

TWP-ICE Meeting
November 2004

An overview of Wet Season Forecasting in the Northern Territory

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Forecasting Centre

Australian Government Bureau of Meteorology

- Day 1. Monday Nov. 15, 2004
- Session 1. Science Overview, forecast issues and satellites (Chair Jim Mather)
- 830 Welcome Jim Arthur (Regional Director, Forecast Office)
- 835 Welcome, aims of meeting Tom Ackerman (PNNL, ARM)
- 845 Science goals overview Peter May (BMRC)
- Eric Jensen (NASA)
- Cornelius Schiller (SCOUT)
- 915 The Australian monsoon Peter May (BMRC)
- Sam Cleland (NTRO)
- 945 Weather forecasting in Darwin during the wet season:
- Techniques and performance Lori Chappel (NTRO, BoM)
- Tools available for forecasting Lori Chappel
- 1015 MORNING TEA
- 1045 Discussion of forecast issues and meteorology led by Ed Zipser
- Forecasting setup for the experiment – Chappel/Jakob
- What ECMWF products are required?
- Tools – radar, satellite, NWP displays, soundings
- Briefings – Times, location, content – what is required?

An overview of Wet Season Forecasting in the Northern Territory

- Functions of the NT region;
- Weather expectations;
- Tropical forecasting tools;
- Forecast performance;

Overview of Northern Territory Regional Office - Darwin

- RSMC – Regional Specialised Meteorological Centre
- RFC – Regional Forecasting Centre
- Volcanic Ash Advisory Centre
- Severe Weather Section
- Climate Section

Climate Section

- Weekly Tropical Climate Note – expertise in MJO interpretation, easterly waves
- Climate forecasts are woven into forecasting policy
- Darwin Tropical Diagnostic Statement

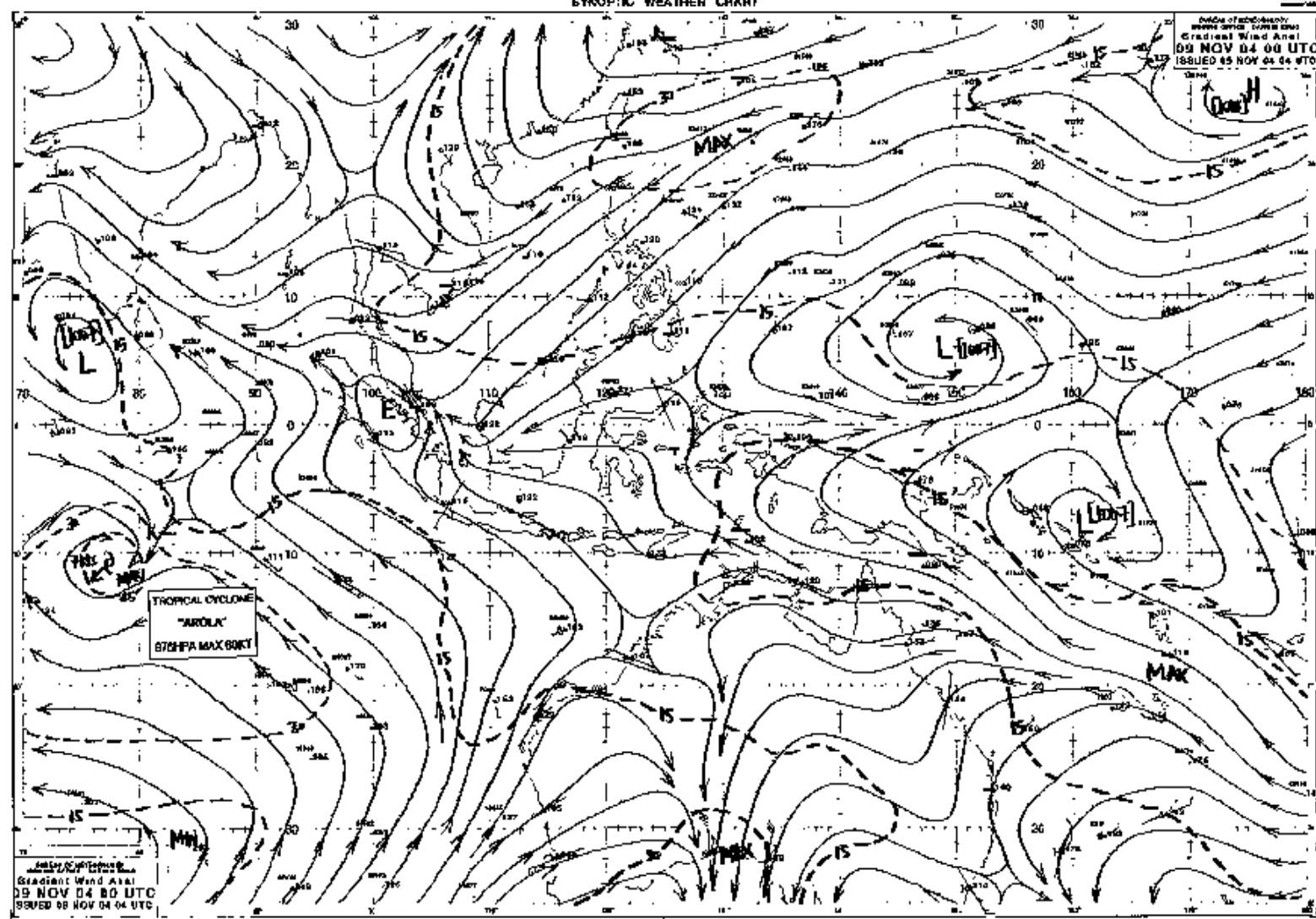
RSMC

- Area of coverage 70-180E, 25N-25S
- Products
 - hand drawn analysis – gradient level and 200 hPa
 - current warnings – TC and gale
 - TC paobs for models
- TLAPS products (TXLAPS)

SYNOPTIC WEATHER CHART

1000
1000

Division of Meteorology
Weather Service, Bureau of
Gradient Wind Anal.
09 NOV 04 00 UTC
ISSUED 05 NOV 04 04 UTC



Division of Meteorology
Weather Service, Bureau of
Gradient Wind Anal.
09 NOV 04 00 UTC
ISSUED 05 NOV 04 04 UTC

Bureau of Meteorology

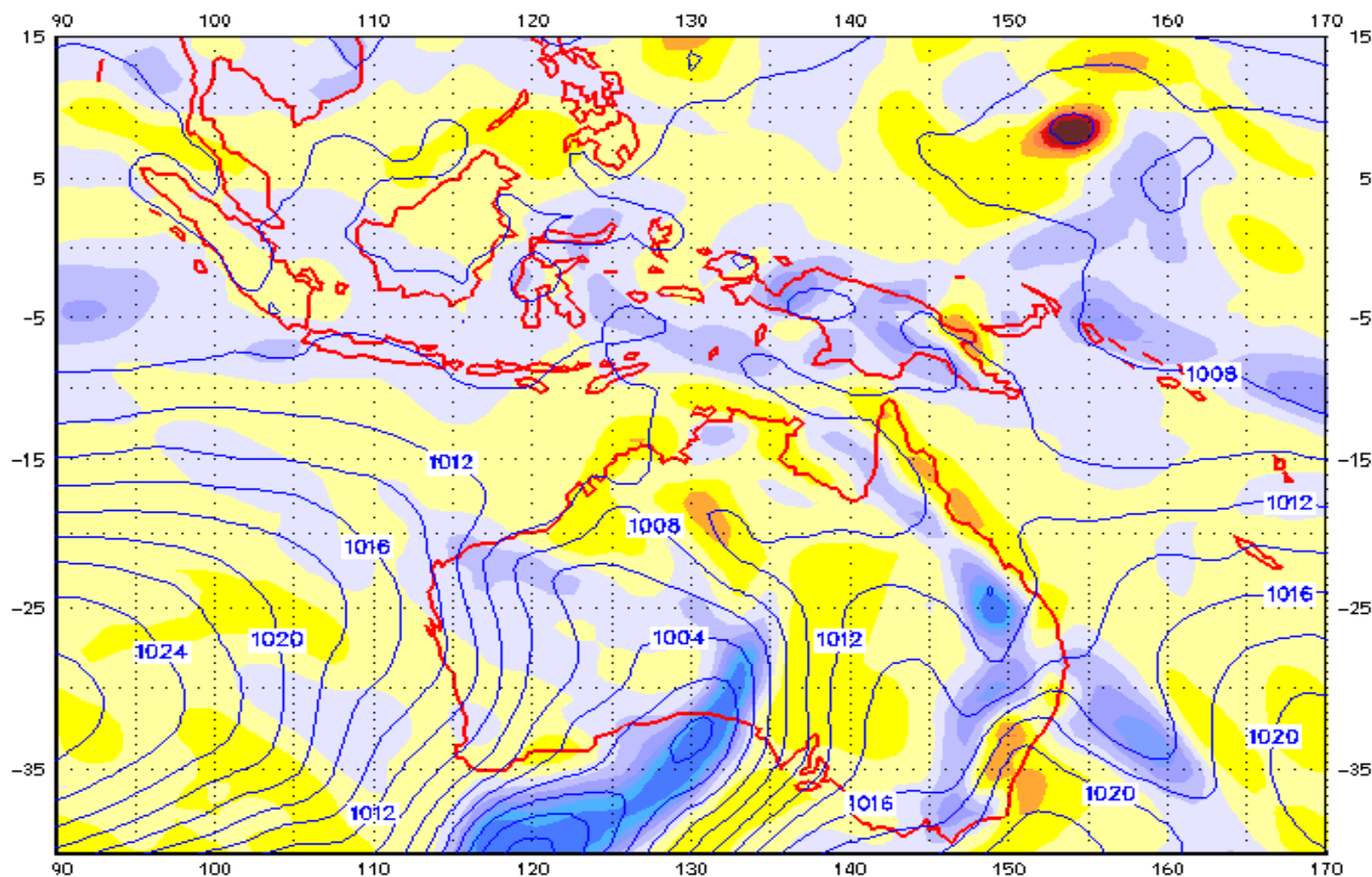
TXLAPS system

ANALYSIS

VALID 1200 UTC Tue 9 NOV 2004

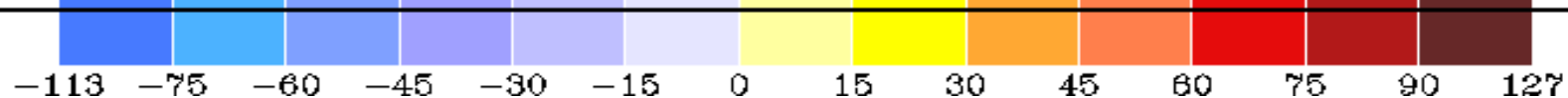
VOR

900 hPa



Units: s^{-1}

ISSUED: 18UTC 09 Nov 2004



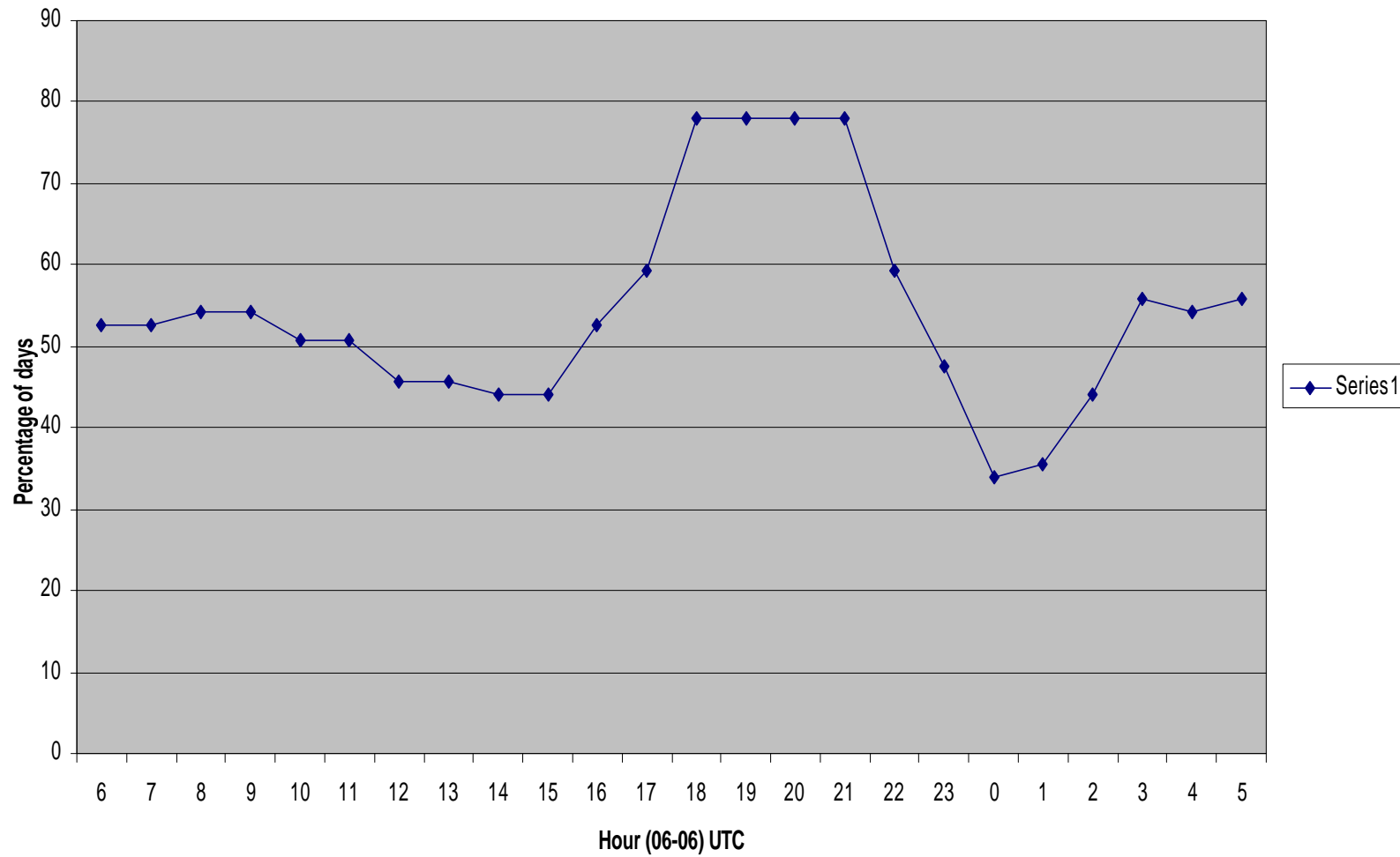
Darwin Regional Forecasting Centre (RFC)

- Aviation, Marine and Public Weather forecasts for Northern Territory (and some WA Kimberly);
- 24 hour coverage;
- ½ hrly TTF (trend type forecast) for Darwin Airport 5am – 9pm;
- Conservative TAF policy during the wet – pick the certain good weather breaks
- 7am forecasting and shift handover – ideal for daily briefing

YPDN TAF holding - 0606



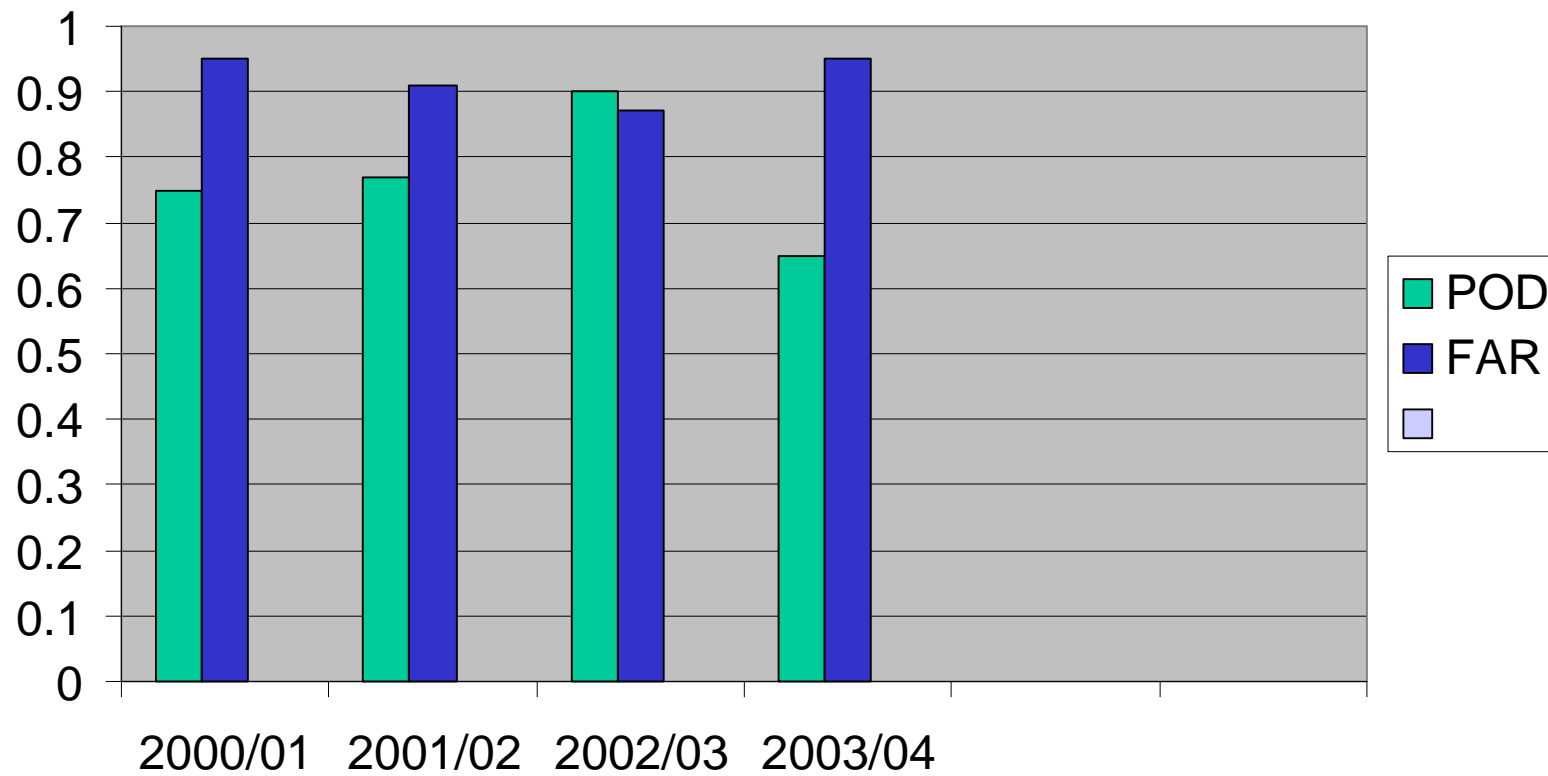
Percentage of days with holding at each hour
YPDN TAF 06-06
January and February 2004



YPDN TAF

- 13/24 hours average holding Jan/Feb 04 (06-06)
- Peak holding period 3-7am

YPDN TAF



Darwin Airport – Climate Statistics

Month	Max Temp	Min Temp	Rain Days	Rain average (mm)	Days with Fog	Days with thunder
Jan/Feb	31.5	24.8	41	423/361	Nil/0.1	19

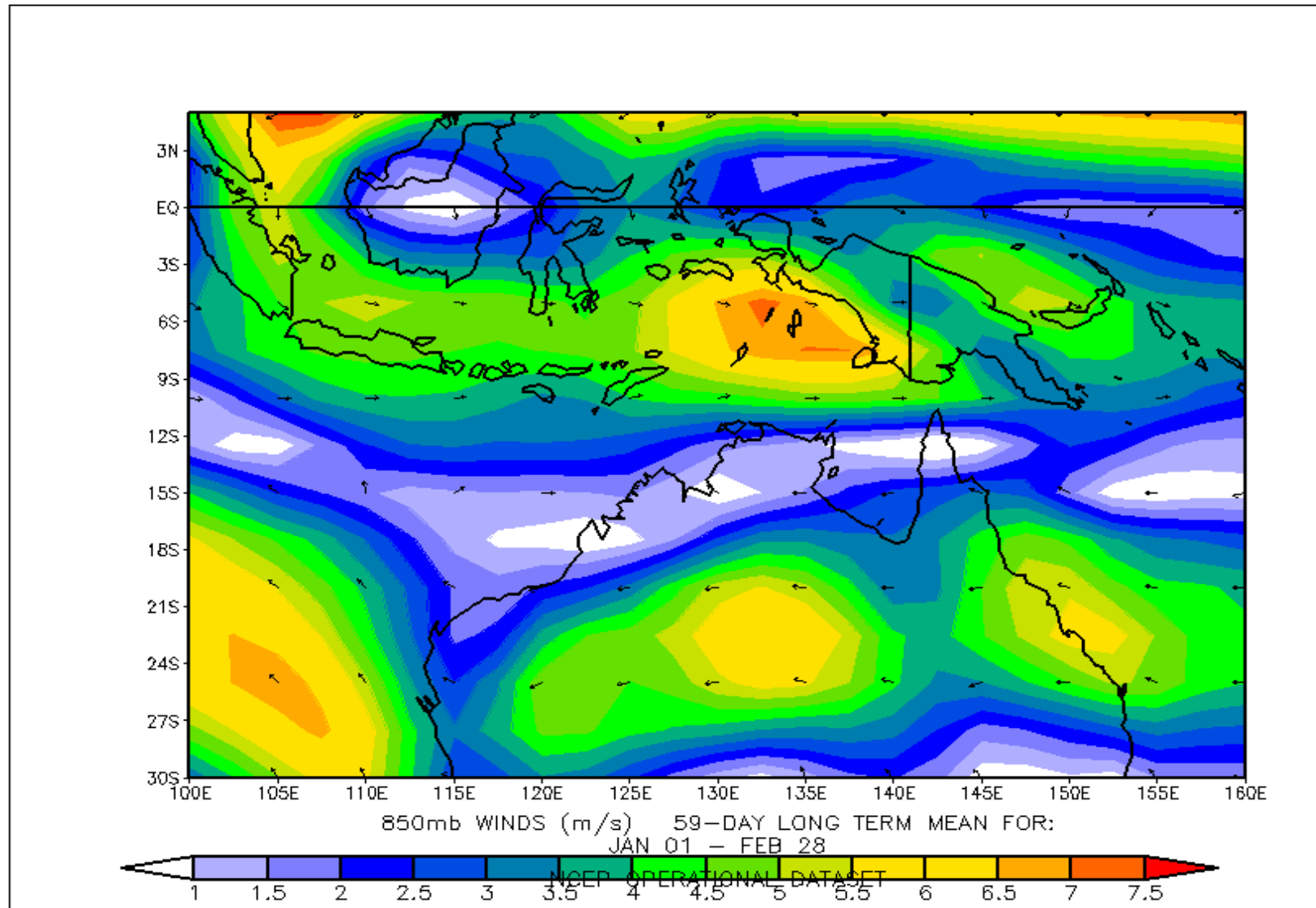
Darwin Airport Alternate Minima

YPDN – Elevation 103ft

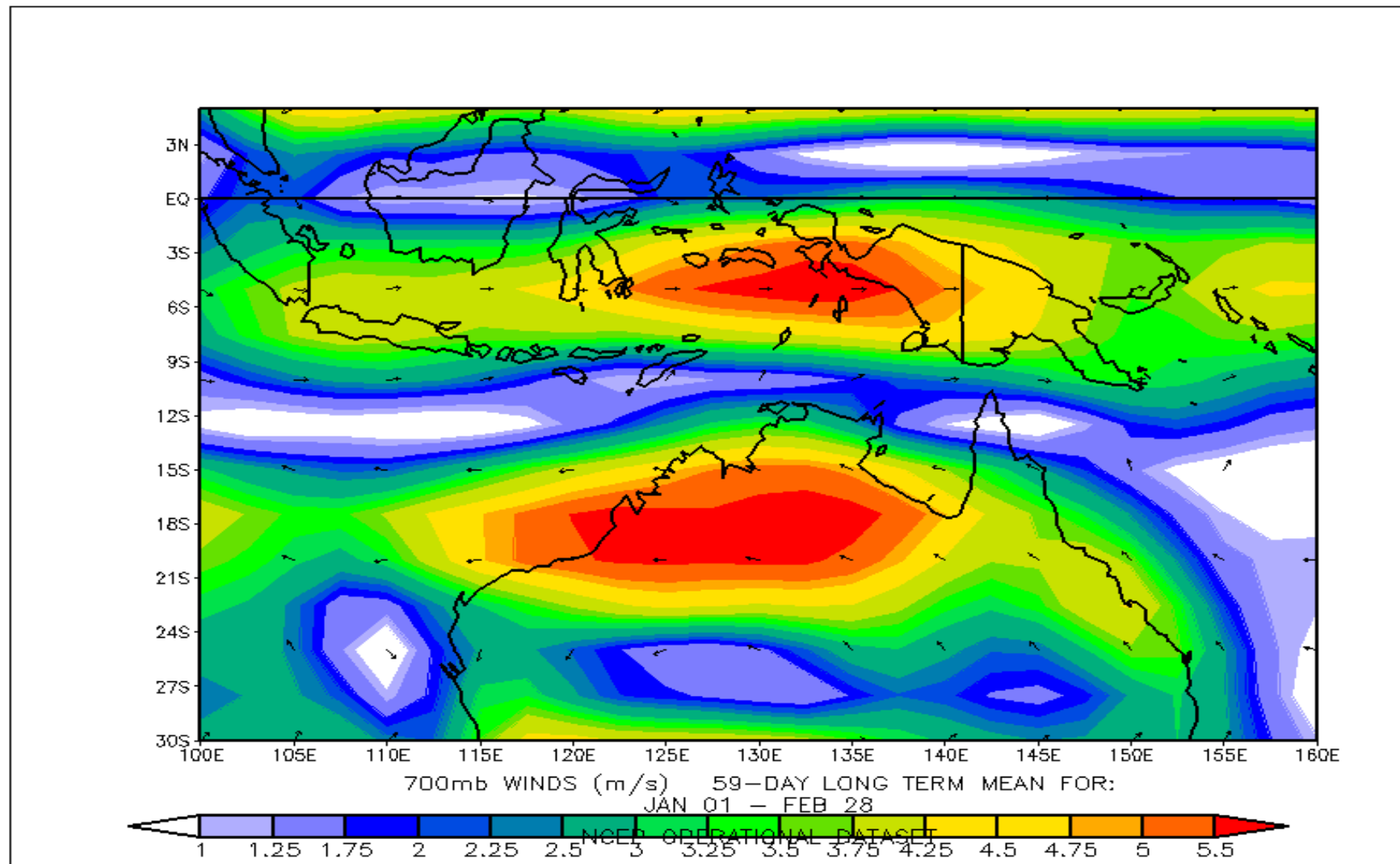
Nav aids – VOR,DME,GPS

Category	Special	A, B	C	D
Cloud Base(ft)	850	1047	1147	1347
Visibility (m)	4000	4400	6000	7000

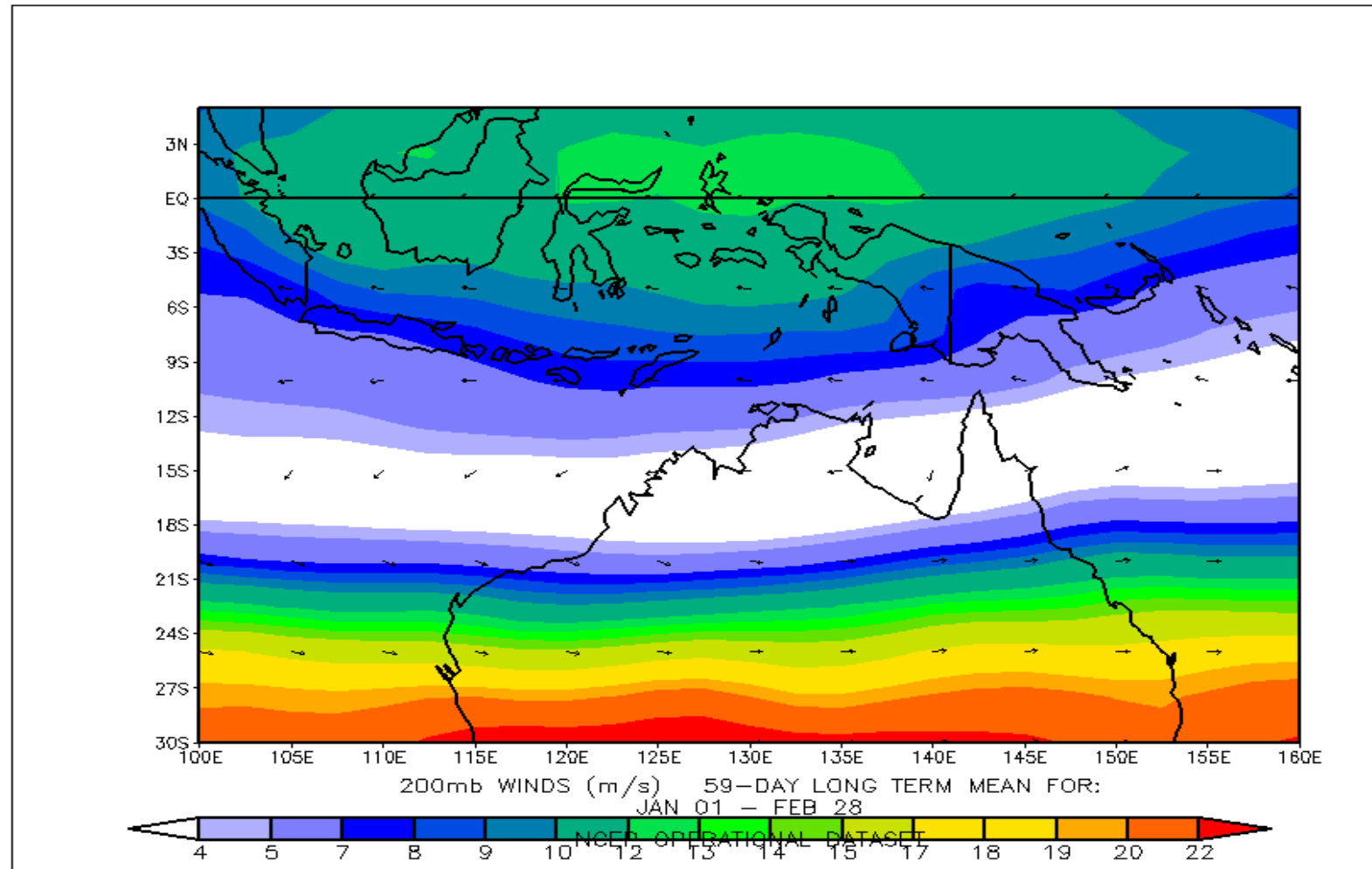
850 hPa – Jan/Feb



700 hPa – Jan/Feb



200 hPa – Jan/Feb



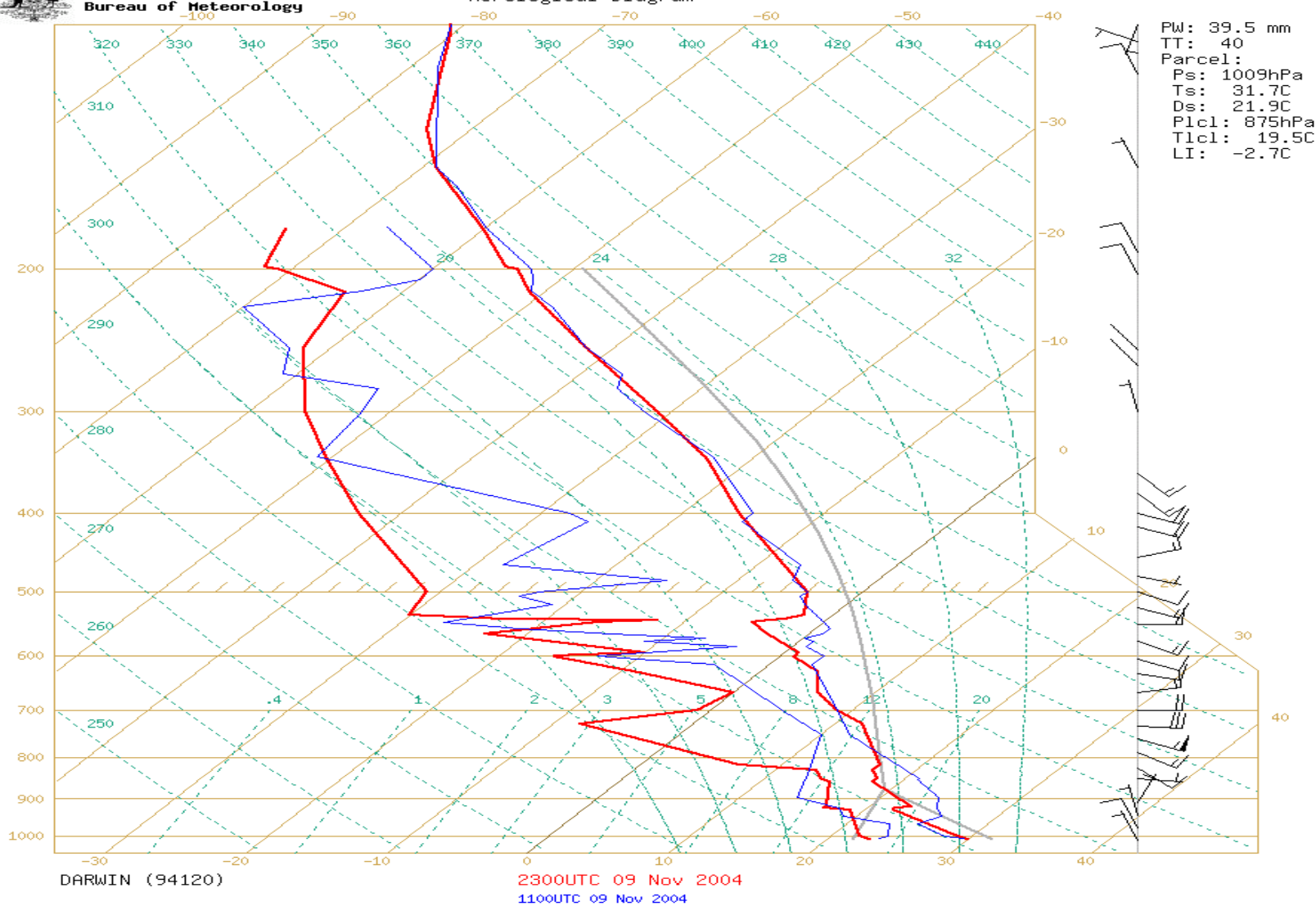
Darwin Airport observations

- Sounding twice daily 11Z, and 23Z.
- Upper winds 6 hourly;
- ½ hourly METARS over 24 hours



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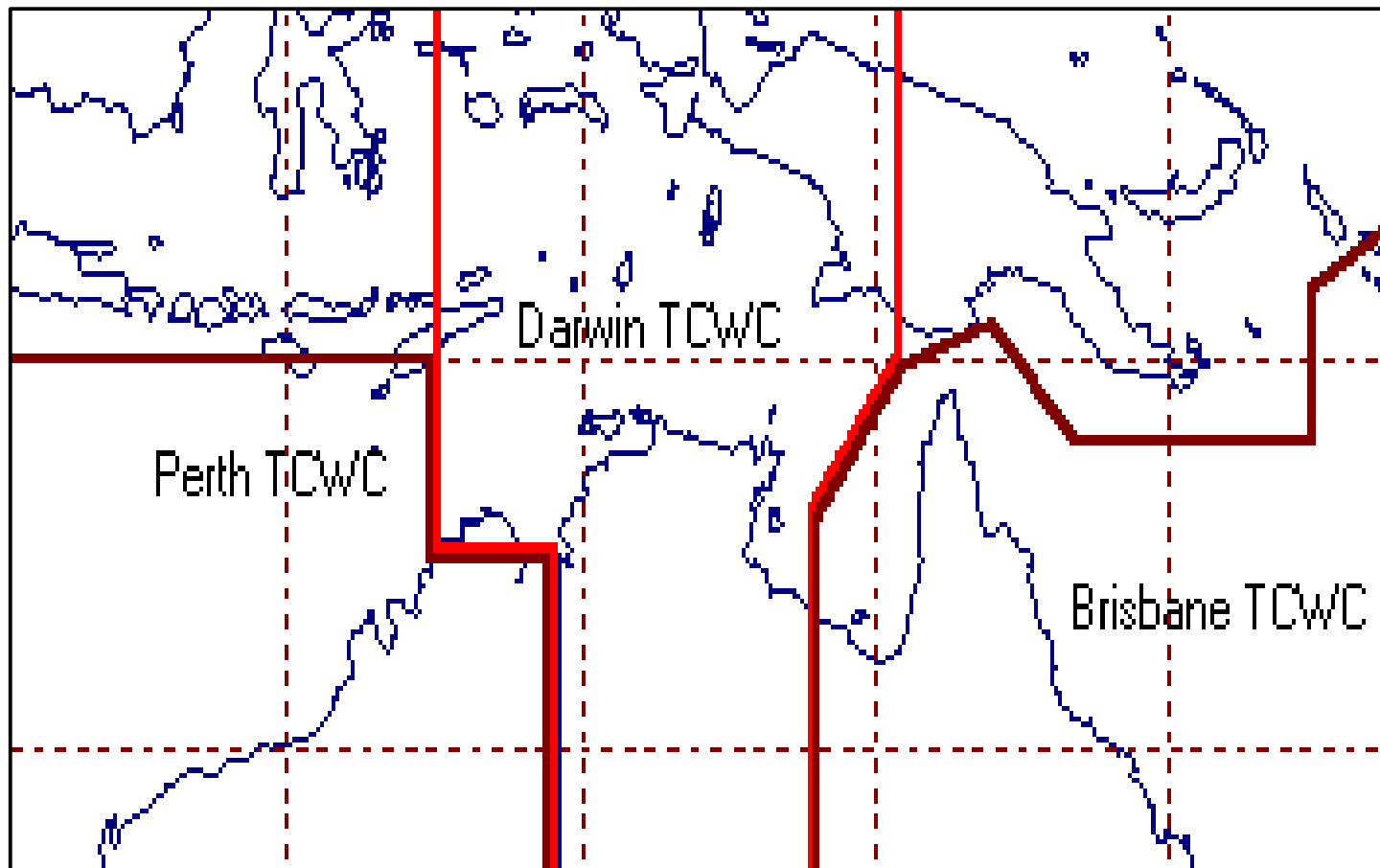
Aerological Diagram

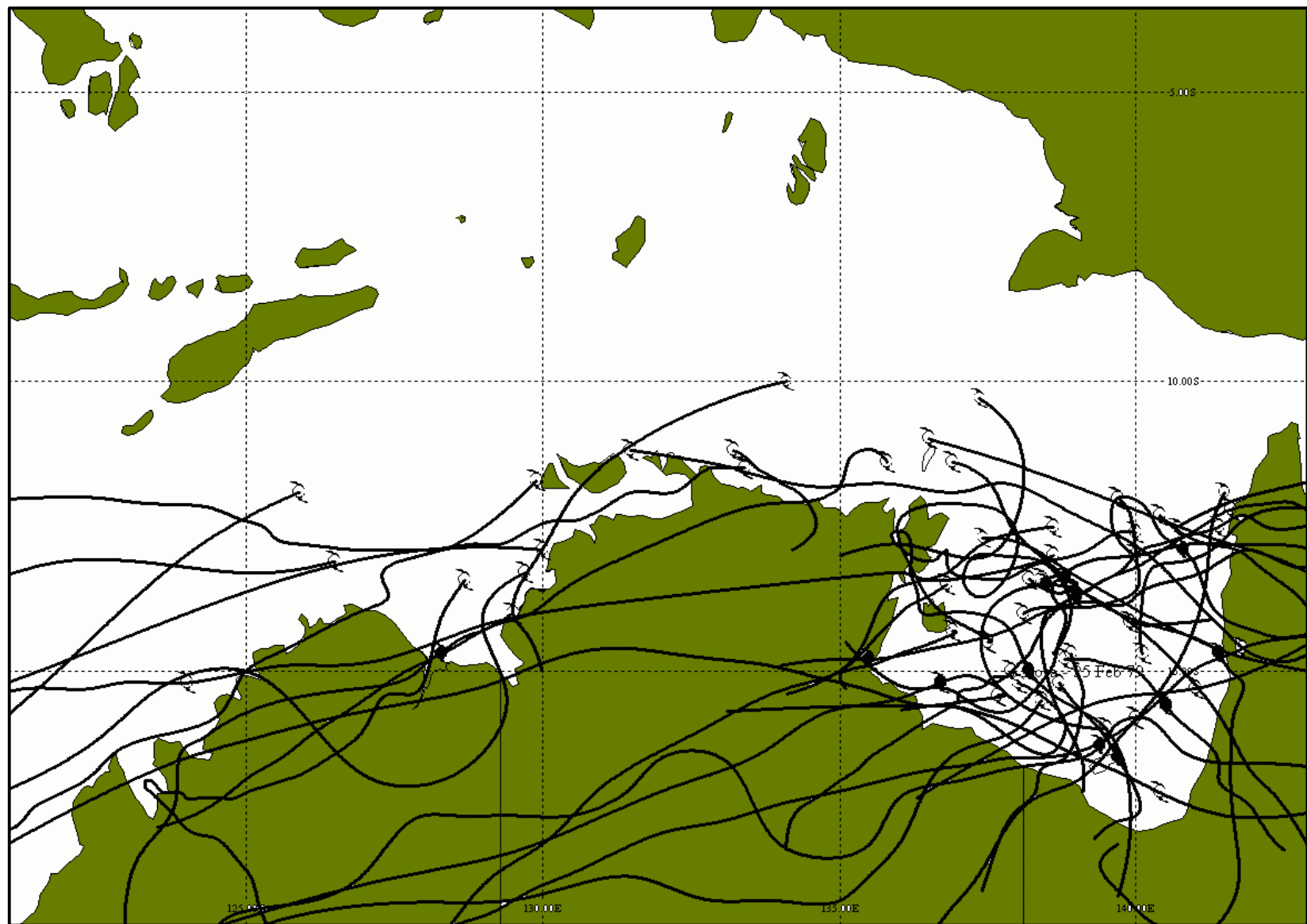


Severe Weather Section

- TCWC – tropical cyclone warning centre for Timor Sea, Arafura Sea and western Gulf of Carpentaria.
- 24 hours TC roster when required;
- Severe Storm Warning Service for Darwin area within 60km.

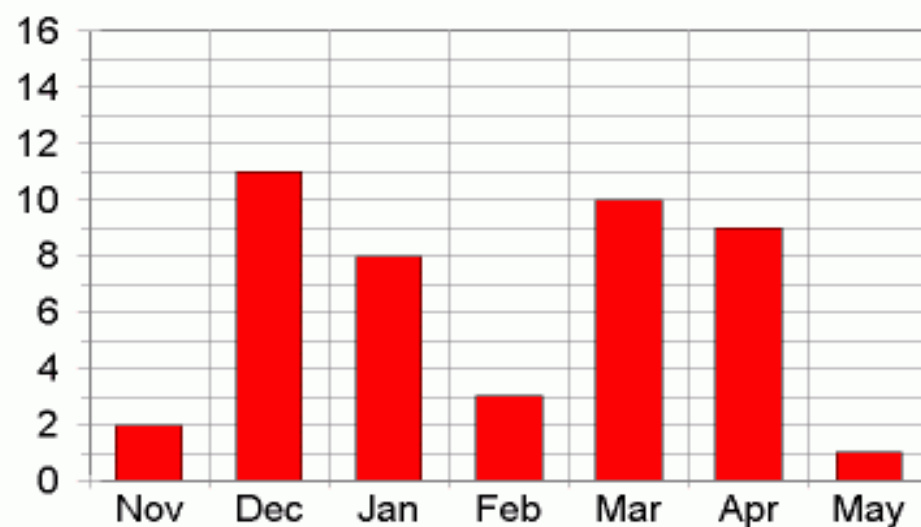
Darwin TCWC Area





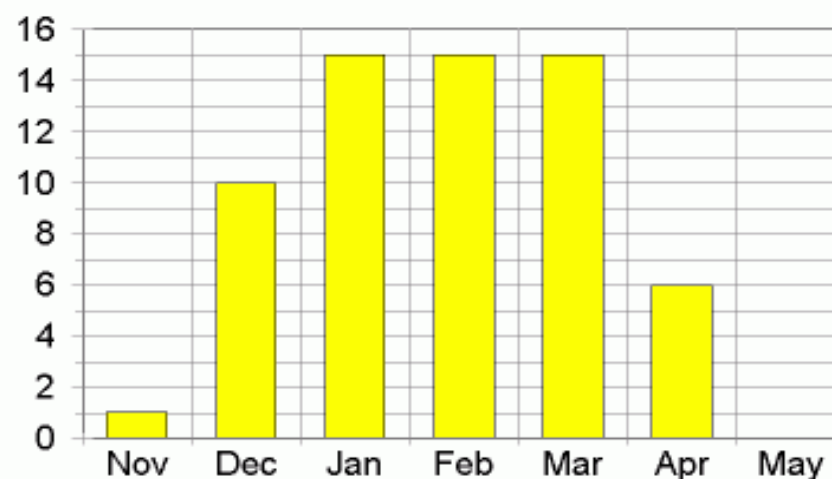
Tropical Cyclone Numbers

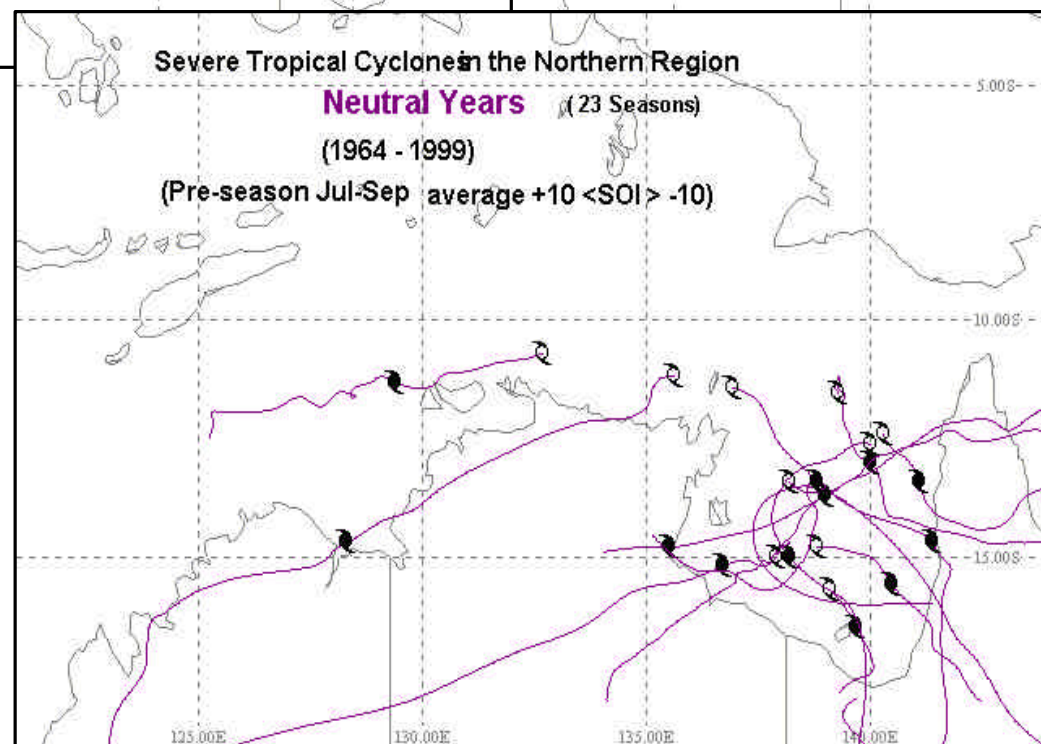
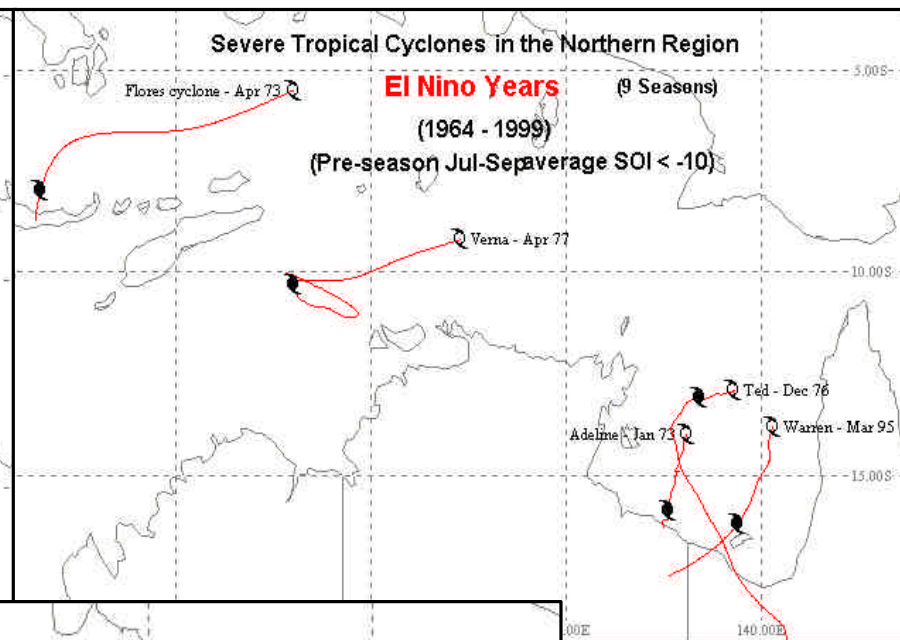
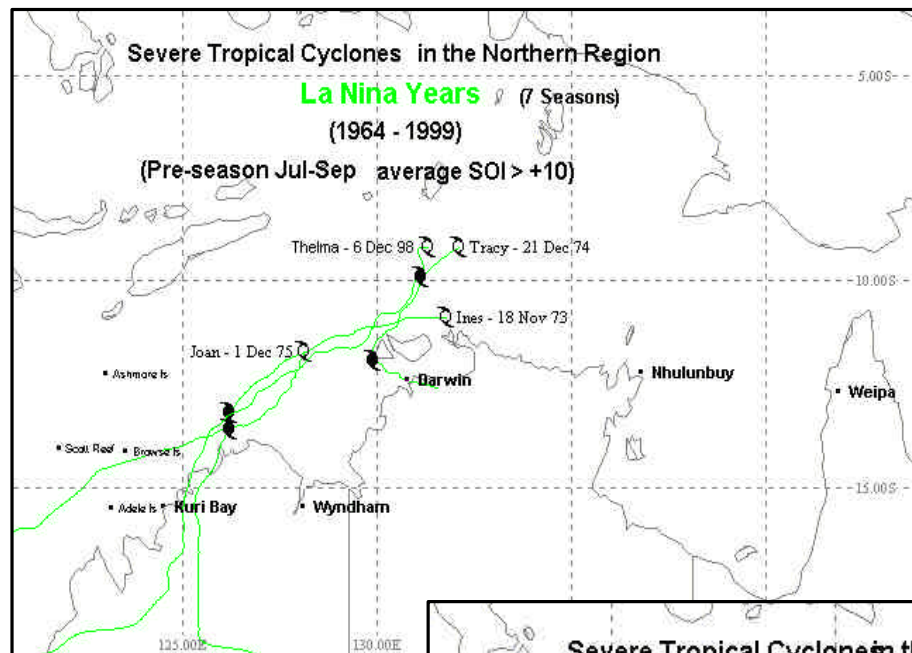
Timor and Arafura Seas (1959/98)



Tropical Cyclone Numbers

Gulf of Carpentaria (1959/98)

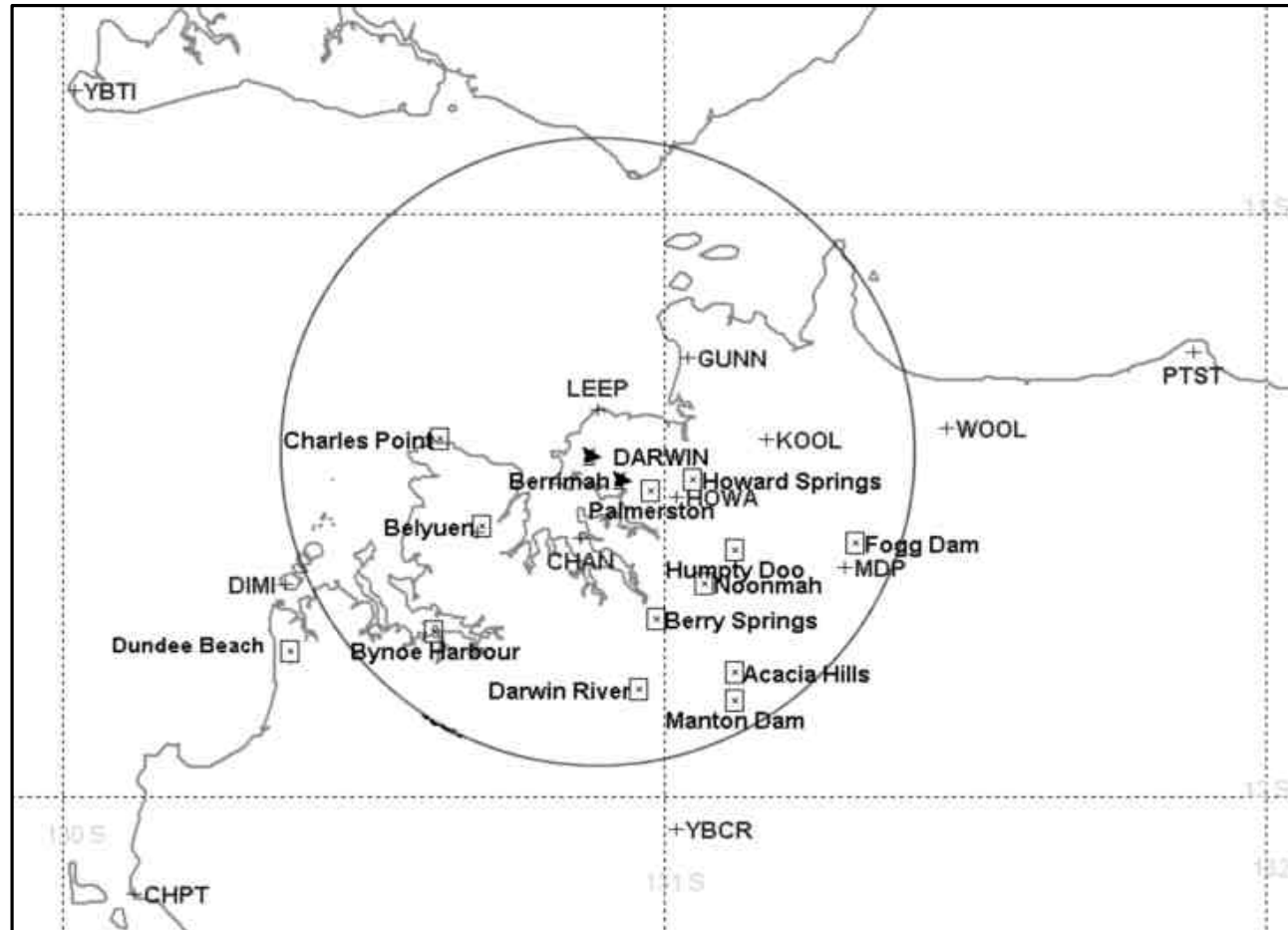




Tropical Cyclones

- Total 18 cyclones over 40 year period (1964-2004) affected Darwin and TWP-ICE experiment area (Tiwi Islands, Coburg Peninsular, eastern Timor Sea)
- Lowest TC probability month in February
- 3% probability of getting TC in area in Feb
- 8% probability of getting TC in area in Jan

Darwin Severe Thunderstorm Area

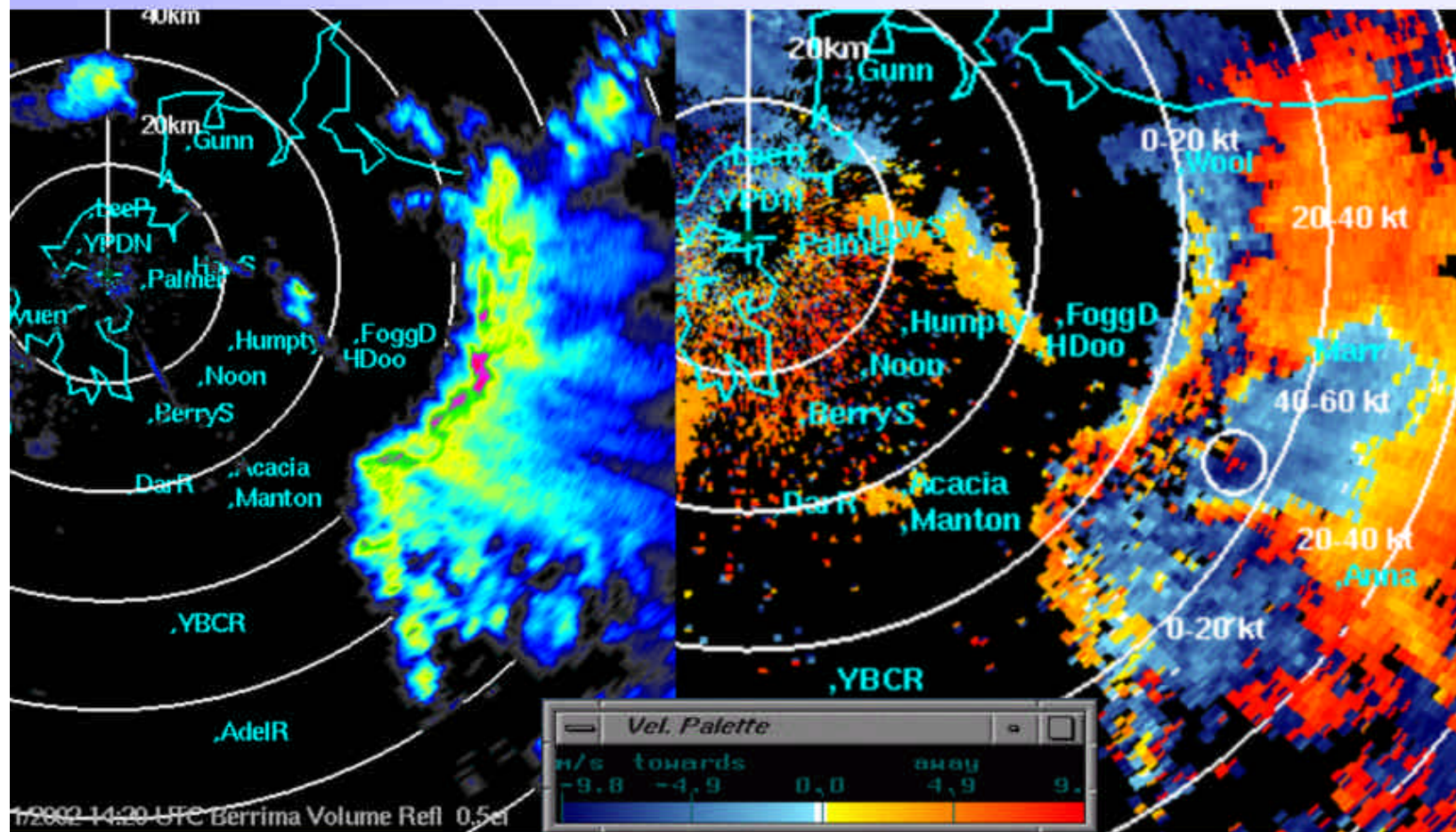


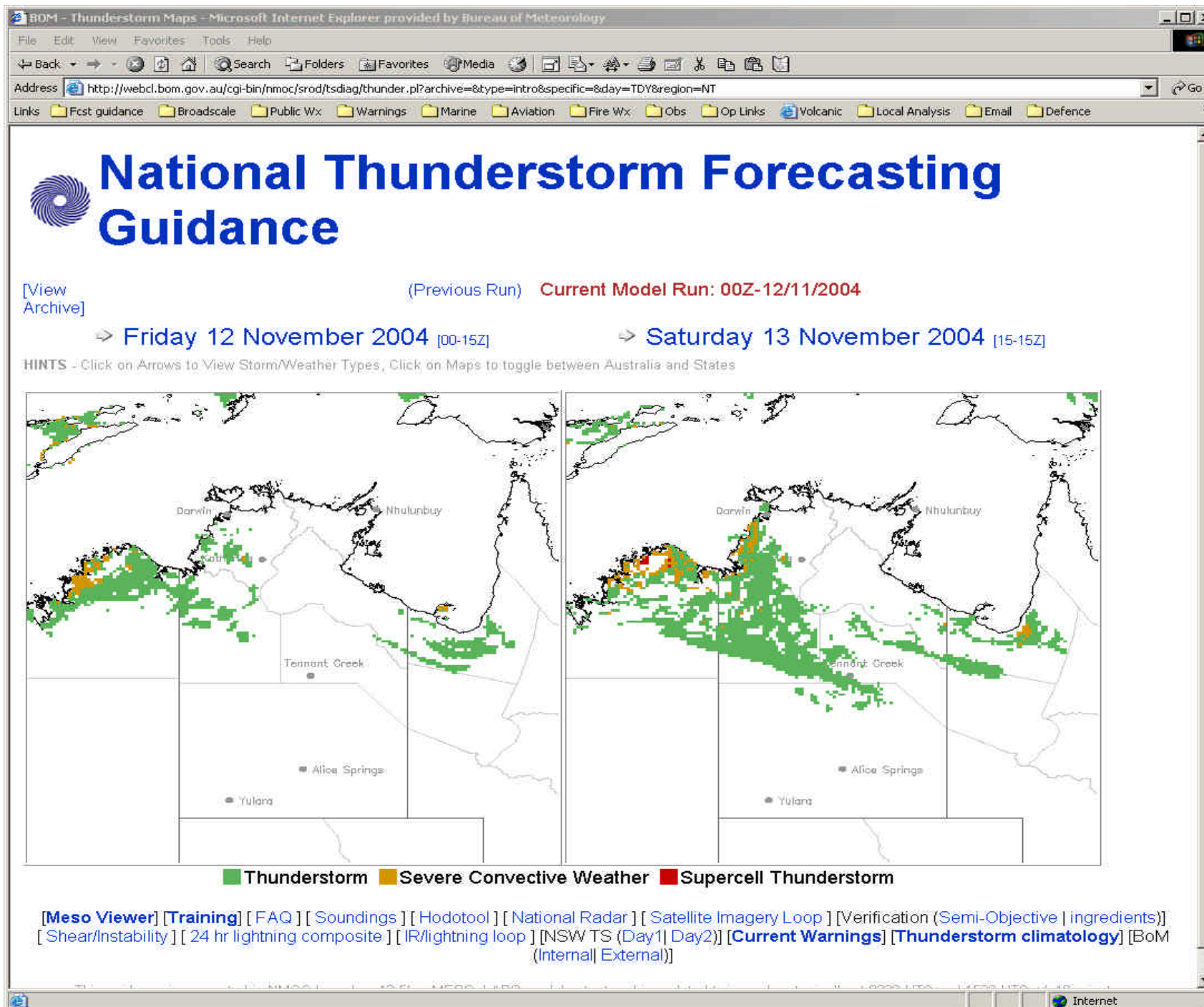
Darwin Severe Thunderstorms

- Wind gusts main severe phenomena;
- Continental Squall lines warned for – usually a couple per season ;
- Also can get severe monsoon squalls – several prone days per season,
- pulse downburst storms – up to 20 days per season – but rare on coast/airport;

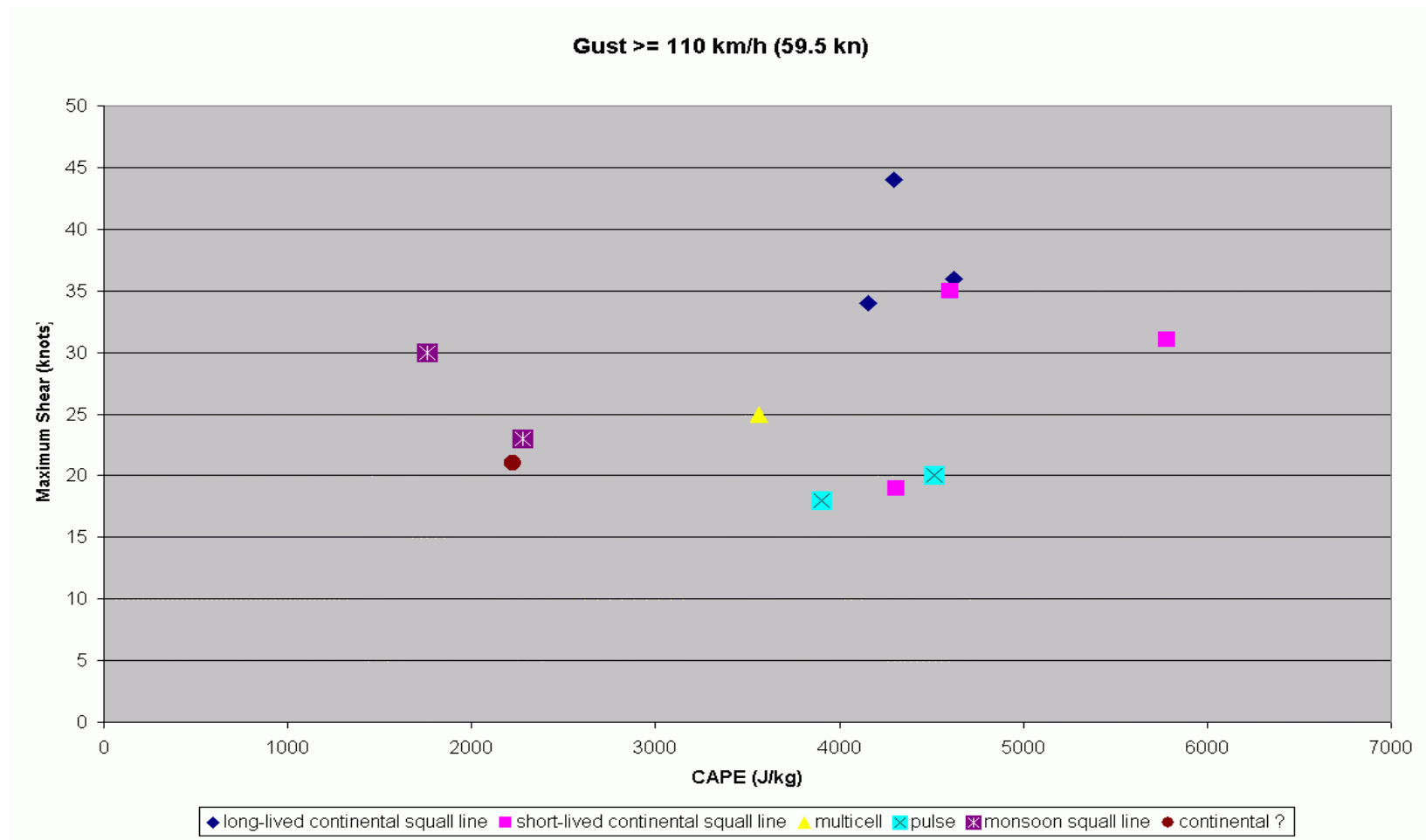
4 Nov 02 – second squall line

Berrimah PPI reflectivity and Doppler velocity 1420Z

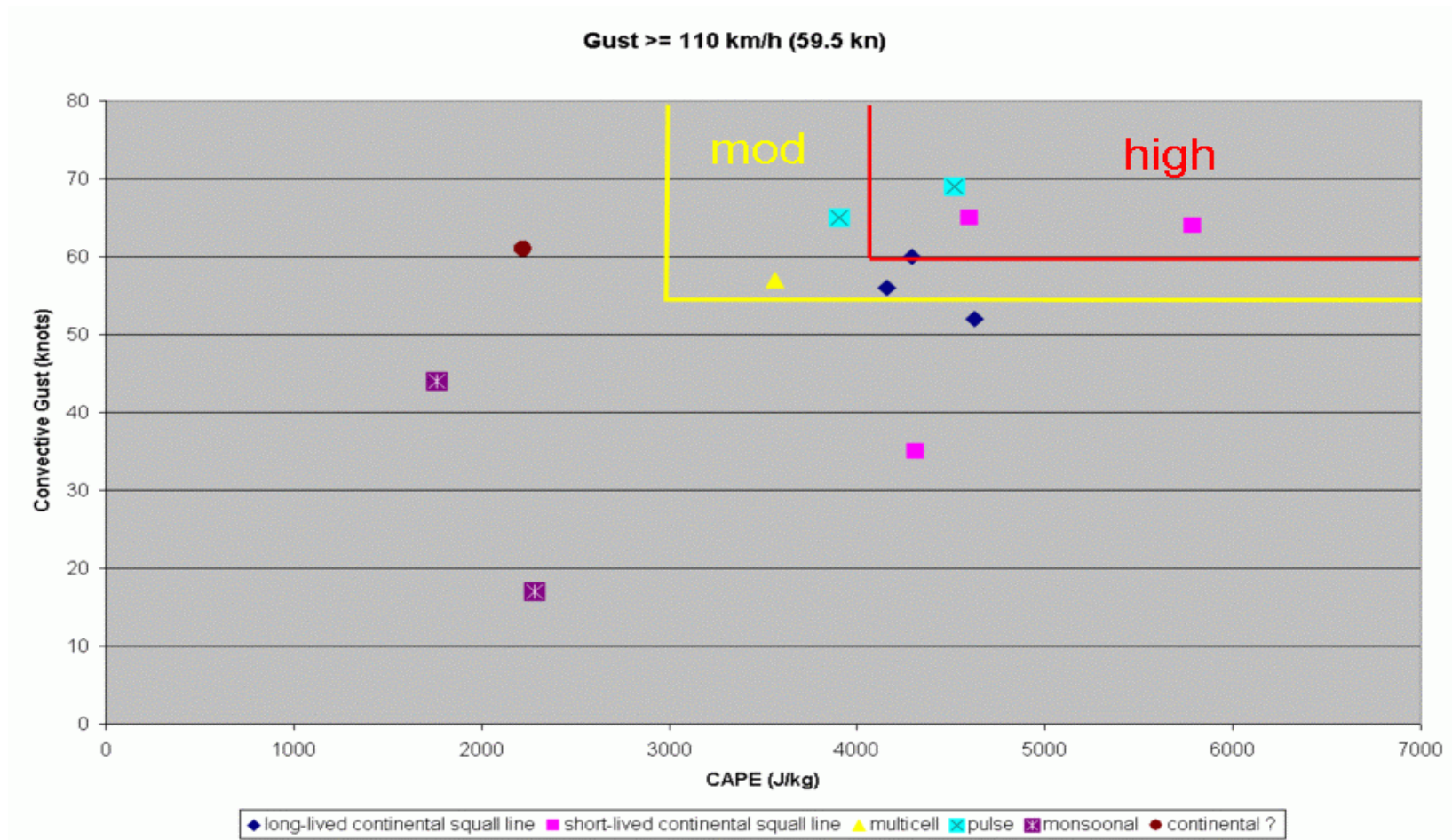




CAPE vs Shear



CAPE vs Convective Gust



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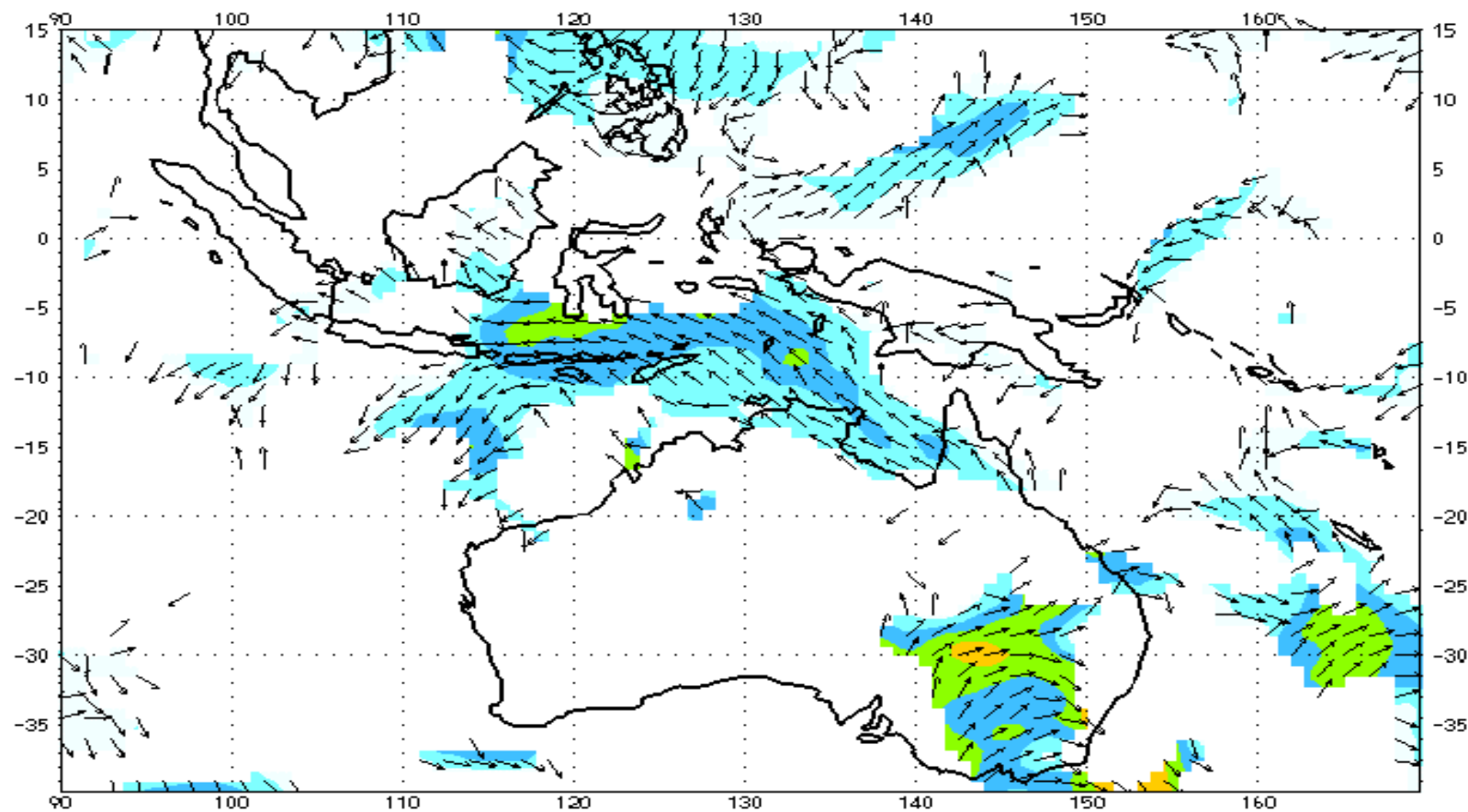
TXLAPS system

24HR FORECAST

VALID 0000 UTC Sat 13 NOV 2004

SURGE

850 hPa



Units: kts

ISSUED: 05UTC

12 Nov 2004



Forecasting tools

- Monsoon on-set < 1 week forecast
 - MJO and easterly waves
 - NWP wind/surge, moisture and vorticity fields;
 - Satellite imagery;
- Break Season
 - Convective Analysis
 - NTFGS - National Thunderstorm Forecasting Guidance
 - MesoLAPS NWP – 5km
 - TITAN, WDSS

Forecasting tools

- Extra-tropical interactions – mid-lat troughs
– surges in the easterlies
- Water Vapour imagery – dry air/ upper
trough

Spin-offs for Tropical Forecasting

- Will extra observations and soundings improve model performance and forecasting in the tropics?
 - In particular moisture field;
- Aim to improve 0-6/12 hour forecasting ability (convection).