

Introduction

- Model Output Location Time Series (MOLTS)
 - available from 5 models for EOP3
 - NCEP, UKMO, JMA, MSC, BMRC
 - 3 hourly time resolution
- Basic surface variables
 - surface pressure, screen level temperature
 - screen level humidity
 - 10m winds

Diurnal Binning

- Simplest way to analyse the diurnal part
 - sort the series into daily time bins representing the diurnal cycle
 - assumes
 - that the non-diurnal behaviour is random
 - diurnal behaviour itself is invariant over the total time of the series
- * certainly not correct for strong seasonal behaviour*

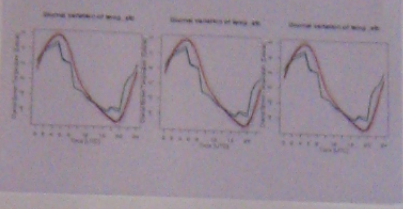
Comments on Diurnal Binning

- shows sensitivity to the presence of model spin-up
 - forecasts are explicitly 'tied' to the analysis series every 6 hours
 - can add harmonics which confuse the interpretation

The diurnal variation (relative to each mean) of screen level temperature and specific humidity and 10m wind speed for the stations in the Murray Darling Basin.

The different MOD sites are plotted in grey with Kyrenalla (the site closest to the BMRC model's MOLTS point) in black. The mean MOD results are in red and the model is green (the analysis cycle) and blue (the 12-36 hour forecast cycle).

Murray Darling Basin Diurnal Variation

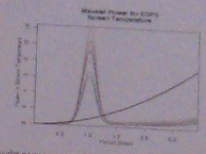


Wavelet Analysis

- perform a wavelet analysis and filter on diurnal time scales
- statistical tests (e.g. Torrence and Compo 1998) allows the isolation of time periods when the diurnal strength is large and significant.

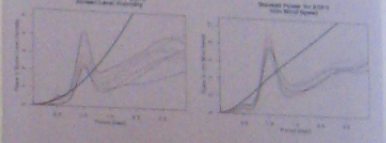
Torrence, C. and G.P. Compo, 1998: A Practical Guide to Wavelet Analysis. Bull. Amer. Meteor. Soc., 79, 61-78.

Diurnal Power in the MDB

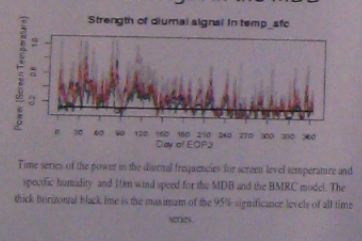


The wavelet power spectra of screen temperature and specific humidity and 10m wind speed in the diurnal spectral region. The solid black line is the maximum of the 95% significance levels of all time series. All other lines are as for previous MDB plots.

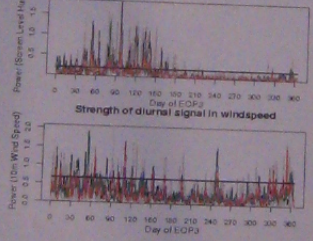
Diurnal Power in the MDB (cont)



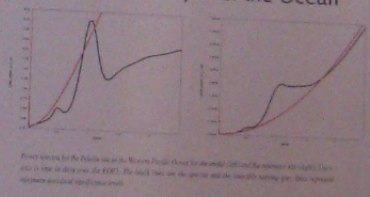
Diurnal Strength in the MDB



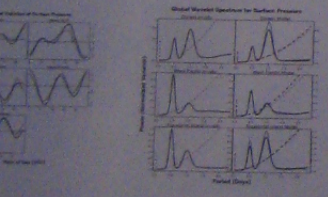
Strength of diurnal signal in hum_sfc



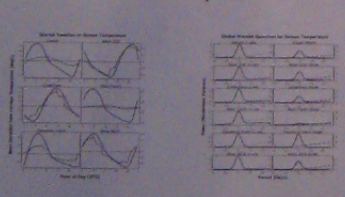
Surface Humidity over the Ocean



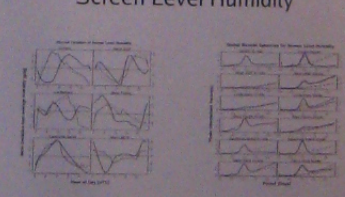
Surface pressure



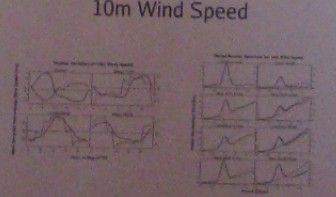
Screen Temperature



Screen Level Humidity



10m Wind Speed



Validation of the BMRC MOLTS

- Hourly model and insitu data
- Limited to 5 sites
 - ARM_Southern Great Plains, ARM_Darwin
 - Murray Darling Basin, Equatorial Island
 - Western Pacific (nominally an ocean site)
- Project expanded to include other models and 10 more insitu datasets.

Precipitation

