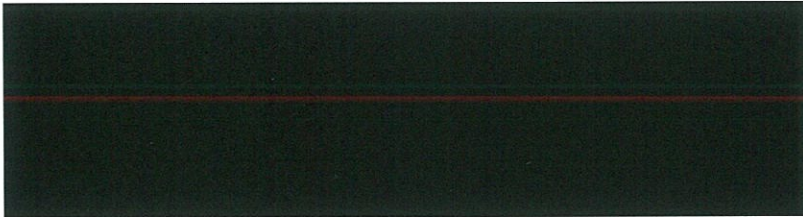


SEVERE WEATHER SUMMARY FOR 2010/11

Severe Thunderstorm Warning Service

Overview of the season



The Probability of Detection for both Regional and Detailed Severe Thunderstorm warnings bounced back from a dip for the previous season, and show an overall trend towards improvement (Figure 2.17 in Performance Summaries). The False Alarm Ratio for both Regional and Detailed Severe Thunderstorm Warnings remained consistent with recent past seasons (Figure 2.18 in Performance Summaries). The ongoing high FAR values are largely a reflection of the verification procedure, where each weather district covered by a particular warning counts as a missed event if no damaging thunderstorm occurred there.

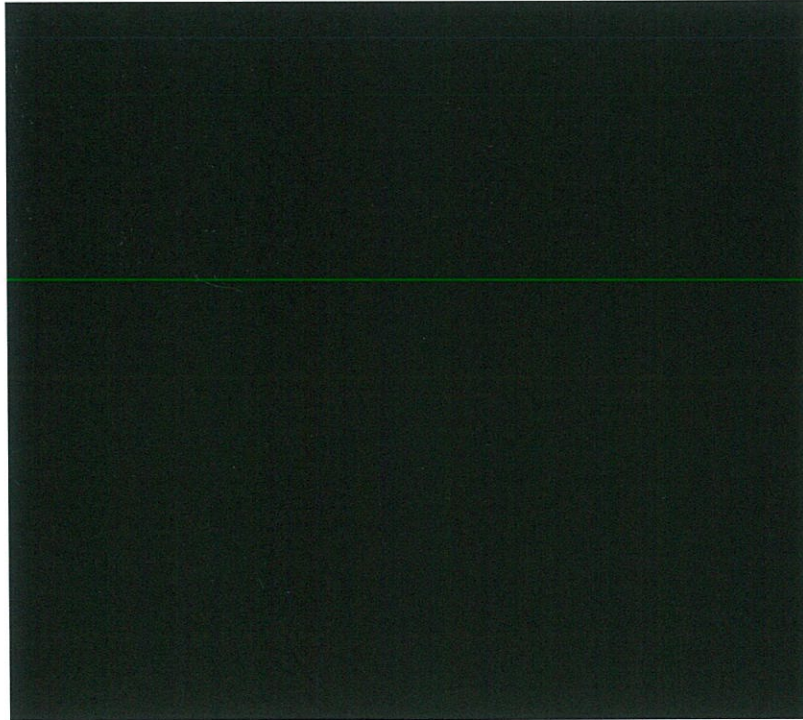
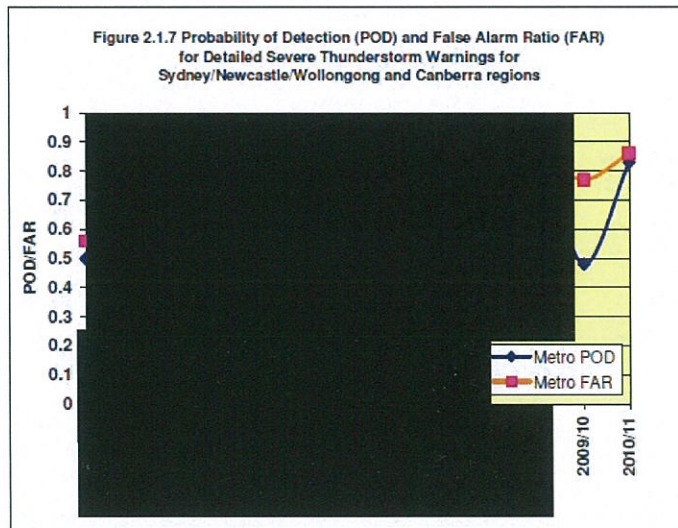


Table 2.1.2: Warning of Weather Conditions Likely to Endanger Life or Property - Severe Thunderstorm Warning Services

	Performance Measure	Target 2010-11	Actual 2010-11
Quality	POD for Metro Thunderstorm Warning	0.7	0.83
	FAR for Metro Thunderstorm Warning - see Fig. 2.1.7 for T/storm Warnings	0.4	0.86
	POD for Regional Thunderstorm Warning	0.7	0.83
	FAR for Regional Thunderstorm Warning - see Fig. 2.1.8 for Regional TS Warnings	0.4	0.87
	State/Territory emergency authorities satisfied/very satisfied with Bureau services	Yes	Yes
	Read Overview of the Season about qualifications relating to the above performance statistics.		
Quantity	No. Regional T/storm Warnings issued	N/A	390 (97 days)
	No. Metro Thunderstorm Warnings issued	N/A	77 (18 days)



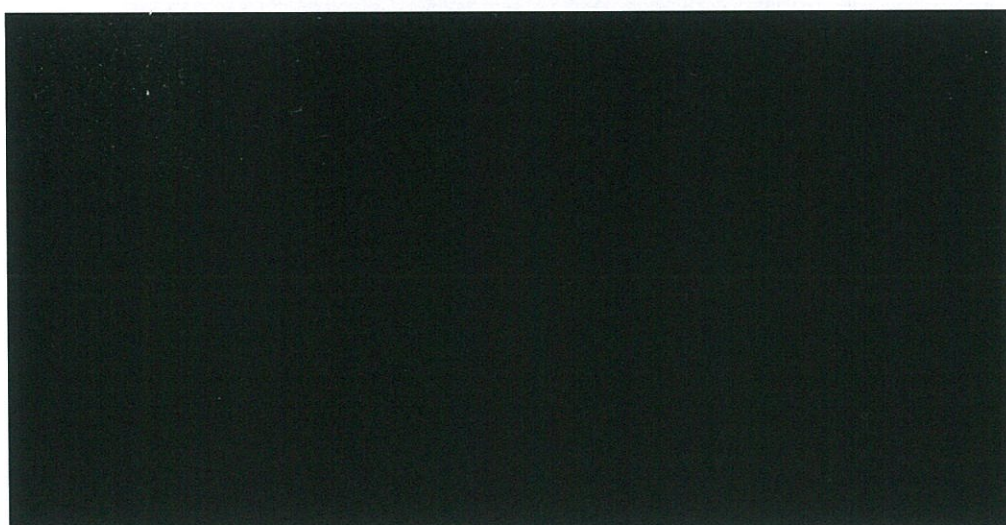
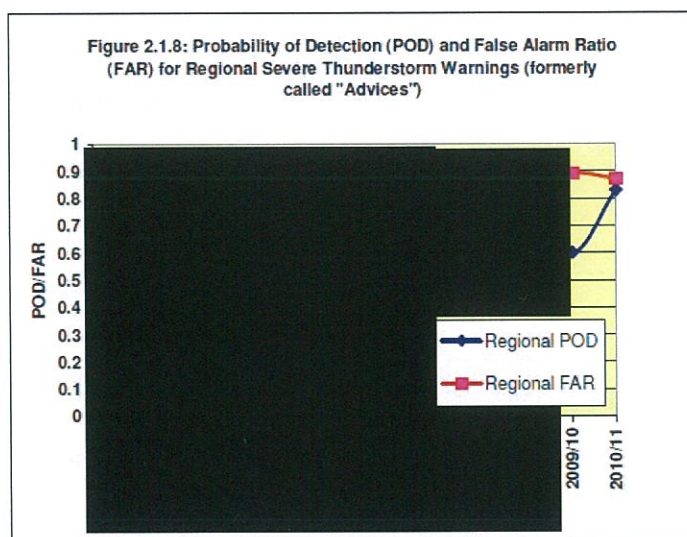
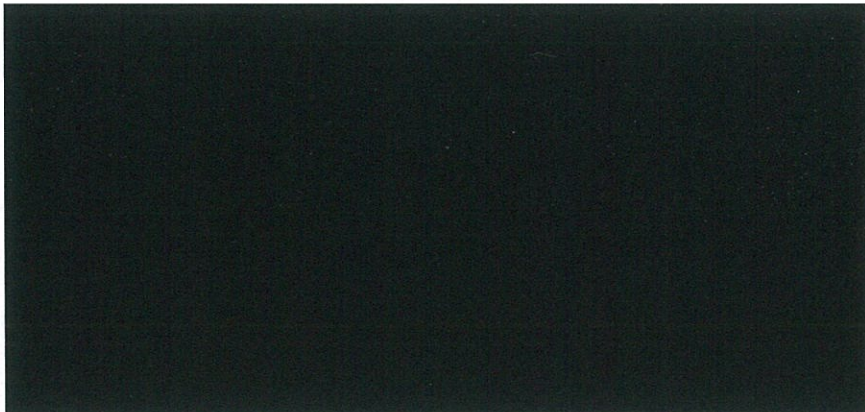


Table 2.1.2: Warning of Weather Conditions Likely to Endanger Life or Property - Severe Thunderstorm Warning Services

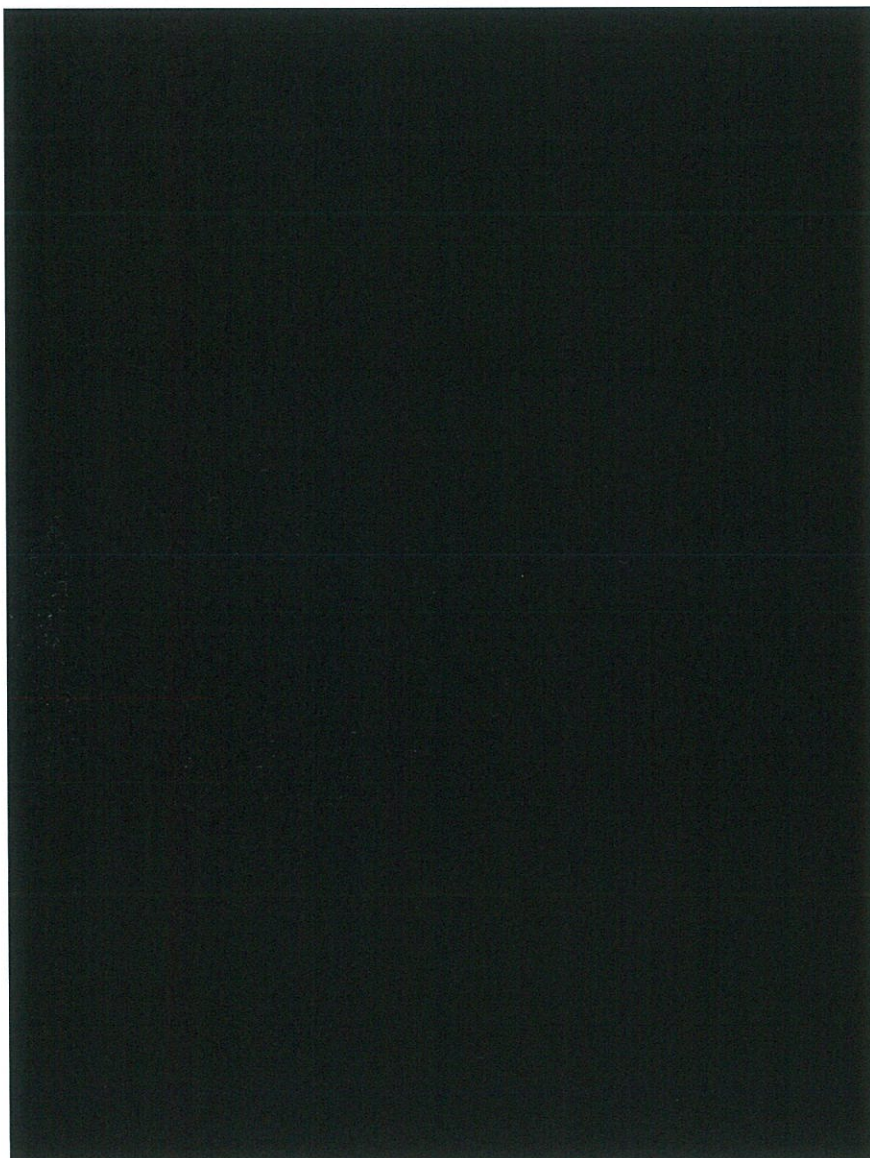
	Performance Measure	Target 2009-10	Actual 2009-10
Quality	POD for Metro Thunderstorm Warning	0.7	0.48
	FAR for Metro Thunderstorm Warning - see Fig. 2.1.7 for T/storm Warnings	0.4	0.77
	POD for Regional Thunderstorm Warning	0.7	0.61
	FAR for Regional Thunderstorm Warning - see Fig. 2.1.8 for Regional TS Warnings	0.4	0.89
	State/Territory emergency authorities satisfied/very satisfied with Bureau services	Yes	Yes
	Read Overview of the Season about qualifications relating to the above performance statistics.		
Quantity	No. Regional T/storm Warnings issued	N/A	299 (93 days)
	No. Metro Thunderstorm Warnings issued	N/A	55 (17 days)

Overview of the Season



The Probability of Detection for both Regional and Metropolitan Severe Thunderstorm warnings were the lowest for some time. The Metropolitan POD should be put in context with the actual events. Many of the reports of severe weather inside the Metropolitan Warning area that were not covered by a severe thunderstorm warning were very marginal in severity. These events did not attract any significant media attention and it is the warning performance for the clear cut severe thunderstorm events that define the public perception of warning performance over a season.

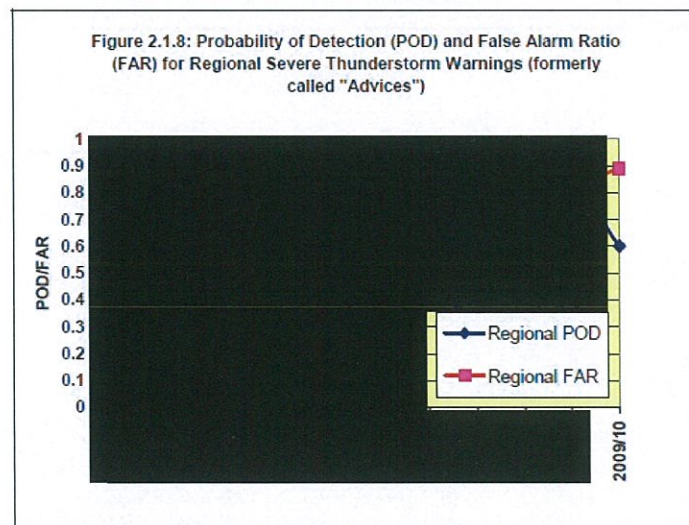
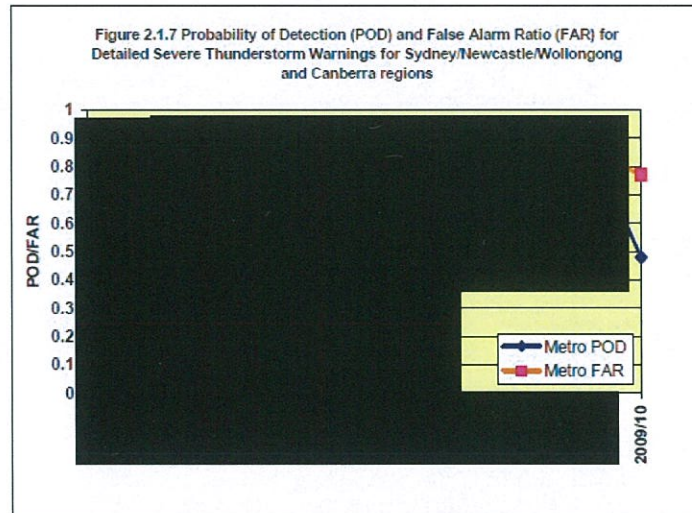




Overall performance:

Figures 2.1.7 and 2.1.8, on the next page, shows a significant reduction in the POD achieved for both regional and detailed warnings in 2009/10. This is a departure from the long term trend of improving POD for both regional Severe Thunderstorm Warnings (formerly "Advises") and Metropolitan Severe Thunderstorm Warnings (including Canberra) over time. The FAR remained

consistently high and inline with past seasons. The FAR is largely a reflection of the verification procedure, where each weather district covered by a particular warning counts as a missed event if no damaging thunderstorm occurred there.



2010:11 STS Verification Statistics

Note: NSW did not provide lead-time data, so estimates were inserted based on the national average across the other Regions

Whole Region	(inc ACT)	
Events	111	
Warn/Adv	467	
CAPITAL	NSW	
HITS	10	
MISSES	2	
F.ALARMS	49	
Warnings	22	
Events	12	
Mean Lead Time	55.8	minutes
COUNT	10	
POD	83%	
FAR	83%	
Lead times (min)	67	
(max 5 hours)	67	
	67	
	67	
	67	
	67	
	67	
	67	
	67	
	67	
	67	
	67	
	67	

2009:10 STS Verification Statistics

Whole Region	(inc ACT)	
Events	96	
Warn/Adv	522	
CAPITAL	NSW	
HITS	9	
MISSES	11	
F.ALARMS	34	
Warnings	44	
Events	20	
Mean Lead Time	13.0	minutes
COUNT	9	
POD	45%	
FAR	79%	
Lead times (min)	12	
(max 5 hours)	45	
	64	
	1	
	8	
	21	
	26	
	1	
	82	

2011:12 STS Verification Statistics

Still awaiting
NSW & [REDACTED]
data

	(inc ACT)	
Events		
Warn/Adv		
CAPITAL	NSW	
HITS		
MISSES	0	
F.ALARMS		
Warnings		
Events		
Mean Lead		
Time	#DIV/0!	minutes
COUNT	0	
POD	#DIV/0!	
FAR	#DIV/0!	
Lead times (min)		
(max 5 hours)		

From: [REDACTED]
Sent: Tuesday, 10 August 2010 12:32 PM
To: [REDACTED]
Subject: Annual report [SEC=UNCLASSIFIED]

[REDACTED],

I've changed a few paragraphs to quantify the storm stats for the season. The latest attachment should be good to go.

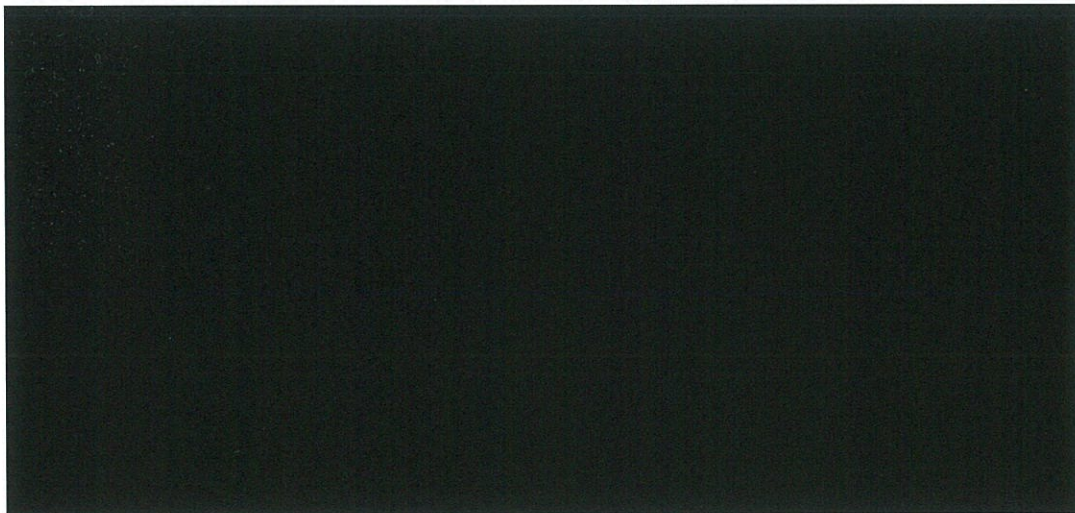
Cheers,

[REDACTED]

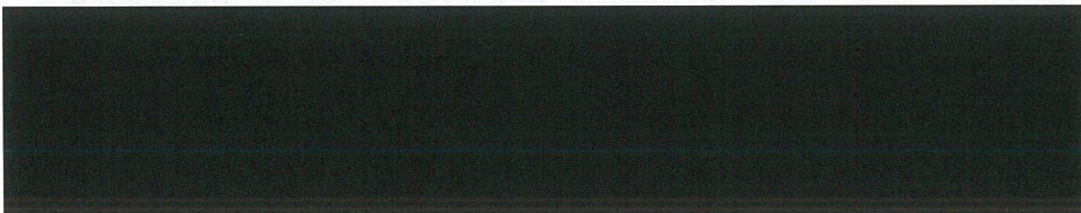
Table 2.1.2: Warning of Weather Conditions Likely to Endanger Life or Property - Severe Thunderstorm Warning Services

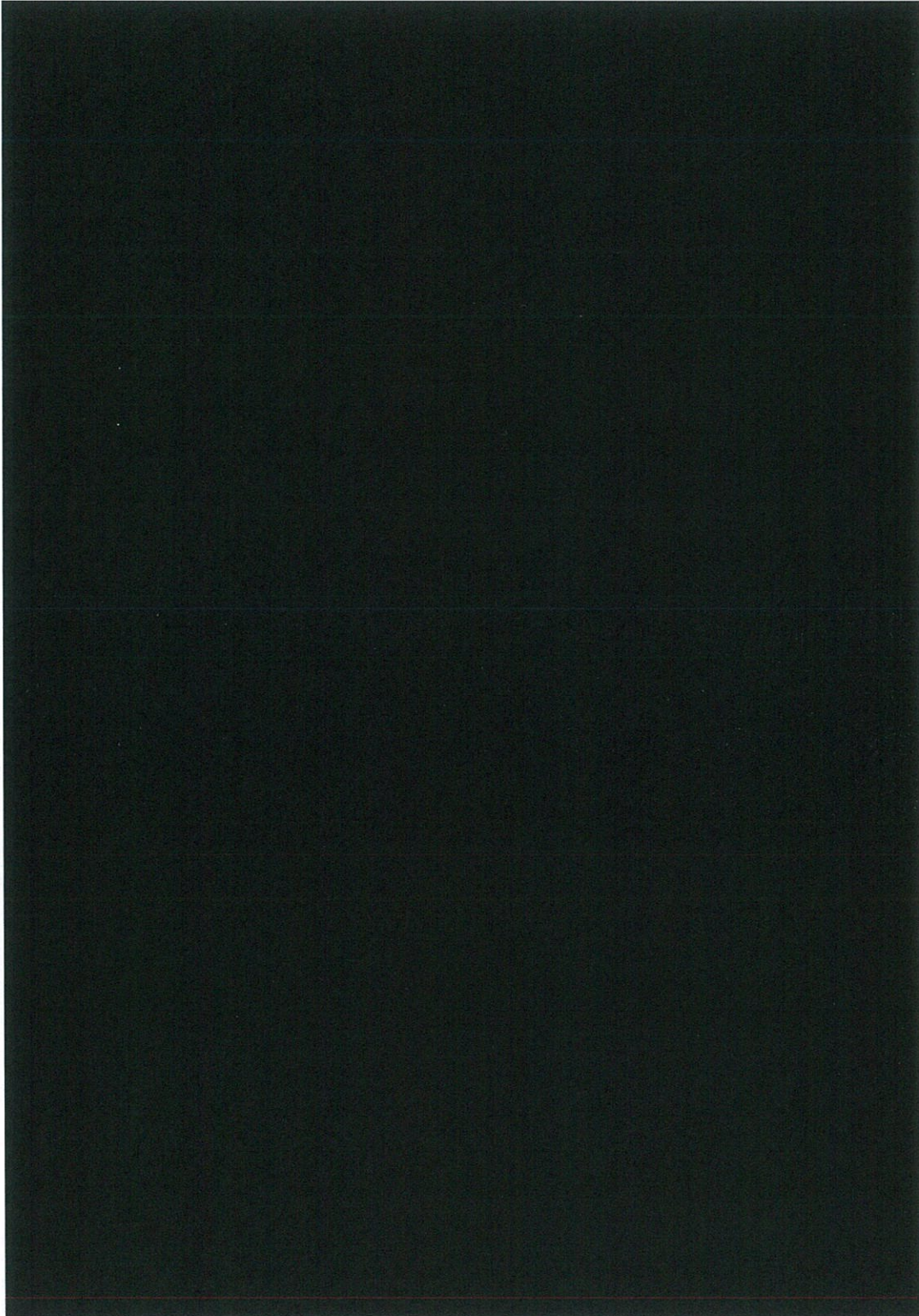
	Performance Measure	Target 2009-10	Actual 2009-10
Quality	POD for Metro Thunderstorm Warning	0.7	0.48
	FAR for Metro Thunderstorm Warning- see Fig. 2.1.7 for T/storm Warnings	0.4	0.77
	POD for Regional Thunderstorm Warning	0.7	0.61
	FAR for Regional Thunderstorm Warning- see Fig. 2.1.8 for Regional TS Warnings	0.4	0.89
	State/Territory emergency authorities satisfied/very satisfied with Bureau services	Yes	Yes
Quantity	No. Regional T/storm Warnings issued	N/A	299 (93 days)
	No. Metro Thunderstorm Warnings issued	N/A	55 (17 days)

Overview of the season



The Probability of Detection for both Regional and Metropolitan Severe Thunderstorm warnings were the lowest for some time. The Metropolitan POD should be put in context with the actual events. Many of the reports of severe weather inside the Metropolitan Warning area that were not covered by a severe thunderstorm warning were very marginal in severity. These events did not attract any significant media attention and it is the warning performance for the clear cut severe thunderstorm events that define the public perception of warning performance over a season.





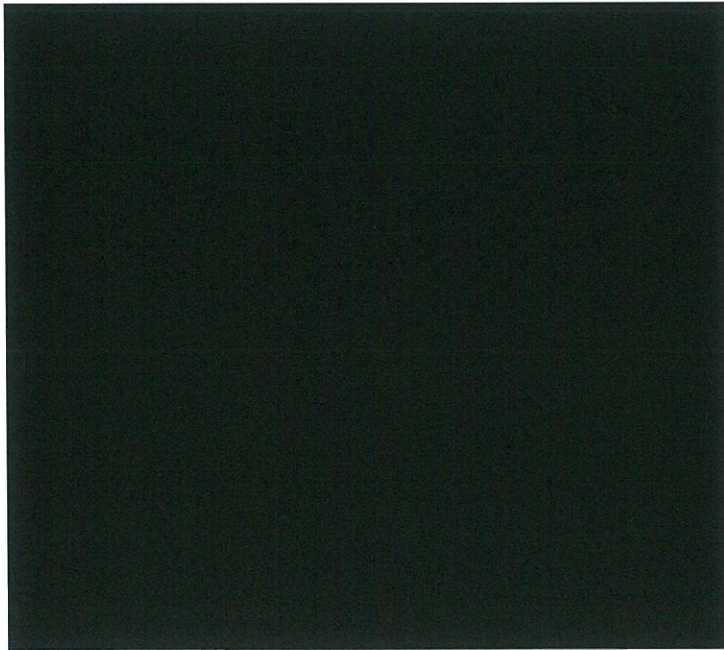
Overall performance:

Figures 2.1.7 and 2.1.8, on the next page, shows a significant reduction in the POD achieved for both regional and detailed warnings in 2009/10. This is a departure from the long term trend of improving POD for both regional Severe Thunderstorm Warnings (formerly “Advices”) and Metropolitan Severe Thunderstorm Warnings (including Canberra) over time. The FAR remained consistently high and inline with past seasons. The FAR is largely a reflection of the verification procedure, where each weather district covered by a particular warning counts as a missed event if no damaging thunderstorm occurred there.

█ these are the numbers you need to generate the two remaining graphs below. Last you asked for these to be provided and whipped the graphs up yourself so I have gone with the same idea this year, █.

		09/10
Regional POD		0.61
Regional FAR		0.89

		09/10
Metro POD		0.48
Metro FAR		0.77



From: [REDACTED]
Sent: Monday, 1 August 2011 8:43 AM
To: [REDACTED]
Subject: [REDACTED] TS for annual report [SEC=UNCLASSIFIED]

[REDACTED],

Attached is the Sev Wx section for the Annual report as mentioned on Friday. Let me know if you want something else included.

[REDACTED]

**Warning of Weather Conditions Likely to Endanger Life or Property -
Severe Thunderstorm Warning Services**

Overview of the season

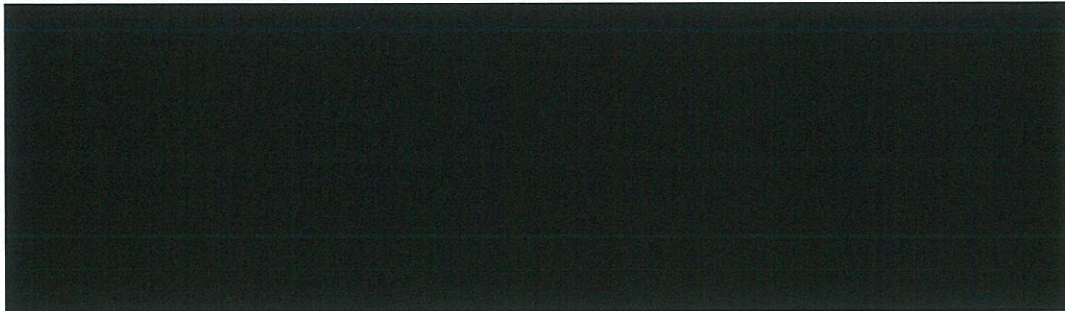
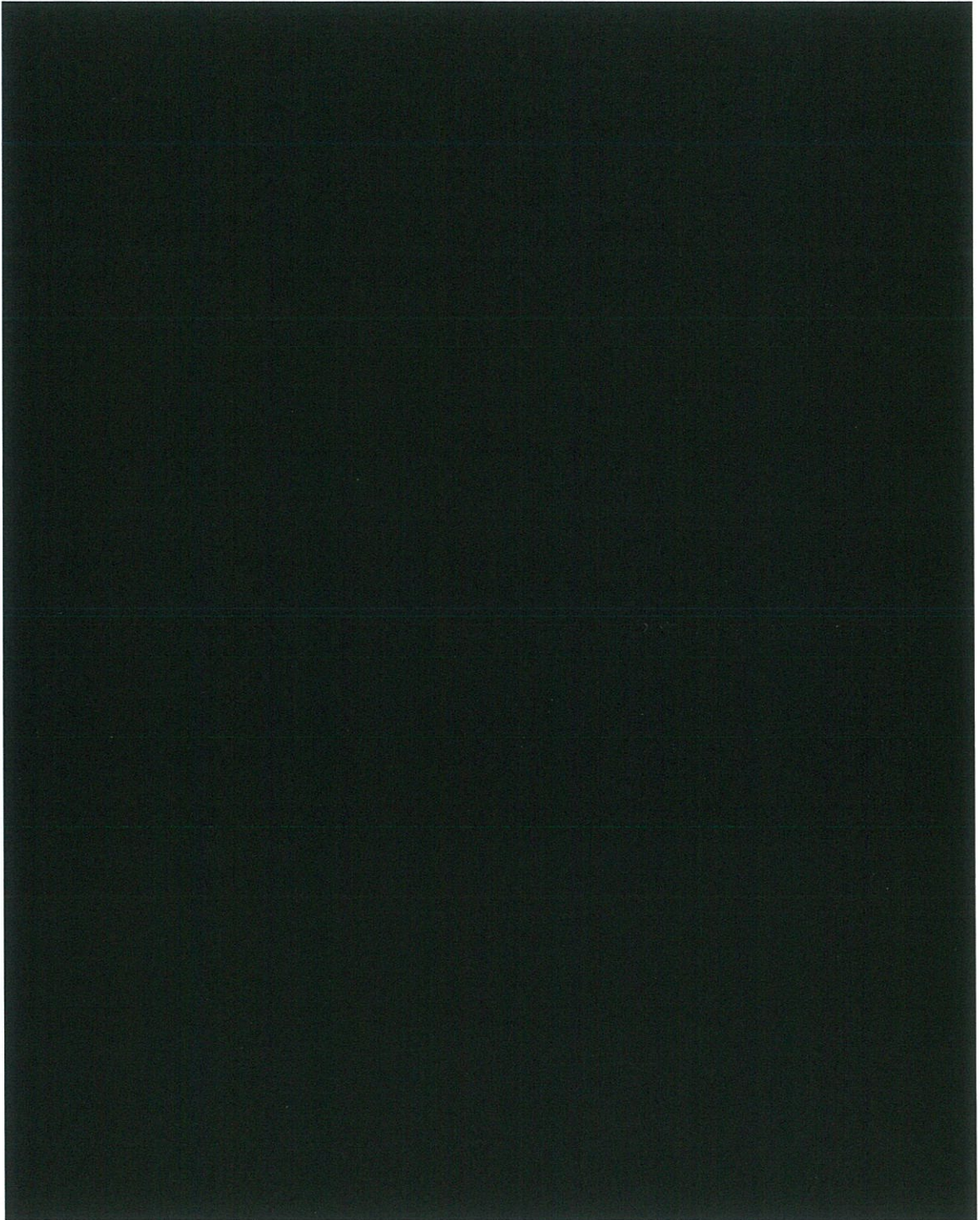


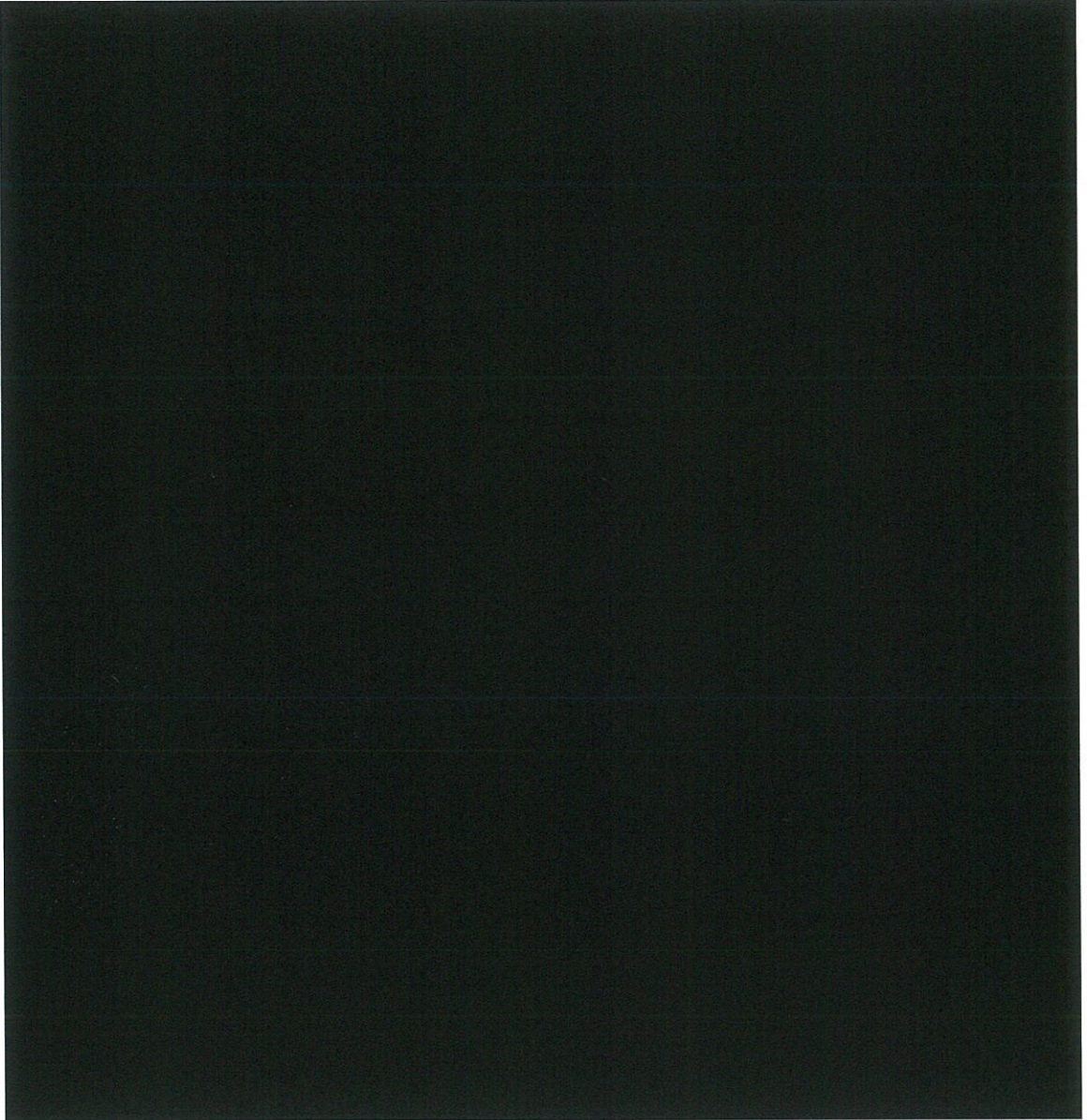
Table XX: Warning of Weather Conditions Likely to Endanger Life or Property – Severe Thunderstorm Warning Services.

	Performance Measure	Target 2010-11	Actual 2010-11
Quality	POD for Metro Thunderstorm Warning	0.7	0.83
	FAR for Metro Thunderstorm Warning	0.4	0.86
	- see Fig. 2.1.7 for T/storm Warnings		
	POD for Regional Thunderstorm Warning	0.7	0.83
	FAR for Regional Thunderstorm Warning	0.4	0.87
	- see Fig. 2.1.8 for Regional TS Warnings		
	State/Territory emergency authorities satisfied/very satisfied with Bureau services	Yes	Yes
Quantity	No. Regional T/storm Warnings issued	N/A	390 (97 days)
	No. Metro Thunderstorm Warnings issued	N/A	77 (18 days)

The Probability of Detection for both Regional and Detailed Severe Thunderstorm warnings bounced back from a dip for the previous season, and show an overall trend towards improvement (**Figure xx in Appendix**). The False Alarm Ratio for both Regional and Detailed Severe Thunderstorm Warnings remained consistent with recent past seasons (**figure XX in Appendix**). The ongoing high FAR values are largely a reflection of the verification procedure, where each weather district covered by a particular warning count as a missed event if no damaging thunderstorm occurred there.







Graphs for Appendices – Severe Thunderstorm Warning Services

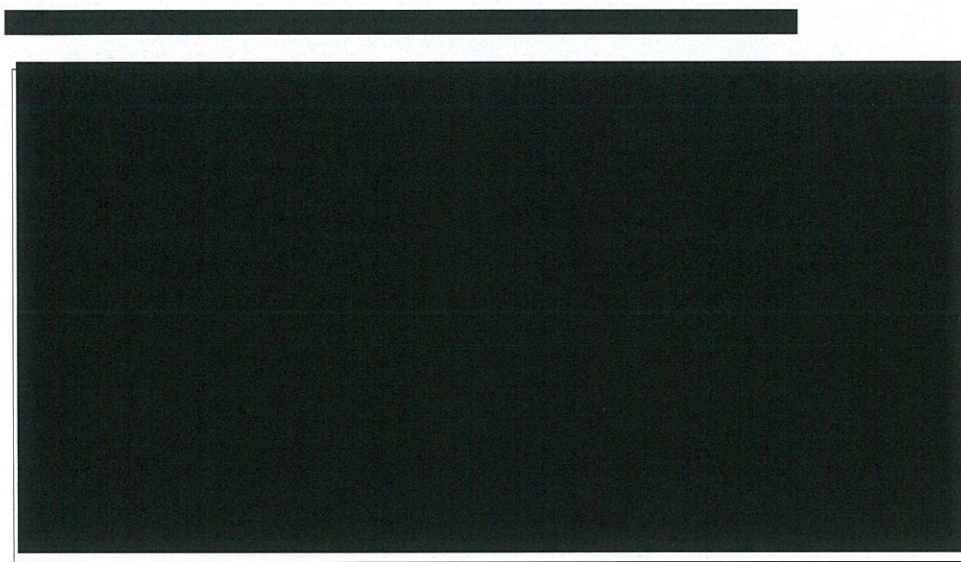


Figure XX: Probability of Detection (POD) and False Alarm Ratio (FAR) for Regional Severe Thunderstorm Warnings.

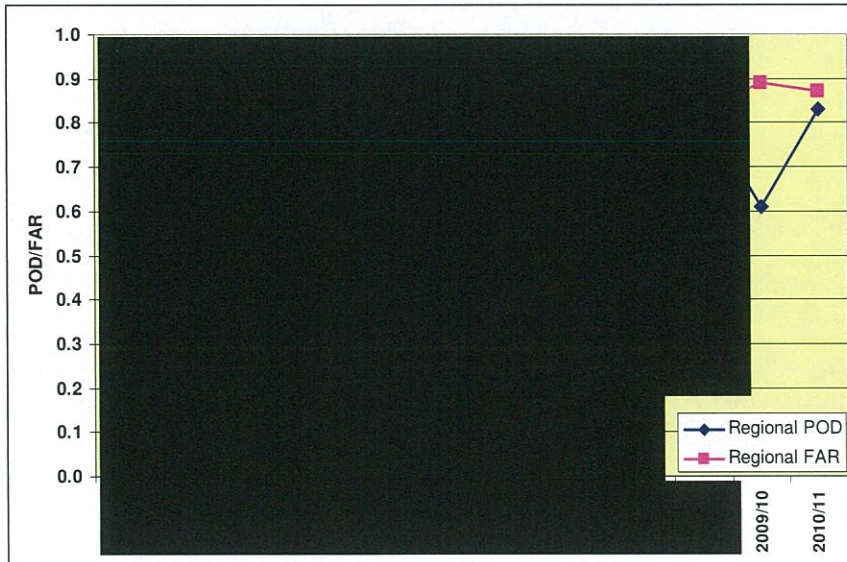
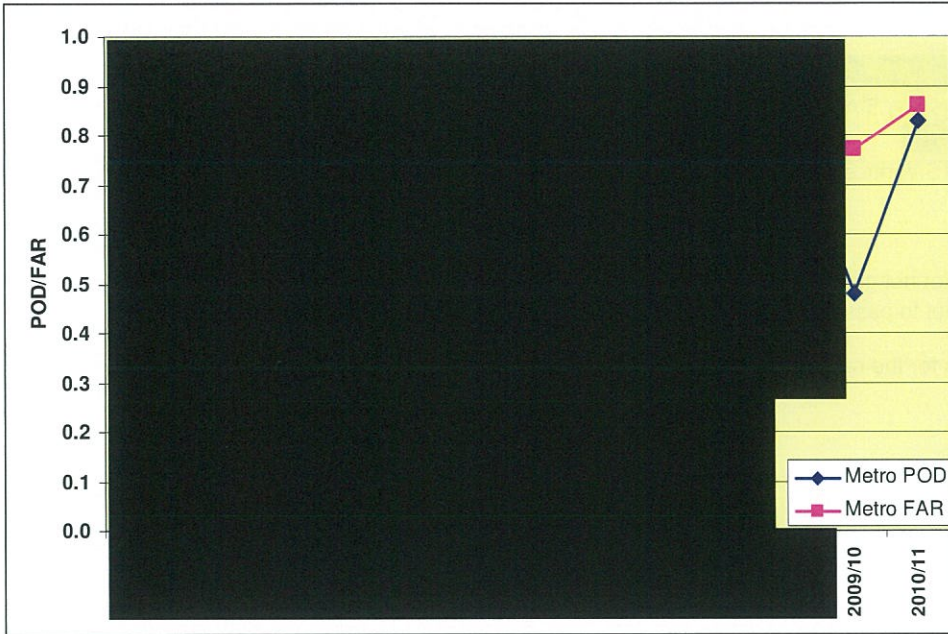


Figure XX: Probability of Detection (POD) and False Alarm Ratio (FAR) for Detailed Severe Thunderstorm Warnings for Sydney/Newcastle/Wollongong and Canberra regions.



From: [REDACTED]
Sent: Thursday, 5 August 2010 14:35
To: [REDACTED]
Subject: TS Verification [SEC=UNCLASSIFIED]

[REDACTED],

Apologies for not getting the data to you earlier. The stats have been ready for a while and it was an oversight not to pass them on.

The results for the regional warnings were:

Hits: 58

Misses: 38

False alarms: 464

POD = 0.60

FAR = 0.89

The results for the cell-based warnings were:

Hits: 10

Misses: 11

False alarms: 34

POD = 0.48

FAR = 0.77

Thanks,

[REDACTED]

[REDACTED]
Manager
NSW Severe Weather Section
Bureau of Meteorology
Tel: [REDACTED]
Mob: [REDACTED]

From: [REDACTED]
Sent: Thursday, 5 August 2010 1:03 PM
To: [REDACTED]
Subject: TS stats for annual report [SEC=UNCLASSIFIED]

[REDACTED],

Well picked up! The actual stats look poor but not as bad as what was in there. The correct values are:

POD: 0.48

FAR: 0.77

(These will also need to be changed in the table that is used to create a chart of historical performance).

Thanks,

[REDACTED]

From: [REDACTED]
Sent: Thursday, 5 August 2010 12:58 PM
To: [REDACTED]
Subject: Metro Severe TS Stats [SEC=UNCLASSIFIED]

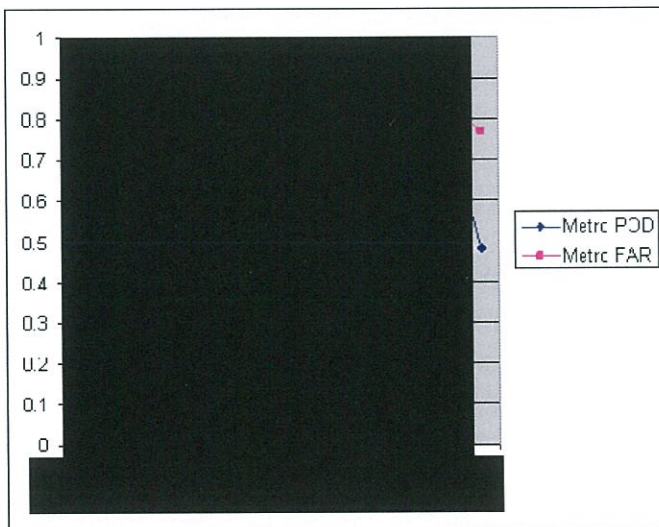
[REDACTED],

The verification for the past Severe TS season has been passed on for the annual report. The stats for Metro warnings were:

POD: 0.48

FAR: 0.77

The below chart puts this in context with past seasons.



The POD is the lowest/worst that we have yet recorded for the warning service. [REDACTED]

As always there is more to the story than this simple number. Leading into last season a conscious decision was made to try and limit the amount of marginal Detailed Metro warnings that were issued in order to create a warning service that has a higher impact when the really big storms hit. (You may remember the discussions).

As a direct result it would be expected that the number of misses could rise and the POD would fall, as has happened. (It is a shame that the FAR did not fall further to reinforce this concept).

The safety net for this philosophy was to try and ensure that if an event was marginal a regional warning would be issued to cover the situation.

[REDACTED]

[REDACTED]

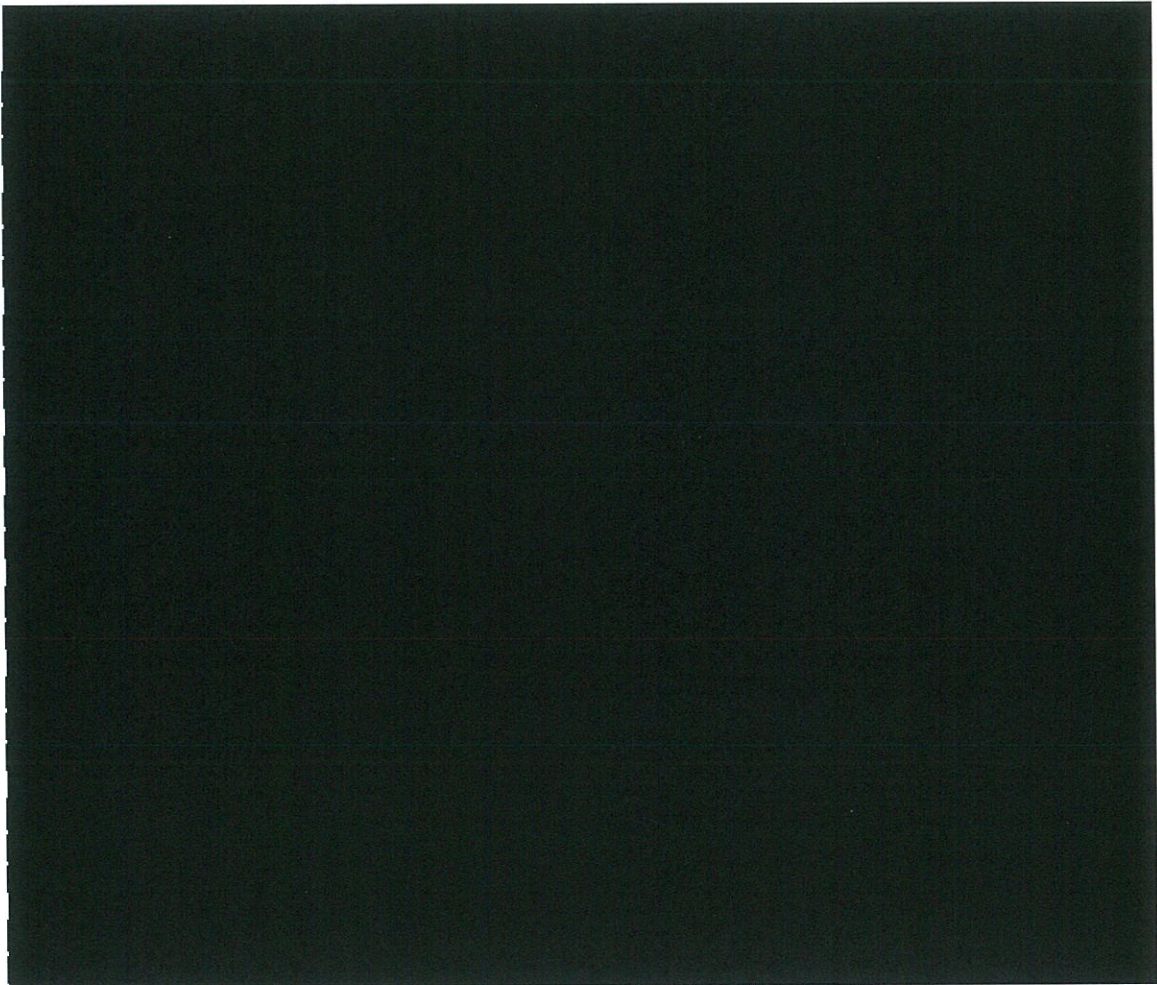
Thanks,

[REDACTED]

From: [REDACTED]
Sent: Friday, 18 June 2010 4:26 PM
To: [REDACTED]
Subject: Storm season verification [SEC=UNCLASSIFIED]

Hi all.

I have run through the stats and obtained figures for the performance of the STS warning service this past season.



The results for the regional warnings were:

Hits: 58

Misses: 38

False alarms: 464

POD = 0.60

FAR = 0.89

The results for the cell-based warnings were:

Hits: 10

Misses: 11

False alarms: 34

POD = 0.48

FAR = 0.77

It is possible these may change slightly before the final report, e.g. if I find errors have been made in the verification process while looking at the spreadsheet of stats again, or if someone else has a look to check and finds errors. As it does every other year, the "multiple district effect" has multiplied the false alarms - e.g. a warning for 8 districts with subsequent severe weather reports in 2 districts is 2 hits and 6 false alarms.

Regards,

A small black rectangular redaction box covering the signature of the sender.

From: [REDACTED]
Sent: Friday, 29 June 2012 5:07 PM
To: [REDACTED]
Subject: RE: STS stats - nearly there [SEC=UNCLASSIFIED]

Thanks [REDACTED]

It's no easy task...every year we say there must be a better way...I wish there was.

[REDACTED]

From: [REDACTED]
Sent: Friday, 29 June 2012 4:39 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: STS stats - nearly there [SEC=UNCLASSIFIED]

Hi Mick (cc Rob though you may not care considering your immediate future!),

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] To show that I actually have been able to get somewhere, I have a preliminary POD of 0.74 and FAR of 0.90 for regional warnings, verifying in the usual way by warning sequence and by district. However these numbers might improve slightly with closer examination of individual cases ("Did that rainfall really exceed the severe criteria?" etc). I haven't been able to do the cell-based stats yet, but this should be < another 1 working day - so hopefully early next week.

Hope you've had a great time over there, see you Monday or thereabouts.

Cheers,

[REDACTED]