

Bureau of Meteorology

**Map Browser Reference
Manual**

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Map Browser Reference Manual, version 2.0

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Introduction

Map Browser is an interactive (GUI-based) application that is used view archived grids (e.g. NCEP re-analysis dataset), tropical cyclones, synoptic types (e.g. Treloar and Stern, 1993) and weather variables (e.g. heat wave).

Map Browser features include the:

- Display of an extensive archive of mean sea level pressure (MSLP) analyses from the BoM's METANAL and NCEP re-analysis datasets;
- Display of synoptic type data from the Synoptic Typer and other synoptic classification schemes, including calculation of the mean field and frequency analysis of weather variables for each synoptic type;
- Display of position of any historical tropical cyclone in the Australian region.

This document describes the Map Browser application from a system perspective and is designed for meteorologists and information technology officers.

The Map Browser system has been developed on the PC (Windows), and implemented in Windows, Linux and UNIX (e.g. *servb.ho.bom.gov.au*).

This document describes the Map Browser work in progress.

Design Philosophy

Map Browser is written in the cross-platform, IDL programming language using the latest available version (i.e. IDL 5.5). IDL can be used in an interpretive mode or pseudo-compiled mode.

- In interpretive mode, the IDL interpreter compiles source code files as required and then internally executes the result. An IDL development license is required.
- In pseudo-compiled mode, the IDL source files are pre-compiled (e.g. on the PC) into an XDR (external data representation) format, which is then saved to a file (e.g. *mapbrowser.sav*). IDL can read the XDR file and execute the program immediately. An IDL run-time license is required, unless an IDL license has been embedded into the application (e.g. using IDL 5.5 on *servb.ho.bom.gov.au*).

Map Browser features can be developed and demonstrated in interactive mode (GUI-based application) on the PC (Windows or Linux) or in UNIX (e.g. *servb.ho.bom.gov.au*).

Map Browser

Map Browser is an interactive (GUI-based) application that is used view archived grids (e.g. NCEP re-analysis dataset), tropical cyclones, synoptic types (e.g. Treloar and Stern, 1993) and weather variables (e.g. heat wave).

The Map Browser system has been developed on the PC (Windows) and implemented in Windows, Linux and UNIX (e.g. *servb.ho.bom.gov.au*). The Map Browser system dataflow is presented in Figure 7 (see Appendix A).

File Location

The source code files (e.g. `mapbrowser.pro`), documentation and startup files are located in `c:\idl\mapbrowser` on the PC (Windows) and in `/aifs/dev/mapbrowser` on *servb.ho.bom.gov.au*.

Data File Formats

Map Browser reads archived grids (i.e. METANAL, NCEP, NCEP2-Global, NCEP2, NOAA-Global, NOAA and GCM) that have been re-organised into separate raw binary files for each grid field and time. Grids originally in netCDF or GRIB formats have been converted into this format for optimum performance and memory management in Map Browser.

Map Browser reads synoptic type data (e.g. date and synoptic type) in 'ST' (ASCII) format. It can import synoptic type data in CSV (ASCII) format by converting the data into 'ST' format. It can also export the synoptic type data in CSV (ASCII) format.

Map Browser reads weather variable datasets (i.e. heat wave and wave height data) organised into separate files for each variable and location. The daily and hourly data are in CSV (ASCII) format.

Map Browser reads the tropical cyclone dataset re-organised into a simple ASCII format.

Interactive Mode

Map Browser can be run in interactive mode (GUI-based) on the PC (Windows or Linux) and in UNIX.

To operate in interactive mode on the PC (Windows) click on the Map Browser icon on the desktop.

In UNIX run the Map Browser shell script (i.e. `run_mapbrowser`) located in `/aifs/dev/bin`.



Configuration File

The configuration file (i.e. `mapbrowser.cfg`) is an ASCII file and contains the startup parameters for the Map Browser system (see Table 1). It is located in the Map Browser data directory. The default configuration file for Map Browser is `c:\idl\mapbrowser\data\mapbrowser.cfg` on the PC (Windows) and `/aifs/dev/mapbrowser/data/mapbrowser.cfg` on *servb.ho.bom.gov.au*.

The following examples are typical settings for the configuration file on the PC (Windows) and in UNIX:

`; configuration file (Windows)`

```
batch=0
log=1
default_font='arial bold*14'
text_size=1.2
text_thick=2.0
contour_size=1.2
contour_thick=2.0
mapbrowser_dir='c:\idl\mapbrowser'
batch_dir='batch'
bin_dir='bin'
data_dir='data'
image_dir='image'
grid_dir='c:\'
save_dir='c:\temp'
st_dir='c:\idl\synoptictyper'
tc_dir='c:\idl\mapbrowser\tc'
var_dir='c:\idl\mapbrowser\var'
image_format='PNG'
draw_xsize=650
draw_ysize=480
no_drawing_colors=88
```

`; configuration file (UNIX)`

```
batch=0
log=1
default_font='8x13bold'
text_size=1.2
text_thick=2.0
contour_size=1.2
contour_thick=2.0
mapbrowser_dir='/aifs/dev/mapbrowser'
batch_dir='batch'
bin_dir='bin'
data_dir='data'
image_dir='image'
grid_dir='/td'
save_dir='/aifs/dev/mapbrowser/save'
st_dir='/aifs/dev/mapbrowser/st'
tc_dir='/aifs/dev/mapbrowser/tc'
var_dir='/aifs/dev/mapbrowser/var'
image_format='PNG'
draw_xsize=650
draw_ysize=480
no_drawing_colors=88
```

The format of each line of the configuration file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the `$` symbol at the end of the line. Comments can be inserted by placing the `;` symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the configuration file (i.e. specification of each variable is optional).

Table 1: Configuration options for Map Browser

Variable	Description	Default
batch	Batch (0=No, 1=Image, 2=Postscript)	0
log	Log (0=No, 1=Yes)	1
default_font	Default font	'8x13bold' (UNIX) 'arial bold*14' (Windows)
text_size	Text Size	1.2
text_thick	Text Thickness	2.0
contour_size	Contour Size	1.2
contour_thick	Contour Thickness	2.0
mapbrowser_dir	Map Browser directory	'/aifs/dev/mapbrowser' (UNIX) 'c:\idl\mapbrowser' (Windows)
batch_dir	Batch directory	'batch'
bin_dir	Bin directory	'bin'
data_dir	Data directory	'data'
image_dir	Image directory	'image'
grid_dir	Grid directory	'/td' (UNIX) 'c:\' (Windows)
save_dir	Save directory	'/tmp' (UNIX) 'c:\temp'
st_dir	Synoptic Types directory	'/td/synoptictyper' (UNIX) 'c:\idl\synoptictyper' (Windows)
tc_dir	Tropical Cyclones directory	'/td/tc' (UNIX) 'c:\tc' (Windows)
var_dir	Variable directory	'/td/var' (UNIX) 'c:\var' (Windows)
image_format	Image format	'PNG'
draw_xsize	Minimum Window Image width (pixels)	650
draw_ysize	Minimum Window Image height (pixels)	480
no_drawing_colors	Number of drawing colors	88

Color File

The color file (i.e. `mapbrowser.col`) is an ASCII file and contains the colors for the Map Browser system (see Table 2). It is located in the Map Browser data directory.

The default color file for Map Browser is

`c:\idl\mapbrowser\data\mapbrowser.col` on the PC (Windows) and
`/aifs/dev/mapbrowser/data/mapbrowser.col` on *servb.ho.bom.gov.au*.



The following examples are typical settings for the color file:

```
; color file
; available colors
; 'White'          'Snow'          'Ivory'          'Light Yellow'
; 'Cornsilk'      'Beige'          'Seashell'      'Linen'
; 'Antique White' 'Papaya'        'Almond'        'Bisque'
; 'Moccasin'      'Wheat'         'Burlywood'     'Tan'
; 'Light Gray'    'Lavender'      'Medium Gray'   'Gray'
; 'Slate Gray'   'Dark Gray'     'Charcoal'      'Black'
; 'Light Cyan'    'Powder Blue'  'Sky Blue'      'Steel Blue'
; 'Dodger Blue'  'Royal Blue'   'Blue'          'Navy'
; 'Honeydew'     'Pale Green'   'Aquamarine'    'Spring Green'
; 'Cyan'         'Turquoise'    'Sea Green'     'Forest Green'
; 'Green Yellow' 'Chartreuse'   'Lawn Green'    'Green'
; 'Lime Green'   'Olive Drab'   'Olive'         'Dark Green'
; 'Pale Goldenrod' 'Khaki'        'Dark Khaki'    'Yellow'
; 'Gold'         'Goldenrod'    'Dark Goldenrod' 'Saddle Brown'
; 'Rose'         'Pink'         'Rosy Brown'    'Sandy Brown'
; 'Peru'         'Indian Red'   'Chocolate'     'Sienna'
; 'Dark Salmon'  'Salmon'       'Light Salmon'  'Orange'
; 'Coral'        'Light Coral'  'Firebrick'     'Brown'
; 'Hot Pink'     'Deep Pink'   'Magenta'       'Tomato'
; 'Orange Red'   'Red'         'Violet Red'    'Maroon'
; 'Thistle'     'Plum'        'Violet'        'Orchid'
; 'Medium Orchid' 'Dark Orchid' 'Blue Violet'   'Purple'

background_color_name='White'
map_color_name='Charcoal'
text_color_name='Black'
plot_color_name='Red'
contour_color_name='Black'
vector_color_name='Black'
barb_color_name='Black'
streamline_color_name='Black'
overlay_color_name='Black'
land_color_name='Snow'
```

The format of each line of the color file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the \$ symbol at the end of the line. Comments can be inserted by placing the ; symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the color file (i.e. specification of each variable is optional).

Table 2: Color options for Map Browser

Variable	Description	Default
background_color_name	Background color name	'White'
map_color_name	Map color name	'Charcoal'
text_color_name	Text color name	'Black'
plot_color_name	Plot color name	'Black'
contour_color_name	Contour color name	'Black'
vector_color_name	Vector color name	'Black'
barb_color_name	Barb color name	'Black'
streamline_color_name	Streamline color name	'Blue'
overlay_color_name	Overlay color name	'Red'
land_color_name	Land color name	'Snow'

Grid File

The grid file (i.e. mapbrowser_<name>.grd where <name> = 'metanal', 'ncep', 'ncep2-global', 'ncep2', 'noaa-global', 'noaa' or 'gcm') is an ASCII file and contains the information describing the archived grids available for the Map Browser system (see Table 3). It is located in the Map Browser data directory. The default grid file for Map Browser is

c:\idl\mapbrowser\data\mapbrowser_ncep.grd on the PC (Windows) and /aifs/dev/mapbrowser/data/mapbrowser_ncep.grd on *servb.ho.bom.gov.au*.

The following examples are typical settings for the grid file for the METANAL, NCEP, NCEP2-Global, NCEP2, NOAA-Global, NOAA and GCM grids:

```
; grid file (METANAL)

byte_ordering='big endian'
grid_model='METANAL'
grid_type='Analysis'
grid_nlon=54
grid_nlat=28
grid_minlon=90.5
grid_minlat=-50.0
grid_dx=1.5
grid_dy=1.5
grid_sdate=19700101
grid_edate=19931231
feb29=1
grid_fields=['mslp', 't850', 'z500', 'thik', 'mslpt850', 'mslpz500']
grid_field_names=['Mean Sea Level Pressure', '850 hPa Temperature', '$
                    500 hPa Height', '1000-500 hPa Thickness', '$
                    MSLP/850 hPa Temperature', 'MSLP/500 hPa Height']
grid_times=[00, 12]

; grid file (NCEP)

byte_ordering='big endian'
grid_model='NCEP'
grid_type='Analysis'
grid_nlon=33
grid_nlat=18
grid_minlon=90.0
grid_minlat=-50.0
grid_dx=2.5
grid_dy=2.5
olr_nlon=44
olr_nlat=23
olr_minlon=90.0
olr_minlat=-50.4752
olr_dx=1.875
olr_dy=1.905
grid_sdate=19480101
grid_edate=20011231
feb29=1
grid_fields=['mslp', 't850', 'z500', 'thik', 'pwtr', 'u1000', 'v1000', '$
            'divg1000', 'vort1000', 'wspd1000', 'wind1000', 'u500', 'v500', '$
            'divg500', 'vort500', 'wspd500', 'wind500', 'olr', 'mslpt850', '$
            'mslpz500', 'mslppwtr']
grid_field_names=['Mean Sea Level Pressure', '850 hPa Temperature', '$
                    500 hPa Height', '1000-500 hPa Thickness', '$
                    Precipitable Water', '1000 hPa U-Component', '$
                    1000 hPa V-Component', '1000 hPa Divergence', '$
                    1000 hPa Vorticity', '1000 hPa Wind Speed', '$
                    1000 hPa Wind', '500 hPa U-Component', '$
                    500 hPa V-Component', '500 hPa Divergence', '$
                    500 hPa Vorticity', '500 hPa Wind Speed', '$
                    500 hPa Wind', 'Outgoing Longwave Radiation', '$
                    MSLP/850 hPa Temperature', 'MSLP/500 hPa Height', '$
                    MSLP/Precipitable Water']
grid_times=[00, 06, 12, 18]

; grid file (NCEP2-Global)

byte_ordering='little endian'
```



```
grid_model='NCEP2-Global'  
grid_type='Analysis'  
grid_nlon=145  
grid_nlat=73  
grid_minlon=0.0  
grid_minlat=-90.0  
grid_dx=2.5  
grid_dy=2.5  
grid_sdate=19790101  
grid_edate=19991231  
feb29=1  
grid_fields=['mslp']  
grid_field_names=['Mean Sea Level Pressure']  
grid_times=[00, 06, 12, 18]  
  
; grid file (NCEP2)  
  
byte_ordering='little endian'  
grid_model='NCEP2'  
grid_type='Analysis'  
grid_nlon=33  
grid_nlat=18  
grid_minlon=90.0  
grid_minlat=-50.0  
grid_dx=2.5  
grid_dy=2.5  
grid_sdate=19790101  
grid_edate=19991231  
feb29=1  
grid_fields=['mslp']  
grid_field_names=['Mean Sea Level Pressure']  
grid_times=[00, 06, 12, 18]  
  
; grid file (NOAA-Global)  
  
byte_ordering='little endian'  
grid_model='NOAA-Global'  
grid_type='Analysis'  
grid_nlon=144  
grid_nlat=73  
grid_minlon=0.0  
grid_minlat=-90.0  
grid_dx=2.5  
grid_dy=2.5  
olr_nlon=144  
olr_nlat=73  
olr_minlon=0.0  
olr_minlat=-90.0  
olr_dx=2.5  
olr_dy=2.5  
grid_sdate=19740601  
grid_edate=20020831  
feb29=1  
grid_fields=['olr']  
grid_field_names=['Interpolated OLR']  
grid_times=[00]  
  
; grid file (NOAA)  
  
byte_ordering='little endian'  
grid_model='NOAA'  
grid_type='Analysis'  
grid_nlon=144  
grid_nlat=73  
grid_minlon=0.0  
grid_minlat=-90.0  
grid_dx=2.5  
grid_dy=2.5  
olr_nlon=45  
olr_nlat=33  
olr_minlon=70.0  
olr_minlat=-40.0  
olr_dx=2.5  
olr_dy=2.5  
grid_sdate=19740601  
grid_edate=20020831  
feb29=1  
grid_fields=['olr']  
grid_field_names=['Interpolated OLR']  
grid_times=[00]  
  
; grid file (GCM)
```

```

byte_ordering='little endian'
grid_model='GCM'
grid_type='Analysis'
grid_nlon=23
grid_nlat=14
grid_minlon=90.0
grid_minlat=-53.16
grid_dx=3.75
grid_dy=3.73
grid_sdate=31210101
grid_edate=32601231
feb29=0
grid_fields=['mslp', 'u995', 'v995', 'divg995', 'vort995', 'wspd995', $
             'wind995', 'q995', 'u840', 'v840', 'divg840', 'vort840', $
             'wspd840', 'wind840', 'q840', 'u720', 'v720', 'divg720', $
             'vort720', 'wspd720', 'wind720', 'q720', 'u541', 'v541', $
             'divg541', 'vort541', 'wspd541', 'wind541', 'q541']
grid_field_names=['Mean Sea Level Pressure', '0.995 U-Component', $
                 '0.995 V-Component', '0.995 Divergence', '0.995 Vorticity', $
                 '0.995 Wind Speed', '0.995 Wind', '0.995 Mixing Ratio', $
                 '0.840 U-Component', '0.840 V-Component', $
                 '0.840 Divergence', '0.840 Vorticity', '0.840 Wind Speed', $
                 '0.840 Wind', '0.840 Mixing Ratio', '0.720 U-Component', $
                 '0.720 V-Component', '0.720 Divergence', '0.720 Vorticity', $
                 '0.720 Wind Speed', '0.720 Wind', '0.720 Mixing Ratio', $
                 '0.541 U-Component', '0.541 V-Component', $
                 '0.541 Divergence', '0.541 Vorticity', '0.541 Wind Speed', $
                 '0.541 Wind', '0.541 Mixing Ratio']
grid_times=[00]

```

The format of each line of the grid file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the `$` symbol at the end of the line. Comments can be inserted by placing the `;` symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the grid file (i.e. specification of each variable is optional).

Table 3: Grid options for Map Browser

Variable	Description	Default
byte_ordering	File byte ordering ('little endian' or 'big endian')	'big endian'
grid_model	Grid model ('METANAL', 'NCEP', 'NCEP2-Global', 'NCEP2', 'NOAA-Global', 'NOAA' or 'GCM')	'NCEP'
grid_type	Grid type	'Analysis'
grid_nlon	Grid number of longitudes	33
grid_nlat	Grid number of latitudes	18
grid_minlon	Grid minimum longitude	90.0
grid_minlat	Grid minimum latitude	-50.0
grid_dx	Grid X-increment	2.5
grid_dy	Grid Y-increment	2.5
olr_nlon	OLR number of longitudes	44
olr_nlat	OLR number of latitudes	23
olr_minlon	OLR minimum longitude	90.0
olr_minlat	OLR minimum latitude	-50.4752



Variable	Description	Default
olr_dx	OLR X-increment	1.875
olr_dy	OLR Y-increment	1.905
grid_sdate	Grid Start Date	19480101
grid_edate	Grid End Date	20011231
feb29	February (29 days)	1
grid_fields	Grid Fields	['mslp']
grid_field_names	Grid Field Names	['Mean Sea Level Pressure']
grid_times	Grid Times	[00, 12]

Region File

The region file (i.e. `mapbrowser.reg`) is an ASCII file and contains the names and longitude/latitude limits of the regions for the Map Browser system (see Table 4). It is located in the Map Browser data directory. The default region file for Map Browser is `c:\idl\mapbrowser\data\mapbrowser.reg` on the PC (Windows) and `/aifs/dev/mapbrowser/data/mapbrowser.reg` on `servb.ho.bom.gov.au`.

The following examples are typical settings for the region file:

```
; region file

regions=['rsmctropics', 'northernextratropics', 'northern_tropics', 'equatorial', $
'southern_tropics', 'southernextratropics', 'austropics', 'seasia', 'aus', $
'eaus', 'vic', 'nsw1', 'nsw2', 'qld1', 'qld2', 'qld3', 'qld4', $
'qld5', 'nt1', 'nt2', 'wa1', 'wa2', 'wa3', 'wa4', 'wa5', 'wa6', $
'sa', 'tas', 'ant']
region_names=['RSMC Tropics', 'Northern Extratropics', 'Northern Tropics', $
'Equatorial', 'Southern Tropics', 'Southern Extratropics', $
'Australian Tropics', 'SouthEast Asia', 'Australia', $
'E Australia', 'VIC (Melbourne)', 'NSW (Sydney)', $
'NSW (Cobar)', 'QLD (Brisbane)', 'QLD (Rockhampton)', $
'QLD (Townsville)', 'QLD (Normanton)', 'QLD (Charleville)', $
'NT (Darwin)', 'NT (Alice Springs)', 'WA (Perth)', $
'WA (Carnarvon)', 'WA (Port Hedland)', 'WA (Broome)', $
'WA (Kalgoorlie)', 'WA (Eucla)', 'SA (Adelaide)', $
'TAS (Hobart)', 'Antarctic']
minlons=[ 70.0, 70.0, 70.0, 70.0, 70.0, 90.0, 90.0, 90.0, $
130.0, 137.5, 142.5, 137.5, 145.0, 142.5, 140.0, 132.5, 137.5, $
122.5, 127.5, 107.5, 105.0, 110.0, 115.0, 115.0, 122.5, 130.0, $
140.0, 90.0]
minlats=[-40.0, 15.0, 5.0, -5.0, -15.0, -40.0, -40.0, 0.0, -50.0, $
-50.0, -45.0, -42.5, -40.0, -35.0, -30.0, -25.0, -25.0, -32.5, $
-20.0, -30.0, -40.0, -32.5, -27.5, -25.0, -37.5, -40.0, -42.5, $
-50.0, -80.0]
maxlons=[180.0, 180.0, 180.0, 180.0, 180.0, 180.0, 170.0, 120.0, 170.0, $
170.0, 152.5, 157.5, 152.5, 160.0, 157.5, 155.0, 147.5, 152.5, $
140.0, 142.5, 122.5, 120.0, 125.0, 130.0, 130.0, 137.5, 145.0, $
155.0, 180.0]
maxlats=[ 40.0, 40.0, 15.0, 5.0, -5.0, -15.0, 15.0, 25.0, -7.5, $
-7.5, -30.0, -27.5, -25.0, -20.0, -15.0, -10.0, -10.0, -17.5, $
-7.5, -15.0, -25.0, -17.5, -12.5, -10.0, -22.5, -25.0, -27.5, $
-35.0, -55.0]
```

The format of each line of the region file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the `$` symbol at the end of the line. Comments can be inserted by placing the `;` symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the region file (i.e. specification of each variable is optional).

Table 4: Region options for Map Browser

Variable	Description	Default
regions	Regions	['aus']
region_names	Region names	['Australia']
minlons	Minimum longitudes	[90.0]
minlats	Minimum latitudes	[-50.0]
maxlons	Maximum longitudes	[170.0]
maxlats	Maximum latitudes	[-7.5]

Variable File

The variable file (i.e. `mapbrowser_<variable>.var` where `<variable>` = 'hw', 'wh' or 'none') is an ASCII file and contains the variable information for the Map Browser system (see Table 5). It is located in the Map Browser data directory. The default parameter file for Map Browser is

`c:\idl\mapbrowser\data\mapbrowser_hw.var` on the PC (Windows) and `/aifs/dev/mapbrowser/data/mapbrowser_hw.var` on *servb.ho.bom.gov.au*.

The following examples are typical settings for the variable file for heat wave and wave height data, or none:

```
; variable file (heat wave)

save_data=0
save_file='mslp00.csv'
save_sdate=19480101
save_edate=20011231
station_nos=[086071, 094029]
station_tzs=[10.0, 10.0]
stations=['melb', 'hoba']
station_names=['Melbourne', 'Hobart']
station_lons=[144.97, 147.33]
station_lats=[-37.81, -42.89]
variable_window=3
variables=['hw']
variable_names=['Heat Wave']
variable_syms=[string(byte(164))]
variable_fmts=['(i3)']

; variable file (wave height)

save_data=0
save_file='mslp00.csv'
save_sdate=19480101
save_edate=20011231
station_nos=[300001, 300002, 300003, 300004, 300005, 300006, 300007]
station_tzs=[10.0, 10.0, 10.0, 10.0, 10.0, 10.0, 10.0]
stations=['bate', 'byro', 'coff', 'crow', 'eden', 'pkem', 'sydn']
station_names=['Batemans Bay', 'Byron Bay', 'Coffs Harbour', 'Crowdy Head', $
'Eden', 'Port Kembla', 'Sydney']
station_lons=[150.37, 153.75, 153.27, 152.87, 150.13, 151.05, 151.42]
station_lats=[-35.72, -28.67, -30.35, -31.25, -37.17, -34.45, -33.78]
variable_window=3
variables=['wh']
variable_names=['Wave Height']
variable_syms=['!19'+string(byte(165))+ '!3']
variable_fmts=['(f4.1)']

; variable file (none)

save_data=0
save_file='mslp00.csv'
```



```

save_sdate=19480101
save_edate=20011231
station_nos=[086071, 011052, 026021, 084016, 091292, 075031]
station_tzs=[10.0, 8.0, 9.5, 10.0, 10.0, 10.0]
stations=['melb', 'forr', 'mtga', 'gabo', 'smit', 'hay']
station_names=['Melbourne', 'Forrest', 'Mt Gambier', 'Gabo Island', '$
               'Smithton', 'Hay']
station_lons=[144.97, 128.11, 140.77, 149.91, 145.08, 144.85]
station_lats=[-37.81, -30.84, -37.75, -37.57, -40.84, -34.52]

```

The format of each line of the variable file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the `$` symbol at the end of the line. Comments can be inserted by placing the `;` symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the variable file (i.e. specification of each variable is optional).

Table 5: Variable options for Map Browser

Variable	Description	Values	Default
save_data	Save Data	0, 1	0
save_file	Save File		'mslp00.csv'
save_sdate	Save Start Date	YYYYMMDD	19830201
save_edate	Save End Date	YYYYMMDD	19830228
station_nos	Station numbers		[086071]
station_tzs	Station Time Zones	Hours	[10.0]
stations	Stations		['melb']
station_names	Station Names		['Melbourne']
station_lons	Station Longitudes		[144.97]
station_lats	Station Latitudes		[-37.81]
variable_window	Variable Window	Hours	3
variables	Variables		'hw'
variable_names	Variable Names		'Heat Wave'
variable_syms	Variable Symbols		[string(byte(164))]
variable_fmths	Variable Formats		['(i3)']

Parameter File

The parameter file (i.e. `mapbrowser.prm`) is an ASCII file and contains the parameters for the Map Browser system (see Table 6). It is located in the Map Browser data directory. The default parameter file for Map Browser is `c:\idl\mapbrowser\data\mapbrowser.prm` on the PC (Windows) and `/aifs/dev/mapbrowser/data/mapbrowser.prm` on *servb.ho.bom.gov.au*.

The following examples are typical settings for the parameter file:

```

; parameter file

region='aus'
grids='ncep'

```

```

grid_field='mslp'
startup_date=19830216
grid_time=00
plot_grid=1
map_boxaxes=1
map_hires=0
longitude_interval=5
latitude_interval=5
high_label=0
low_label=0
contour_detail=0
map_projection='Cylindrical'
wind_image='Vector'
background_land=0
background_coast=1
wind_vector_size=15
wind_barb_size=20
wind_shaft_size=15
seed_point_density=2
maximum_step_size=5
maximum_iterations=20
plot_sampling=1
open_tc=1
tc_file='cyclones.txt'
plot_tc=0
tc_window=1
tc_window_max=36
open_st=0
maxnst=99
maxnd=20000
mean_field=0
st_class=0
st_member=0
st_file='treloarstern1993.st'
csv_file='treloarstern1993.csv'
variable='hw'
plot_variable=0
station='melb'
plot_station=0

```

The format of each line of the parameter file follows the syntax rules of IDL (i.e. each line is executed like an IDL statement). For example, to set an IDL variable to a specific value use `<variable>=<value>`. Lines can be continued by placing the `$` symbol at the end of the line. Comments can be inserted by placing the `;` symbol at the beginning of the line. Blank lines are ignored. The default value of a variable is used if it is not specified in the parameter file (i.e. specification of each variable is optional).

Table 6: Parameter options for Map Browser

Variable	Description	Values	Default
----------	-------------	--------	---------



Variable	Description	Values	Default
region	Region	'rsmctropics', 'northextratropics', 'northtropics', 'equatorial', 'southtropics', 'southextratropics', 'austropics', 'seasia', 'aus', 'eaus', 'vic', 'nsw1', 'nsw2', 'qld1', 'qld2', 'qld3', 'qld4', 'qld5', 'nt1', 'nt2', 'wa1', 'wa2', 'wa3', 'wa4', 'wa5', 'wa6', 'sa', 'tas', 'ant'	'aus'
grids	Grids	'metanal', 'ncep', 'ncep2-global', 'ncep2', 'noaa-global', 'noaa', 'gcm'	'ncep'
grid_field	Grid Field	'none', 'mslp', 't850', 'z500', 'thik', 'pwtr', 'u1000', 'v1000', 'divg1000', 'vort1000', 'wspd1000', 'wind1000', 'u500', 'v500', 'divg500', 'vort500', 'wspd500', 'wind500', 'u995', 'v995', 'divg995', 'vort995', 'wspd995', 'wind995', 'u840', 'v840', 'divg840', 'vort840', 'wspd840', 'wind840', 'u720', 'v720', 'divg720', 'vort720', 'wspd720', 'wind720', 'u541', 'v541', 'divg541', 'vort541', 'wspd541', 'wind541', 'olr', 'mslpt850', 'mslpz500', 'mslppwtr'	'mslp'
startup_date	Startup Date	YYYYMMDD	19830216
grid_time	Grid Time	00, 06, 12, 18	00
plot_grid	Plot Grid	0, 1	1
map_boxaxes	Map Box Axes	0, 1	1
map_hires	Map Hi-Res	0, 1	0
longitude_interval	Longitude interval	0-10, step=1	5
latitude_interval	Latitude interval	0-10, step=1	5
high_label	High Labels	0, 1	0

Variable	Description	Values	Default
low_label	Low Labels	0, 1	0
contour_detail	Contour Detail	0, 1	0
map_projection	Map Projection	'Cylindrical', 'Mercator', 'Lambert', 'Stereographic'	'Cylindrical'
wind_image	Wind Image	'Vector', 'Barb', 'Streamline'	'Vector'
background_land	Background Land	0, 1	0
background_coast	Background Coast	0, 1	1
wind_vector_size	Wind Vector Size	5-20, step=1	15
wind_barb_size	Wind Barb Size	1-60, step=10	20
wind_shaft_size	Wind Shaft Size	5-50, step=5	15
seed_point_density	Seed Point Density	1-10, step=1	2
maximum_stepsize	Maximum Step Size	1-20, step=1	5
maximum_iterations	Maximum Iterations	1-500, step=50	20
plot_sampling	Plot Sampling	1-10, step=1	1
open_tc	Open Tropical Cyclones File	0, 1	1
tc_file	Synoptic Types File (ST)		'cyclones.txt'
plot_tc	Plot Tropical Cyclones	0, 1	0
tc_window	TC Window (hours)	1-36, step=1	1
tc_window_max	TC Window Maximum Value (hours)		36
open_st	Open Synoptic Types File	0, 1	0
maxnst	Maximum Number of Synoptic Types		99
maxnd	Maximum Number of Days		20000



Variable	Description	Values	Default
mean_field	Mean Field	0, 1	0
st_class	Synoptic Type Class		0
st_member	Synoptic Type Member		0
st_file	Synoptic Types File (ST)		'treloarstern1993.st'
csv_file	Synoptic Types File (CSV)		'treloarstern1993.csv'
variable	Variable	'none', 'hw' 'wh'	'hw'
plot_variable	Plot Variable	0, 1	0
station	Station		'melb'
plot_station	Plot Station	0, 1	0

Log File

The log file (i.e. `mapbrowser.log`) is an ASCII file and contains date/time stamps of whenever the Map Browser system is started, its progress and when it finishes. It is located in the Map Browser data directory. The default log file for Map Browser is `c:\idl\mapbrowser\data\mapbrowser.log` on the PC (Windows) and `/aifs/dev/mapbrowser/data/mapbrowser.log` on `servb.ho.bom.gov.au`. Errors will also be written to the log file. Logging can be turned off by setting `log=0` in the Map Browser configuration file.

Installing Map Browser System

The Map Browser system can be installed on the PC (Windows or Linux). IDL 5.5 will need to be installed on the PC and licensed for run-time or development.

The Map Browser system has been installed on `servb.ho.bom.gov.au` as user `aifsdev` into the file system `/aifs/dev` using `mapbrowser` as the sub-system name (i.e. `/aifs/dev/mapbrowser`).

Map Browser files have been organised into a number of sub-directories described in Table 7.

Table 7: Map Browser File Organisation

Sub-directory	Files	Description
batch		Batch directory
bin	mapbrowser.sav	Map Browser application
data	mapbrowser.cfg	Configuration file (interactive mode)
data	mapbrowser.col	Color file

data	mapbrowser_<name>.grd where <name> = 'metanal', 'ncep', 'ncep2-global', 'ncep2', 'noaa-global', 'noaa' or 'gcm'	Grid file
data	mapbrowser.reg	Region file
data	mapbrowser_<variable>.grd where <variable> = 'none', 'hw' or 'wh'	Variable file
data	mapbrowser.prm	Parameter file
data	mapbrowser.log	Log file
docs	mapbrowser.doc	Reference Manual (DOC)
save		Save directory
src	*.pro	Source code (IDL)
src	makeall.pro	Makefile (IDL)
tc	cyclones.txt	Tropical Cyclones directory
st	*.st, *.csv	Synoptic Types directory
var	*.csv	Variable directory

The archive grids (i.e. METANAL, NCEP, NCEP2-Global, NCEP2, NOAA-Global, NOAA and GCM) have been located in `/td/<name>` on `servb.ho.bom.gov.au` where `<name>` = 'metanal', 'ncep', 'ncep2-global', 'ncep2', 'noaa-global', 'noaa' or 'gcm'.

Running Map Browser System

The Map Browser system can be started from the Map Browser icon on the desktop on the PC (Windows).

The Map Browser system can be started by a script from the command line (at the UNIX prompt) on `servb.ho.bom.gov.au`.

To run the Map Browser system (interactive mode) from the command line using a script requires entering the following command after you login as user `aifsdev`:

```
/aifs/dev/bin/run_mapbrowser
```

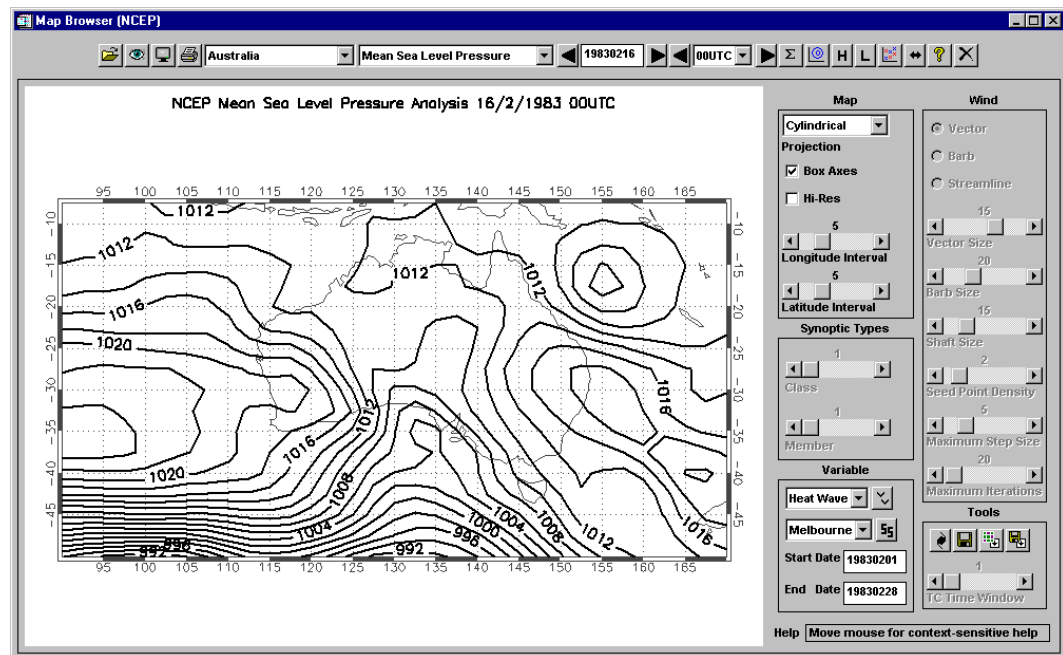


Map Browser GUI

Map Browser features can be developed and demonstrated in interactive mode (GUI-based application) on the PC (Windows or Linux) or in UNIX (e.g. *servb.ho.bom.gov.au*).

The Map Browser GUI is presented in Figure 1.

Figure 1: Map Browser GUI



The Map Browser GUI consists of a title bar, horizontal toolbar, display window, vertical toolbars and help window.

Title Bar



The title bar contains the name of the application (i.e. Map Browser) and archived grids (e.g. NCEP) currently being browsed. The source of the grids is specified in the parameter file (i.e. *grid_model*) and cannot be changed via the GUI after startup of Map Browser.

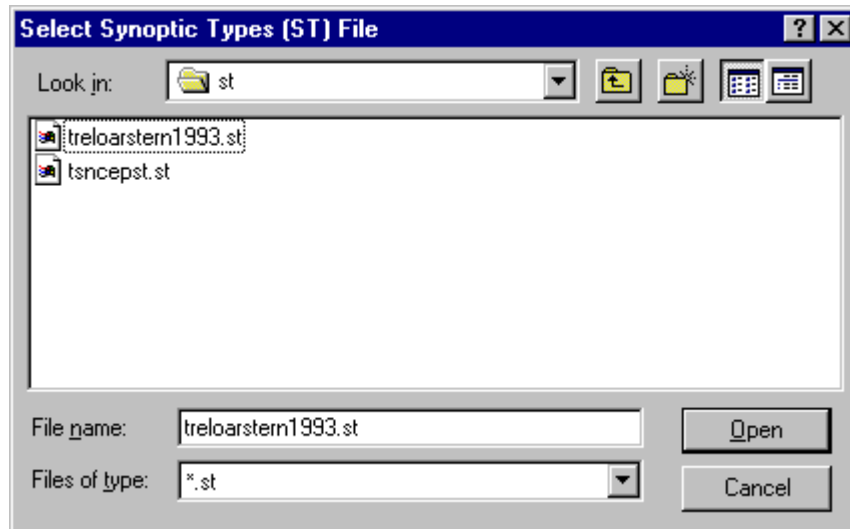
Horizontal Toolbar



The horizontal toolbar contains a set of buttons and droplists, and a date entry window.



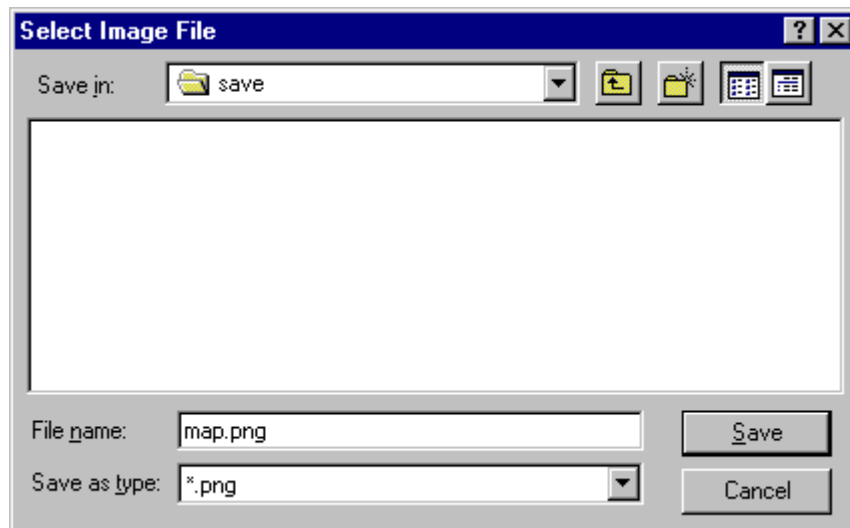
The “Open synoptic types” button is used to open a synoptic types file. A file selection dialog titled “Select Synoptic Types (ST) File” will be displayed.



Labels in the display window will be updated for the synoptic types. An error message will be displayed if the synoptic types file is unable to be read.



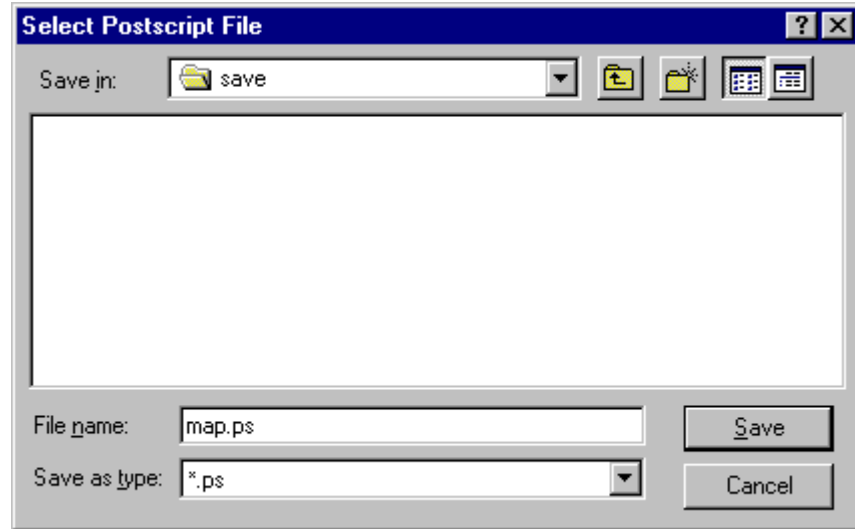
The “Save display as image” button is used to save the display as an image file. A file selection dialog titled “Select Image File” will be displayed.



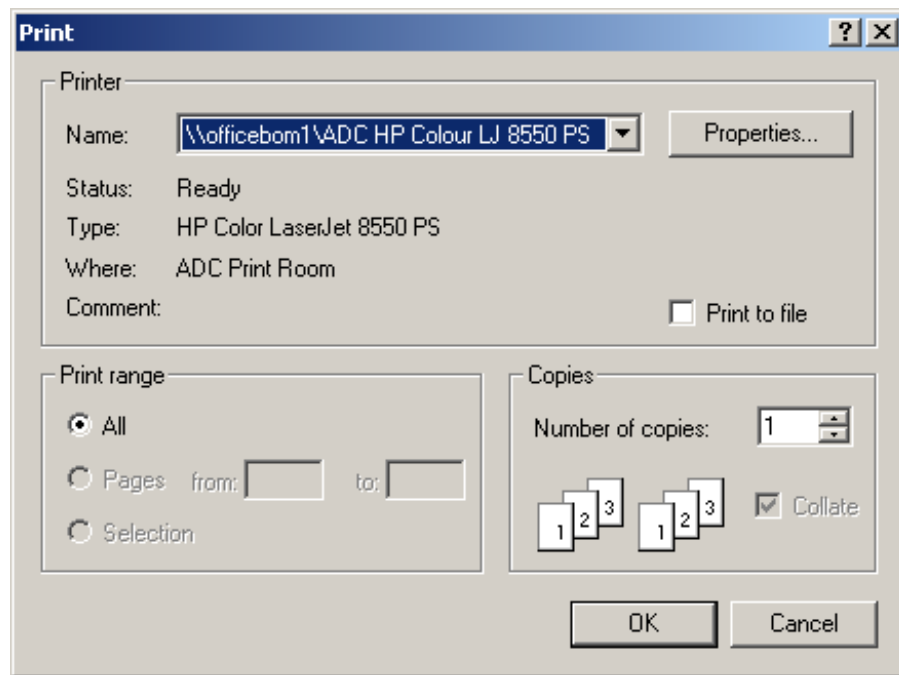
PNG is the only image format currently available.



The “Save display as postscript” button is used to save the display as a postscript file. A file selection dialog titled “Select Postscript File” will be displayed.



The “Print display” button is used to print the display. A printer dialog titled “Print” will be displayed.



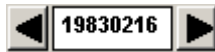
Printing is not currently available in UNIX.



The “Select region of interest” droplist is used to select the region of interest to be displayed from a pre-defined list of choices specified in the region file.



The “Select grid field” droplist is used to select the grid field to be displayed from a pre-defined list of choices specified in the grid file. Labels in the display window will be updated for the selected grid field. A warning message will be displayed if the field is not available (i.e. archived grids for this field have not been installed).



The “Enter date (YYYYMMDD)” window, and “Move date backward one day” and “Move date forward one day” buttons are used to enter or change the grid date to be displayed. Labels in the display window will be updated for the selected grid date. An error message will be displayed if an invalid date is entered.



The “Select time” droplist, and “Move time backward one time step” and “Move time forward one timestep” buttons are used to change the grid time to be displayed. Labels in the display window will be updated for the selected grid time. A warning message will be displayed if the time is not available (i.e. archive grids for this time have not been installed).



The “Turn on/off calculating mean field” button is used to toggle the calculation of the mean field. The mean field for the selected month will be displayed. If a synoptic types file has been opened and analogue mode has been selected, the mean field for the selected synoptic types class will be displayed. If a weather variable has been selected, and plotting of the variable turned on, the frequency of the variable will also be displayed. Labels in the display window will be updated for the calculation of the mean field.



The “Increase/decrease number of contour levels” button is used to toggle the level of contour detail to be displayed. An informational message will be displayed (i.e. changing number of contour levels does not affect wind fields) if the level of contour detail is changed and wind fields are being displayed.



The “Turn on/off plotting of high labels” button is used to toggle the plotting of high labels. An informational message will be displayed (i.e. displaying high labels does not affect wind fields) if the plotting of high labels is turned on and wind fields are being displayed.



The “Turn on/off plotting of low labels” button is used to toggle the plotting of low labels. An informational message will be displayed (i.e. displaying low labels does not affect wind fields) if the plotting of low labels is turned on and wind fields are being displayed.



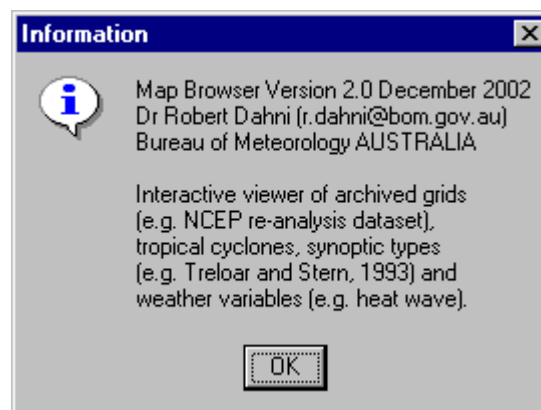
The “Decrease/increase plot density” button is used to toggle the plot density of wind vector or barb fields. An informational message will be displayed (i.e. changing plot density only affects wind vector or barb fields) if the plot density is changed and wind vector or barb fields are not being displayed.



The “Select analogue/date mode” button is used to toggle between analogue and date modes. Labels in the display window will be updated for analogue and date modes. A warning message will be displayed if a synoptic types file is not open and analogue mode is selected. A warning message will be displayed if calculating the mean field and date mode is selected.

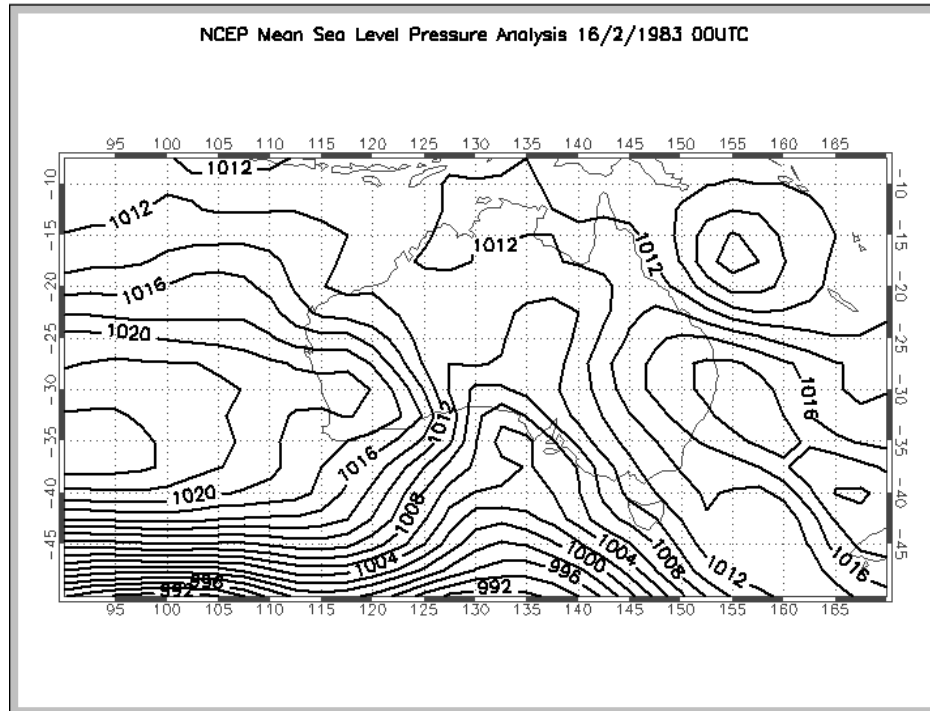


The “About Map Browser” button is used to display information briefly describing Map Browser and including its version number and date. An informational message will be displayed.

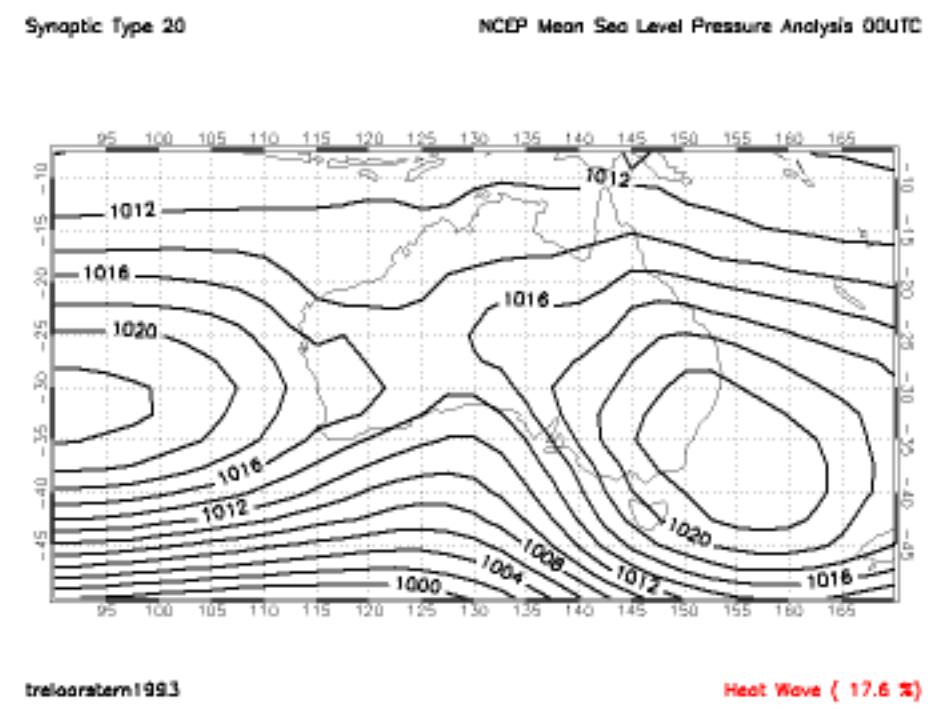


The “Exit Map Browser” button is used to exit Map Browser.

Display Window

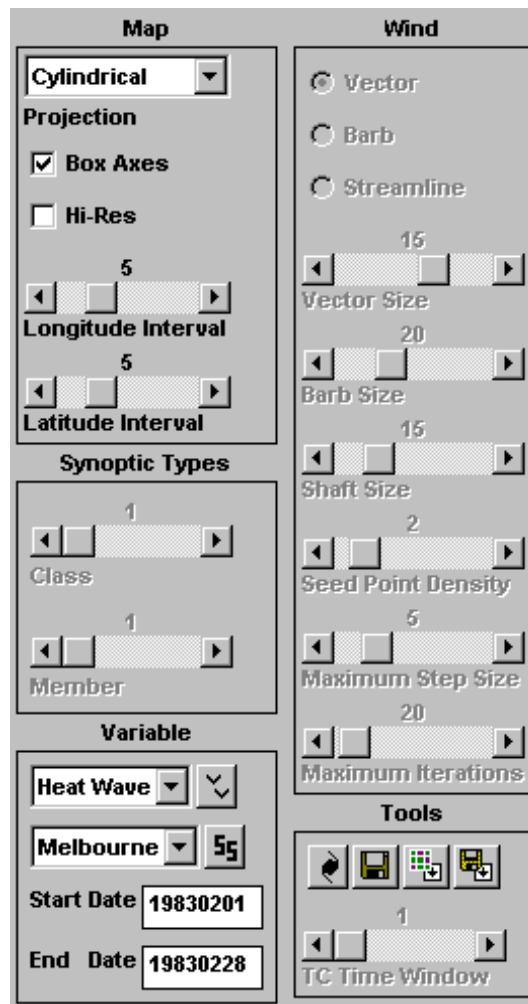


The display window contains the map background, grid field and weather variable data to be displayed. The display window is resizable, but cannot be resized smaller than a pre-defined width (i.e. draw_xsize) and height (i.e. draw_ysize) specified in the configuration file. Header and footer labels describe the contents of the window.





Vertical Toolbars



The vertical toolbars contain a set of buttons, droplists and sliders, and date entry windows. There are left and right vertical toolbars.



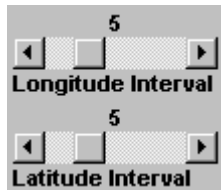
The “Select map projection” droplist is used to select the map projection from a list of pre-defined choices (i.e. Cylindrical, Mercator, Lambert or Stereographic). If the stereographic projection is selected the maximum domain of the grid will be displayed (i.e. the region of interest will be ignored).



The “Box Axes” button is used to toggle the display of map box axes and longitude/latitude labels.



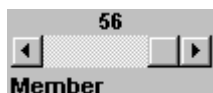
The “Hi-Res” button is used to toggle the display of low- or high-resolution coastlines (if the high-resolution coastlines have not been installed).



The “Longitude/Latitude Interval” sliders are used to change the longitude and latitude intervals (degrees) to be displayed.



The “Synoptic Types Class” slider is used to change the synoptic types class to be displayed. The synoptic types member slider will be reset to the last member of the selected class.



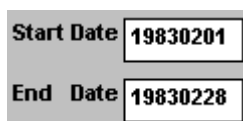
The “Synoptic Types Member” slider is used to change the member number of the synoptic types class to be displayed.



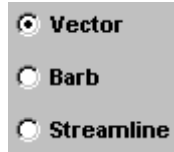
The “Select weather variable” droplist and “Turn off/on plotting variable” button are used to select the weather variable for plotting in the display window. If a synoptic types file has been opened, analogue mode selected, and calculating the mean field, the frequency of the weather variable (for the selected synoptic types class and specified station) will be displayed. The variable frequency will not be displayed if “All” stations are selected.



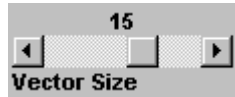
The “Select station” droplist and “Turn off/on station location” button are used to select the station for plotting in the display window, and whether a symbol (i.e. “X”) is plotted at the station location.



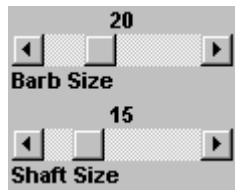
The “Start/End Date” windows are used to change the start and end dates of the period used for saving interpolated grid (station) data. An error message will be displayed if an invalid date is entered.



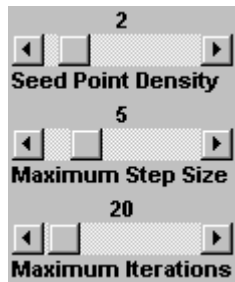
The “Wind display type” set of buttons is used to select the type of wind field (i.e. Vector, Barb or Streamline) to be displayed.



The “Wind Vector Size” slider is used to change the size of the wind vector.



The “Wind Barb/Shaft Size” sliders are used to change the size of the wind barb and shaft.



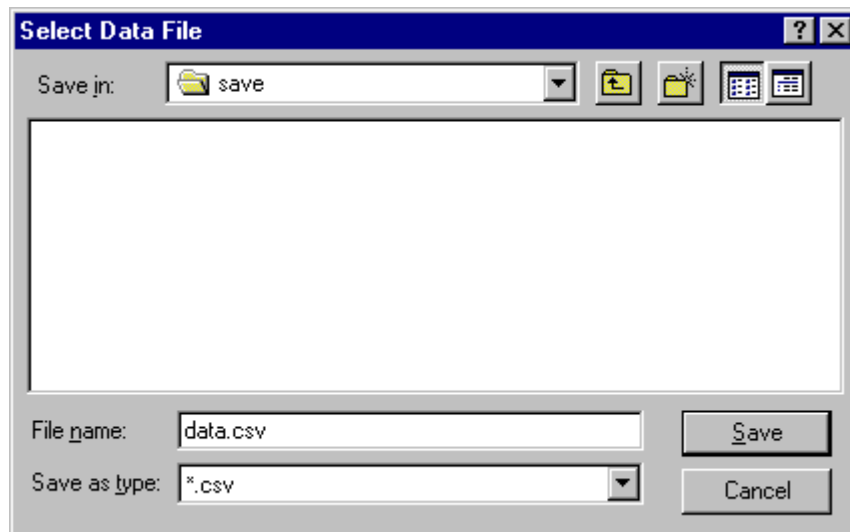
The “Wind Seed Point Density, Maximum Step Size and Maximum Iterations” sliders are used to change the wind streamlines depiction.



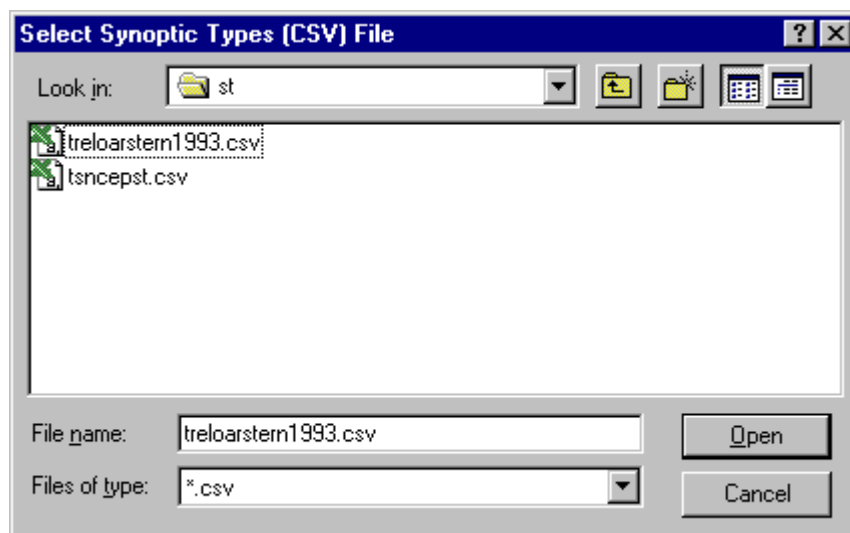
The “Turn on/off plotting of tropical cyclones” button is used to toggle the plotting of tropical cyclone positions.



The “Save interpolated grid (station) data” button is used to save interpolated grid (station) data. A file selection dialog titled “Select Data File” will be displayed.



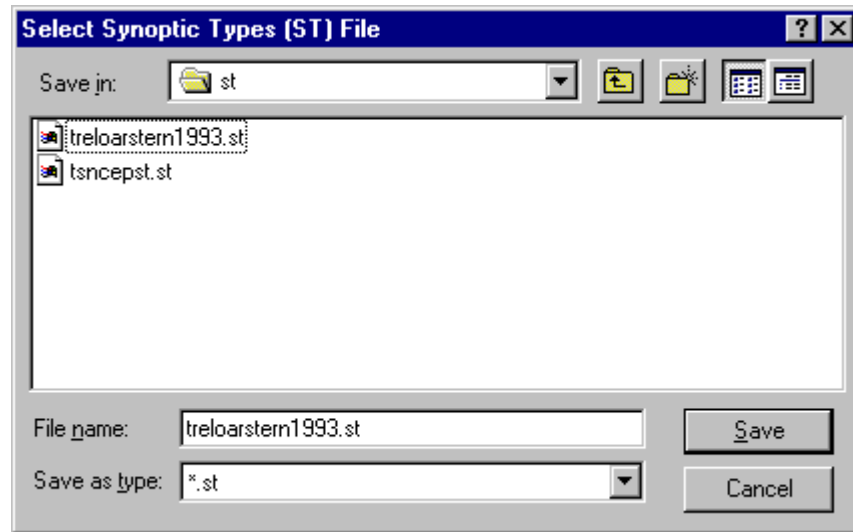
The “Import synoptic types (CSV to ST)” button is used to convert synoptic type files in CSV format to ST format. A file selection dialog titled “Select Synoptic Types (CSV) File” will be displayed.



An informational message will be displayed (i.e. synoptic types conversion successful) when the process has completed.



The “Export synoptic types (ST to CSV)” button is used to convert synoptic type files in ST format to CSV format. A file selection dialog titled “Select Synoptic Types (ST) File” will be displayed.



An informational message will be displayed (i.e. synoptic types conversion successful) when the process has completed.



The “TC Time Window” slider is used to change the time window (hours) used to display the plotting of tropical cyclones.

Help Window



The “Move mouse for context-sensitive help” window is used to display context-sensitive help information.

Map Browser Batch

All Map Browser features can also be automated. Map Browser has been designed to operate both in an interactive and non-interactive (i.e. batch) mode by setting the batch variable in the configuration file.

To automatically save the map to be displayed (as specified by the contents of the parameter file) as an image (i.e. PNG format) file, set batch=1 (uses the Z-buffer).

To automatically save the map to be displayed (as specified by the contents of the parameter file) as a postscript file, set batch=2 (uses the Postscript device).

If a synoptic types file is opened, analogue mode and mean field are selected, synoptic types class 1 is selected, and batch mode is set, the mean field for each synoptic types class will be automatically generated as an image or postscript file.

If plotting the weather variable is also turned on, a frequency analysis of the variable for each synoptic class and station will also be automatically generated in a CSV (ASCII) format. For example, from the file `treloarstern1993_hw.csv` in the save directory:

```
Synoptic Type,Melbourne,Hobart
17, 2.2, 0.0
18, 3.7, 4.3
19, 3.7, 3.2
20, 17.6, 22.3
21, 5.9, 0.0
22, 2.9, 0.0
23, 0.0, 1.1
24, 0.0, 1.1
25, 0.0, 1.1
26, 0.0, 1.1
27, 0.0, 0.0
28, 0.0, 0.0
29, 0.0, 0.0
30, 0.0, 0.0
31, 0.0, 0.0
32, 0.0, 0.0
33, 0.0, 0.0
34, 16.9, 20.2
35, 3.7, 5.3
36, 1.5, 2.1
37, 1.5, 2.1
38, 2.9, 2.1
39, 0.0, 1.1
40, 0.0, 0.0
```



Map Browser Resources

Fields

Map Browser can display both raw and derived grid fields.

The fields available in the METANAL grids are presented in Table 8.

Table 8: Grid Fields (METANAL)

Variable	Field	Units	Status
mssl	Mean Sea Level pressure	hPa	
t850	850 hPa Temperature	°C	
z500	500 hPa Height	dm	
thik	1000-500 hPa Thickness	dm	Derived

The fields available in the NCEP grids are presented in Table 9.

Table 9: Grid Fields (NCEP)

Variable	Field	Units	Status
mssl	Mean Sea Level pressure	hPa	
t850	850 hPa Temperature	°C	
z500	500 hPa Height	dm	
thik	1000-500 hPa Thickness	dm	Derived
pwtr	Precipitable Water		
u1000	1000 hPa U-Component	m/s	
v1000	1000 hPa V-Component	m/s	
divg1000	1000 hPa Divergence		Derived
vort1000	1000 hPa Vorticity		Derived
wspd1000	1000 hPa Wind Speed	knots	Derived
wind1000	1000 hPa Wind		Derived
u500	500 hPa U-Component	m/s	
v500	500 hPa V-Component	m/s	
divg500	500 hPa Divergence		Derived
vort500	500 hPa Vorticity		Derived
wspd500	500 hPa Wind Speed	knots	Derived
wind500	500 hPa Wind		Derived
olr	Outgoing Longwave Radiation		

The fields available in the NCEP2-Global and NCEP2 grids are presented in Table 10.

Table 10: Grid Fields (NCEP2-Global and NCEP2)

Variable	Field	Units	Status
mssl	Mean Sea Level pressure	hPa	

The fields available in the NOAA-Global and NOAA grids are presented in Table 11.

Table 11: Grid Fields (NOAA-Global and NOAA)

Variable	Field	Units	Status
olr	Interpolated Outgoing Longwave Radiation	W/m ²	

The fields available in the GCM grids are presented in Table 12.

Table 12: Grid Fields (GCM)

Variable	Field	Units	Status
mssl	Mean Sea Level pressure	hPa	
u995	0.995 U-Component	m/s	
v995	0.995 V-Component	m/s	
divg995	0.995 Divergence		Derived
vort995	0.995 Vorticity		Derived
wspd995	0.995 Wind Speed	knots	Derived
wind995	0.995 Wind		Derived
q995	0.995 Mixing Ratio	g/kg	
u840	0.840 U-Component	m/s	
v840	0.840 V-Component	m/s	
divg840	0.840 Divergence		Derived
vort840	0.840 Vorticity		Derived
wspd840	0.840 Wind Speed	knots	Derived
wind840	0.840 Wind		Derived
q840	0.840 Mixing Ratio	g/kg	
u720	0.720 U-Component	m/s	
v720	0.720 V-Component	m/s	
divg720	0.720 Divergence		Derived
vort720	0.720 Vorticity		Derived
wspd720	0.720 Wind Speed	knots	Derived
wind720	0.720 Wind		Derived
q720	0.720 Mixing Ratio	g/kg	
u541	0.541 U-Component	m/s	
v541	0.541 V-Component	m/s	

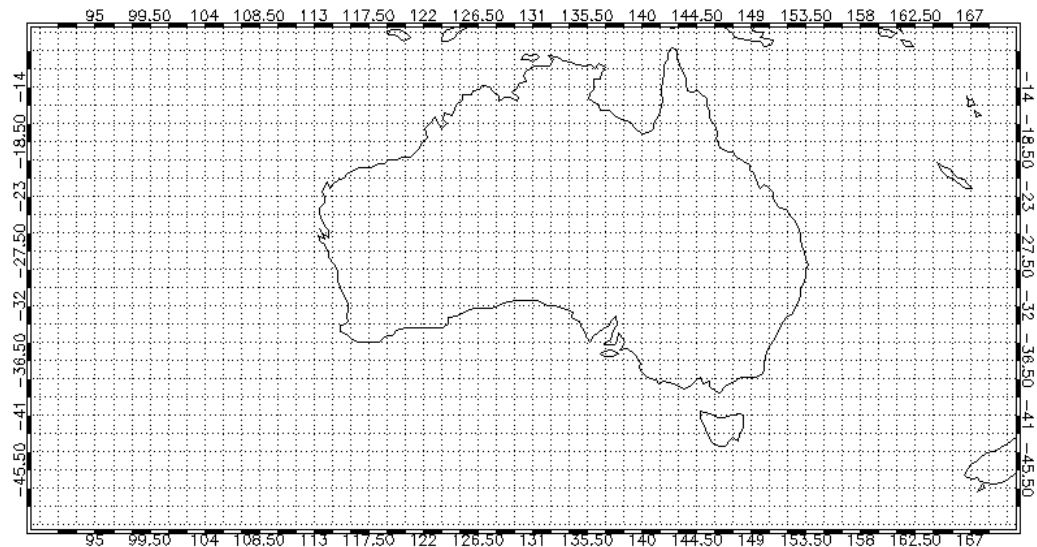


divg541	0.541 Divergence		Derived
vort541	0.541 Vorticity		Derived
wspd541	0.541 Wind Speed	knots	Derived
wind541	0.541 Wind		Derived
q541	0.541 Mixing Ratio	g/kg	

METANAL Dataset

The Bureau of Meteorology's METANAL dataset for the Australian region covers the period 1 January 1970 to 31 December 1993. The METANAL grids contain a history of 00UTC and 12UTC analyses from the regional (i.e. RASP) model at a resolution of 1.5° over a specific (90.5E-170E, 50S-9.5S) geographical region for a variety of fields (i.e. mean sea level pressure, 850 hPa temperature, 1000, 850, 700, 500, 300 and 250 hPa geopotential height, 500 hPa wind speed). The METANAL grid is presented in Figure 2.

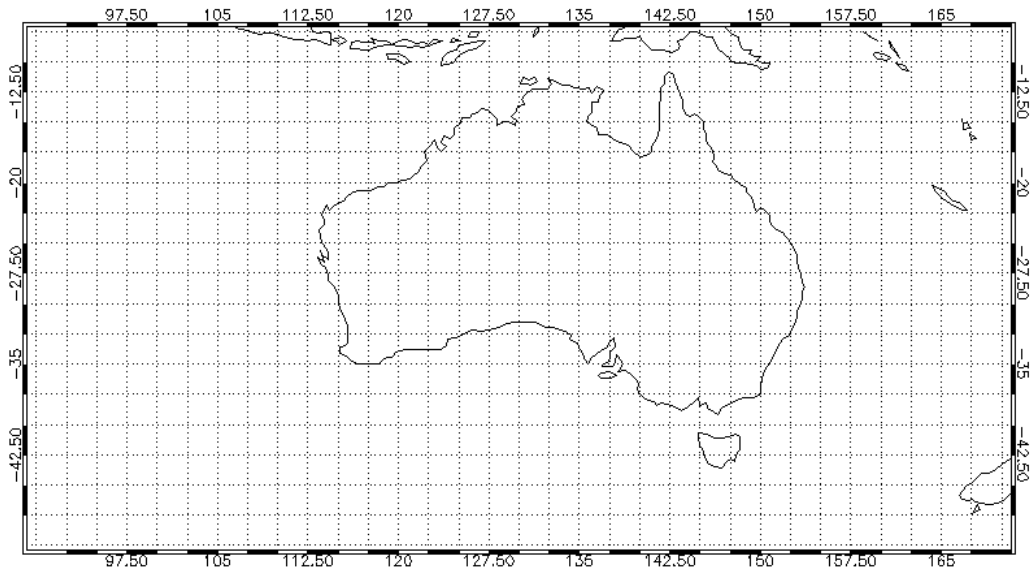
Figure 2: METANAL Grid



NCEP Re-Analysis Dataset

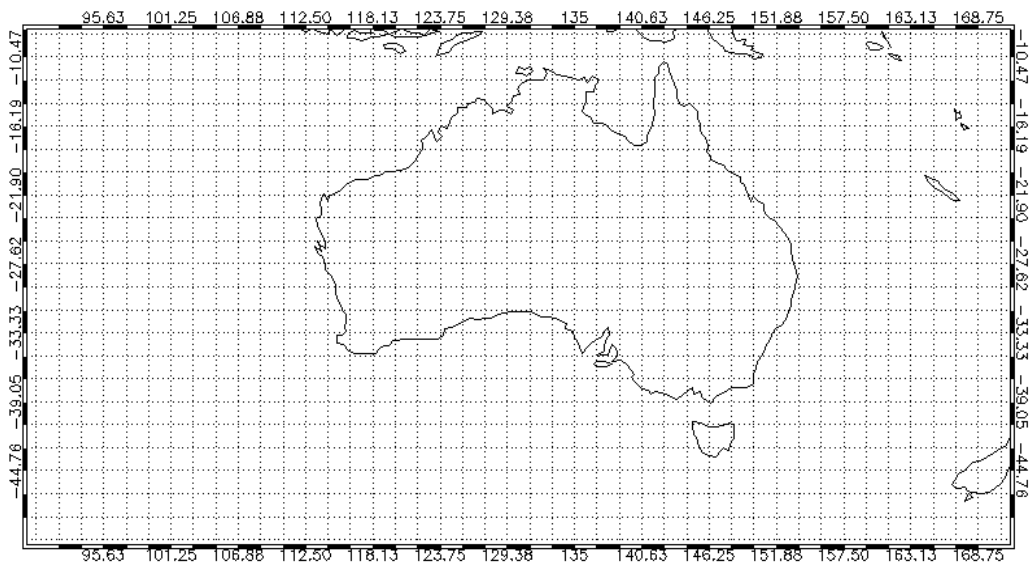
The NCEP re-analysis dataset for the Australian region has been supplied by Bertrand Timbal (BMRC) and covers the period 1 January 1948 to 31 December 2001. The NCEP grids contain a history of 00UTC, 06UTC, 12UTC and 18UTC analyses at a resolution of 2.5° over a specific (90E-170E, 50S-7.5S) geographical region for a variety of fields (i.e. mean sea level pressure, 850 hPa temperature, 1000 hPa and 500 hPa height and wind, and precipitable water). The NCEP grid is presented in Figure 3.

Figure 3: NCEP Grid



The NCEP grids (covering the period 1 January 1948 to 31 December 2001) also contain a history of 00UTC, 06UTC, 12UTC and 18UTC outgoing longwave radiation analyses at a resolution of 1.875° x 1.905° over a specific (90E-170.625E, 50.4752S-8.5652S) geographical region. The NCEP OLR grid is presented in Figure 4.

Figure 4: NCEP OLR Grid



The global NCEP re-analysis dataset has been supplied by David Jones (NCC) and covers the period 1 January 1979 to 31 December 1999. The NCEP2-Global grids contain a history of 00UTC, 06UTC, 12UTC and 18UTC mean sea level pressure analyses at a resolution of 2.5° globally (0E-360E, 90S-90N).



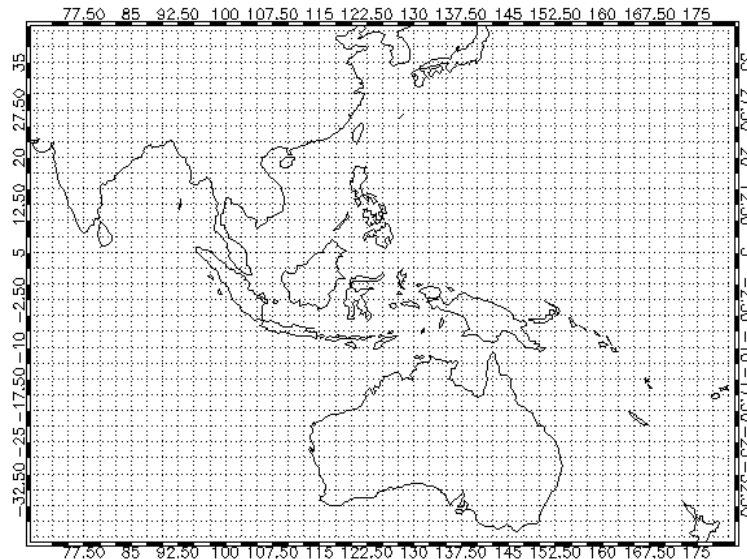
The NCEP2 grids contain a history of 00UTC, 06UTC, 12UTC and 18UTC mean sea level pressure analyses at a resolution of 2.5° over a specific (90E-170E, 50S-9.5S) geographical region. The NCEP 2 grid is identical to the NCEP grid (see Figure 3).

NOAA Dataset

The interpolated outgoing longwave radiation (OLR) data has been provided by the NOAA-CIRES Climate Diagnostics Center. The NOAA Interpolated OLR data cover the period 1 June 1974 to 31 August 2002. The NOAA-Global grids contain a history of 00UTC interpolated outgoing longwave radiation grids at a resolution of 2.5° globally (0E-357.5E, 90S-90N).

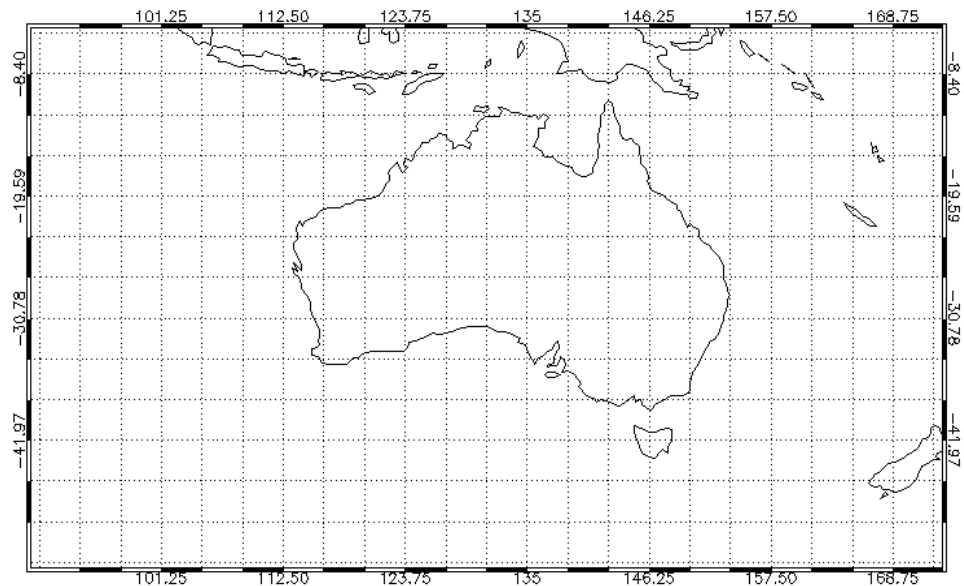
The NOAA grids contain a history of 00UTC interpolated outgoing longwave radiation grids at a resolution of 2.5° over a specific (70E-180E, 40S-40N) geographical region. The NOAA grid is presented in Figure 5.

Figure 5: NOAA Grid



CSIRO-GCM Dataset

The CSIRO-GCM dataset for the Australian region has been supplied by Debbie Abbs (CSIRO Atmospheric Research) and covers a simulated 140-year period. The GCM grids contain a history of 00UTC grids at a resolution of approximately 3.75° over a specific (90E-172.5E, 53.16S-4.66S) geographical region for a variety of fields (i.e. mean sea level pressure, sigma-levels 0.995, 0.840, 0.720 and 0.541 wind and mixing ratio). The GCM grid is presented in Figure 6.

Figure 6: GCM Grid

Tropical Cyclones

Cyclone data has been downloaded from the Bureau of Meteorology's external website. This dataset contains details at (generally) six hourly intervals of cyclone position, pressure, wind speed and other information. The date, time, latitude and longitude of all cyclones in the Australian region has been extracted from this dataset. The position of any historical tropical cyclone in the Australian region can be displayed.

Synoptic Types

The synoptic types from the synoptic classification system for southeastern Australia first referred to by Treloar and Stern (1993) can be displayed. The basis for these synoptic classes, or types, is the direction, strength, and curvature of the surface flow. These characteristics are determined from a grid of pressure values.

The synoptic types from the Synoptic Typer (Dahni, 2003) can also be displayed. Objective synoptic typing is performed using a pattern recognition scheme with fields of mean sea level pressure (MSLP). Principal components are first computed to represent the features of the MSLP fields. Reducing the dimensionality of the dataset, the derived variables based on these principal components are then fed to a K-means unsupervised clustering scheme to derive the synoptic types.

Synoptic types from other methodologies (e.g. correlation-based map-pattern classification) can be readily converted and/or displayed.

Weather Variables

Weather variable data can be displayed.



Heat Wave

The heat wave data for Melbourne and Hobart has been derived from daily maximum temperatures extracted from ADAM. A heat wave has been defined for Melbourne and Hobart when the temperature on at least 3 consecutive days has reached or exceeded a threshold value (i.e. 35.0 °C and 27.0 °C for Melbourne and Hobart respectively). The severity of the heat wave has been represented by the accumulated number of degrees above the threshold (i.e. maximum temperature – threshold value) calculated for each heat wave day.

Wave Height

The wave height data (i.e. significant wave height peaks for waves above 5 metres) for the New South Wales offshore waverider buoys has been supplied by Rosea Kemp (NSW CCS).

References

1. Dahni, R.R., 2003: An automated synoptic typing system using archived and real-time NWP model output, 19th International Conference on Interactive Information Processing Systems for Meteorology, Oceanography and Hydrology, Amer. Meteor. Soc., Long Beach, California, 9-13 February, 2003.
2. Treloar, A.B.A. and Stern, H., 1993: A climatology and synoptic classification scheme of Victorian severe thunderstorms, Preprints, 4th International Conference on Southern Hemisphere Meteorology and Oceanography, Hobart, Australia, March 29-April 2, 1993.

Appendix A – Map Browser System Dataflow

The Map Browser system dataflow is presented in Figure 7.

Figure 7: Map Browser System Dataflow

