



Australian Meteorological Association Inc (AMETA)
 25 College Road, Kent Town, SA, 5071
 Hon Sec - Email: d.ray@bom.gov.au

4.30pm, Monday 12 October 2009

Venue: Bureau of Meteorology (ground floor)
 25 College Road, Kent Town

Subject: Fire Weather System.

Speakers: Duncan Tippins

As manager of the Severe Weather Section at the South Australian Regional Office of the Bureau of Meteorology, Duncan will talk about the changes to the Fire Weather System post Victorian bushfires.

We look forward to seeing you.
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AMETA

THE NEWSLETTER OF THE AUSTRALIAN METEOROLOGICAL
 ASSOCIATION INC
 October 2009



Dr. Jochen Kaempff
 Associate Professor at Flinders University,
 Head of the Ocean and Climate Science discipline.

News from the Desalination Front.

In his interesting and thought provoking talk entitled "News from the Desalination Front", Jochen presented his findings and recommendations in regards to the modelling of the impacts of planned large-scale seawater desalination plants in our local gulf systems, and possible threats to the unique marine ecosystem of the region.

BHP Billiton has planned for a desalination plant to be situated at Point Lowly near Whyalla. The main purpose of this plant is to produce enough water to supply the proposed expansion of it's Olympic Dam operations, however considerable concern has been expressed concerning the environmental issues associated with this very unique ecosystem.

One important concern is that the discharge of brine from the desalination plant may not properly disperse, and so



under certain conditions could produce some very negative impacts on the local environment. This would particularly impact on cuttlefish eggs and their ability to survive in these conditions and would also have impacts on the lifecycles of many other species, including some commercially important fish stocks.

Between May and August each year, hundreds of thousands of these cuttlefish arrive to mate and spawn. They are attracted to the area around Point Lowly where they can attach their eggs to the rocky surfaces in this region.

The Upper Spencer Gulf has a much longer flushing time (> 1 year) compared with other parts of the gulf. [Kämpf et al. (Desalination & Water Treatment, 2009)] It is this slow flushing which supports the unique and rare marine habitat which must be protected from the discharge of the deoxygenated desalination brine. In an enclosed water body such as Spencer Gulf the water age is very much related to the salinity levels and the water temperatures recorded.

Jochen, along with several other Flinders University researchers, found that there is a very possible threat of the formation of deoxygenated brine underflows which can have quite devastating impacts on the marine environment. They also found



The Lowly Point Lighthouse stands out on a point jutting into the northern end of the Spencer Gulf.

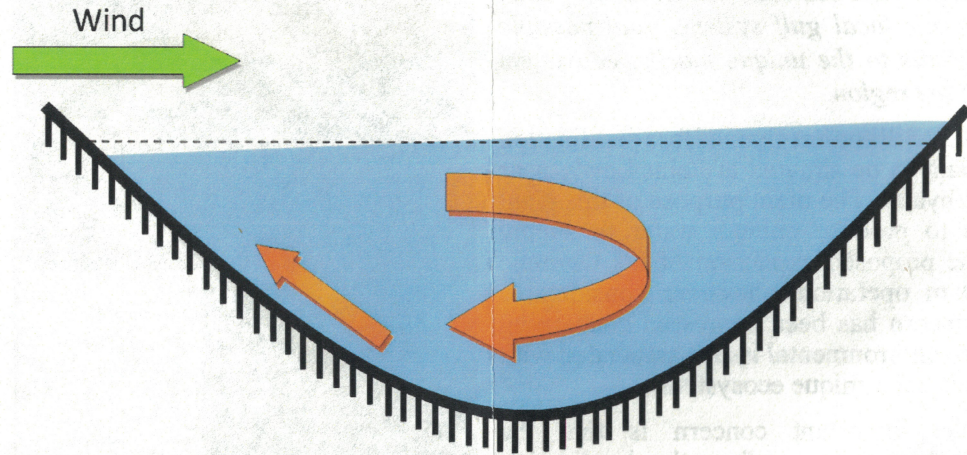
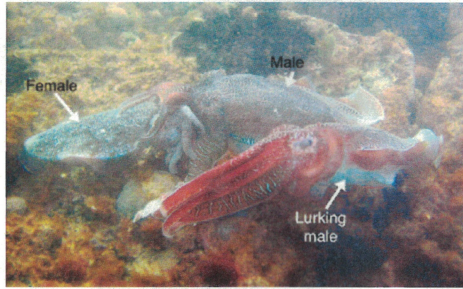


Figure 5: Illustration of the direct upwelling process in shallow waters.

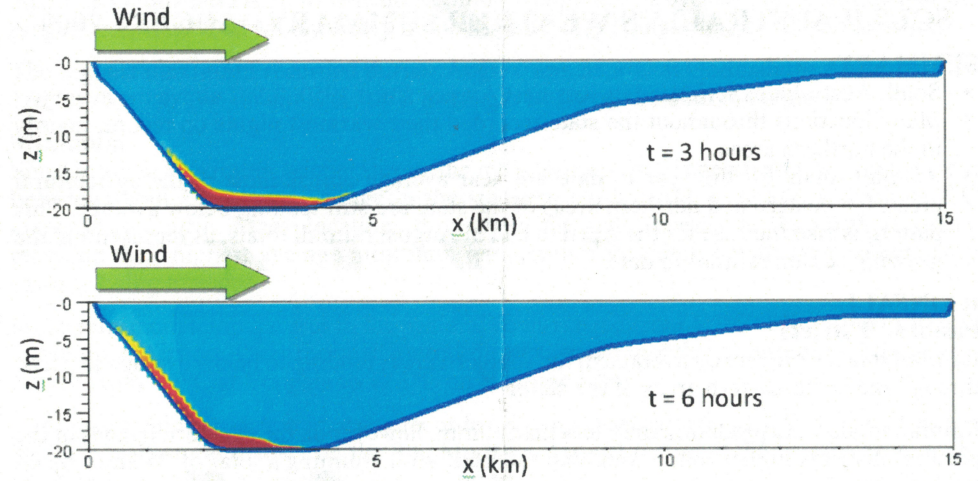
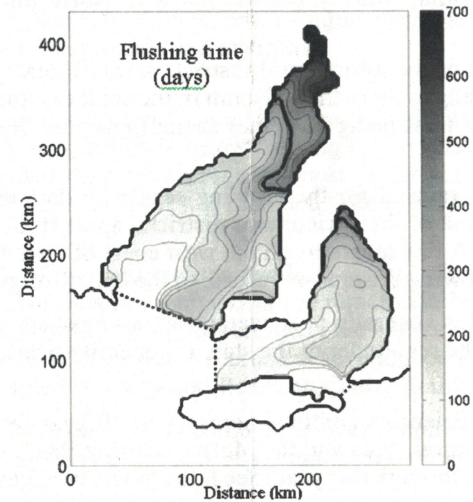


Figure 6: Simulation of direct wind-driven upwelling of toxic brine (red shading) into shallow waters. Red shading corresponds to salinity anomalies exceeding 1 g/kg.



through independent hydrodynamic modelling that there is a distinct possibility of upwelling of toxic brine into shallower near-shore regions, a scenario which would pose serious problems for the long term survival of a number of marine species and in particular the Giant Australian Cuttlefish.

Illustrations courtesy Assoc Prof Jochen Kaempf Presentation - "It's Crunch Time for Upper Spencer Gulf – A critical review of BHP Billiton's EIS"

SOUTH AUSTRALIA'S WEATHER SUMMARY - AUGUST 2009

SUMMARY

- South Australia experienced its warmest August since 1950, 3.1°C above the average.
- Many locations throughout the state recorded their warmest nights on record, mainly in the northern areas.
- Rainfall totals for the year to date are near average across most of the agricultural areas, but eastern and northern areas of the state are still tending below average. This pattern is also the case for the April to end of August rainfall totals, as representing the growing season rainfall to date.

RAINFALL

Pastoral Districts

Rainfall totals were mostly average in the southern areas tending to below average in parts, through the north-eastern areas of the state.

Rainfall totals were predominantly less than 10mm, however on the southern fringes of the pastoral districts higher totals were experienced, with Nonning's total of 26.8mm being the highest.

Agricultural Districts

Rainfall totals were generally average across the southern agricultural areas, with most of the Western Agricultural, Murray Mallee and Mid North districts receiving below average.

Over the northern parts of the agricultural districts rainfall totals were between 10 and 25mm gradually increasing to more than 100mm in the southern and higher elevated parts of the state. The highest total being 164.8mm at the Lenswood Research Station, in the Mount Lofty Ranges.

Across the longer term, rainfall for the growing season to date is generally average or above average across most of the agricultural districts, apart from the some areas of the Murray Mallee district. A few locations on the west coast of Eyre Peninsula are tracking in the wettest 15% of growing seasons on record, to the end of August.

The year to date rainfall is generally near average across most agricultural districts apart from in the east, while the remainder of the state is generally below average to the end of August.

Longer term rainfall deficiencies continue across 2 to 10 year rainfall averages for the South Australian agricultural areas and the Murray Darling Basin, which has seen below average rainfall continue through this year (See http://www.bom.gov.au/cgi-bin/silo/rain_maps.cgi).

TEMPERATURE

Looking at the August records since 1950, state-wide the monthly mean August temperature (the average of the maximum and minimum temperatures) was 2.0°C above the average for the South Australian agricultural areas. For South Australia as a whole the monthly mean August 2009 temperature was the highest on record with 3.1°C above average.

Maximum

The mean maximum temperatures for August graded from 1°C above average in the Lower Southeast district to more than 4°C above average in the north of the state. Oodnadatta and Loxton recorded their highest average maximum temperatures for August.

In the Pastoral districts mean maximum temperatures ranged from 19.2°C at Yunta to

26.5°C at Oodnadatta Airport. Mean maximum temperatures over the Agricultural districts ranged from 11.9°C at Mount Lofty in the Mount Lofty Ranges to 22.1°C at Nullarbor.

The highest maximum recorded during August was 35.3°C at Oodnadatta Airport on the 15th of August. The lowest was 7.5°C at Mount Lofty on the 24th of August.

Minimum

Similar to the maximum temperatures, the mean minimum temperatures for August were between about 1°C above average in the southern parts of the state and as high as 4°C above in the north. Many locations throughout the state, mainly in the northern areas, recorded their highest average minimum temperature for August with many others very close to being a record.

Mean minimum temperatures in the pastoral areas ranged from 5.5°C at Nonning to 10.9°C at Moomba Airport. Over the agricultural districts mean monthly minimum temperatures ranged from 3.8°C at Yongala to 12.1°C on Neptune Island.

The lowest minimum temperature recorded during August was -3.4°C at Yunta in the North East Pastoral district on the 8th. Moomba Airport recorded the warmest overnight temperature with 21.5°C on the 29th of August.

ADELAIDE REGION'S WEATHER

SUMMARY

- 6th highest average temperature in 121 years.
- Very warm nights in Adelaide, with warmest August nights since 1993.
- Near average rainfall for Adelaide and environs.

RAINFALL

The rainfall at the South Australian Regional Office, Kent Town, for August 2009 was 55.8mm recorded on 16 days, which is below the long term average of 67.1mm. Although the rainfall was below the long term average the most recent year that recorded less than this month was in 2007 when 25.8mm was recorded. The lowest August rainfall occurred in 2006 with 11.4mm.

Over the northern areas of the metropolitan and hills regions the rainfall recordings were slightly below average, but mostly average over the remainder. Most suburbs of Adelaide received between 40 and 60mm during August. Over the higher parts of the Adelaide Hills rainfall totals in excess of 120mm were recorded at several locations. The highest rainfall total was 164.8mm recorded at Lenswood Research Centre in the Adelaide Hills.

For the first eight months of the year 376.8mm have been recorded at the South Australian Regional Office. The long-term average is 384.9mm for the same period.

TEMPERATURE

The average temperature over metropolitan Adelaide and adjacent hills area was above average for August, grading from 1.1°C above over the northern suburbs to 1.6°C above the long-term average over the southern suburbs. In the Adelaide Hills region the average temperature was about 1.7°C above the long-term average. The average temperature recorded at the South Australian Regional Office was 13.8°C which is the 6th highest August average temperature since official records began in 1887. The most recent warmer August was in 1993.

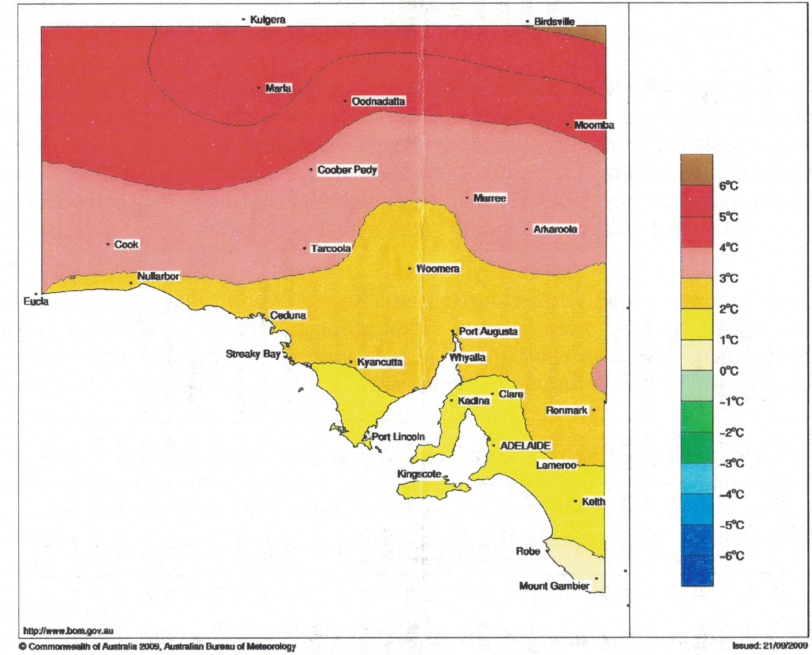
The mean maximum temperature recorded at the South Australian Regional Office (Kent Town) for August 2009 was 18.3°C, which is 1.6°C above the long-term mean maximum temperature. Last year, in contrast, was 1.9°C below the long-term August mean maximum temperature.

The hottest maximum temperature recorded in the Adelaide metropolitan and hills area was 26.7°C on the 15th at the South Australian Regional Office (Kent Town).

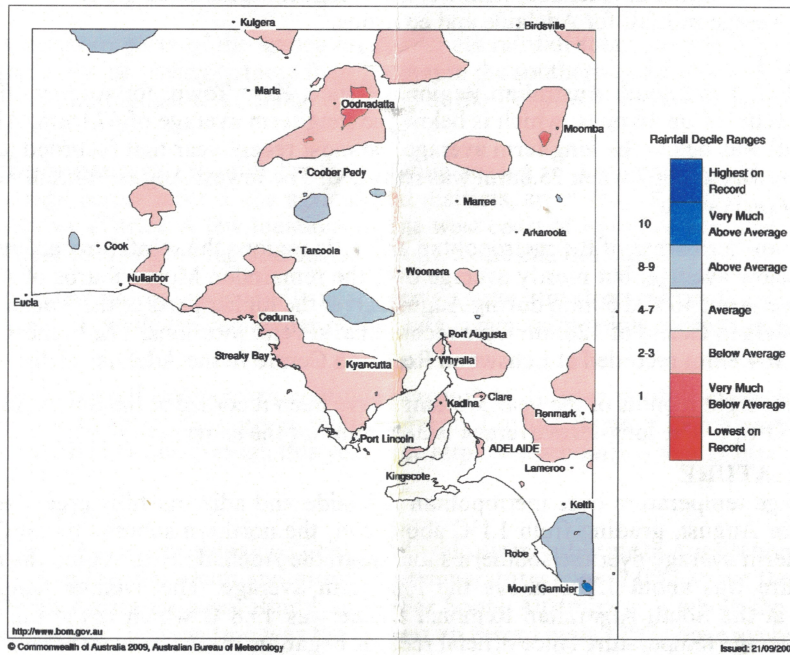
The mean minimum temperature for August 2009 at the South Australian Regional Office (Kent Town) was 9.4°C, which is 1.2°C above the normal August mean minimum temperature of 8.2°C. This is the equal 3rd highest August average minimum temperature during the past 121 years, the highest being 10.3°C in 1959, at the South Australian Regional Office. The lowest recorded average minimum temperature is 6.4°C in 1943. August, last year, the mean minimum temperature was 6.5°C.

The coldest minimum temperature recorded in the Adelaide metropolitan and hills area was -0.5°C on the 8th at Mount Barker, whilst the warmest night was 14.8°C at Noarlunga, on the 15th.

Maximum Temperature Anomaly (°C) August 2009
Product of the National Climate Centre



South Australian Rainfall Deciles August 2009
Distribution Based on Gridded Data
Product of the National Climate Centre



Minimum Temperature Anomaly (°C) August 2009
Product of the National Climate Centre

