (3) & SVPB (4) Drifters



MeteoSat7 & MDSat Cloud Clusters (IR < 208 K, hourly, Oct-Dec 2011)




Cloud Clusters > 100 km^2: Suppressed 0000 LST
00
06
12
18
15
10
5
0
-5
-10
-15
90
100
110
120
130
140
150
160


Cloud Clusters > 100 km^2: Active 0000 LST
00
06
12
18
15
10
5
0
-5
-10
-15
90
100
110
120
130
140
150
160