SUBMISSION NO. 147

Phone (068) 59 3534
Fax (068) 59 3546

'Radley'
Forbes NSW 2871

16 - 4 - 2003

A.F.F.A Standing Committee
Future Water Supplies • sustainability
c/- Parliament House A.C.T.

Dear Chairman,

I wish to bring to the attention of the committee the following facts. I am a modest sized irrigation farmer and I am heavily impacted by N.S.W. water reform, the M.D.B.C. Cap(A.F.F.A.) and National Competition Policy(N.C.P.) A.F.F.A. seem to be reluctant to support research work costing real $'s and delivering real results.

The hydrology done by the M.D.B.C. is deliberately selective, a disgrace, and can only be described as "feel good" with NO economics or compensation.

The Hydrology Model I.Q.Q.M., developed by D.L.W.C.(N.S.W.) (costing many $M's and recently sold to M.D.B.C. is a lemon and should be scrapped. Too much public money has been sunk into this deficient, incompetent model. The "Cherry Picking" of N.C.P. by the N.S.W. Govt and the failure of Canberra to withhold Tranch Payments for non delivery of property rights is classic bureaucratic malaise.

The declining importance of agriculture to the economy is all too obvious. The N.S.W. Govt demand full cost recovery.

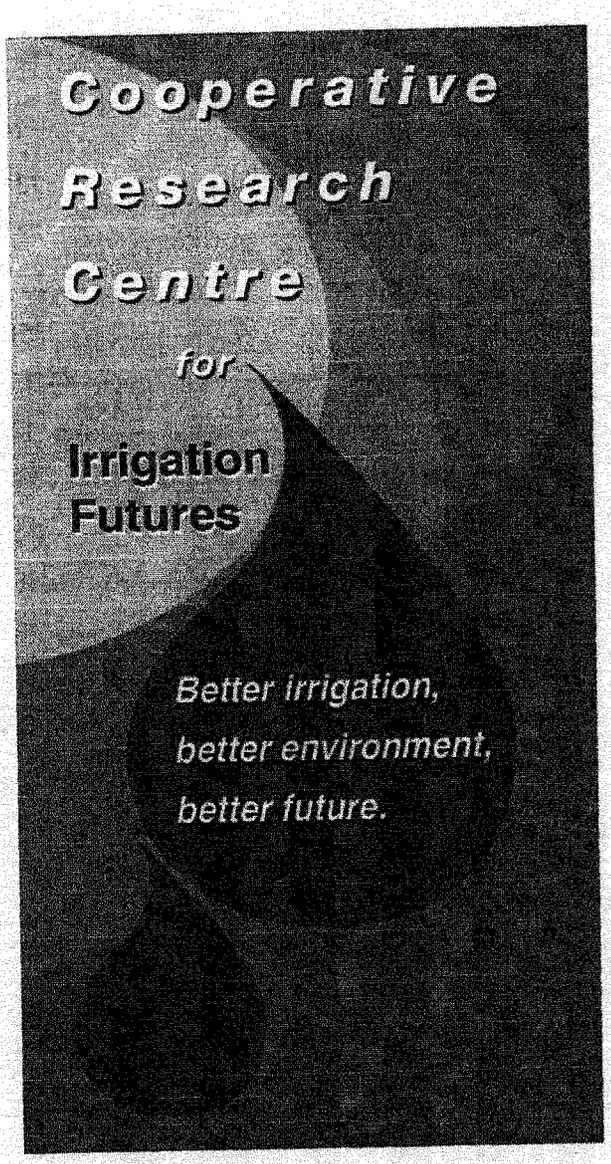
I am interested in real research work and ask you to recommend an injection of $2M/yr by A.F.F.A. into C.R.C. for Irrigation Futures. New work could then be commissioned. The present system doesn't work. The cost of the Water Audit ($80M), produced some pretty pictures but in my opinion experienced cost shifting, produced no new ideas and was a waste of tax payers money.

Phone (068) 59 3534
Fax (068) 59 3546

'Radley'
Forbes NSW 2871

I enclose a research proposal which is being considered by the CSIRO because it would be useful to farmers. Since the DLWC has been politicized, I expect DLWC refusal. I would be grateful if you would post me a copy of your report.

yours faithfully
R Caldwell
Robert Caldwell.



Application Form and Business Plan

COMMERCIAL-IN-CONFIDENCE

National Centre of Engineering in Agriculture, University of Southern Queensland

CSIRO Land & Water

Victorian Department of Natural Resources and Environment

Natural Resources and Mines Queensland

School of International Business, University of South Australia

NSW Agriculture

School of Environment and Agriculture, University of Western Sydney

School of Agriculture, Charles Sturt University

Department of Civil and Environmental Engineering, University of Melbourne

Part A CRC Application Form

Part A Section 1 Contact details and resources and activities summary

Please refer to *Notes on the Completion of the Application Form* for detailed instructions and explanations that will help you to complete this form.

1.1 Title

In less than 10 words, which must include the words Cooperative Research Centre, please record the title of the CRC.

Cooperative Research Centre for Irrigation Futures

1.2 Aim and principal objectives

In less than 100 words, please briefly describe the overall objectives of the CRC.

Double profitability, halve water use and define sustainable irrigation areas and practices.

The CRC will address the needs of stakeholders by delivering the science to secure the following outcomes:

- Irrigation enterprises, services and communities that can adapt to changing markets, technologies and environmental demands
- Urban, industrial and rural communities sharing and re using water
- Enhanced analytical capacity, knowledge and technology
- More profitable irrigation enterprises and services that improve environmental outcomes
- Improved efficiency of irrigation enterprises and services

The CRC for Irrigation Futures will promote Better Irrigation, Better Environment, Better Future

1.3 Contact officer

Please provide details of the person to be contacted during the selection process.

Name: Dr Wayne S. Meyer
Position: Program Leader, CSIRO Land and Water
Phone: 08 8303 8683
Fax: 08 8303 8509
e-mail: wayne.meyer@csiro.au
Preferred location for interview: Canberra

postal address: CSIRO Land and Water
PMB 2 Glen Osmond
SA 5064
street address for courier delivery:
CSIRO Land and Water
Adelaide Laboratory
Waite Road (entrance 4),
Urrbrae, SA

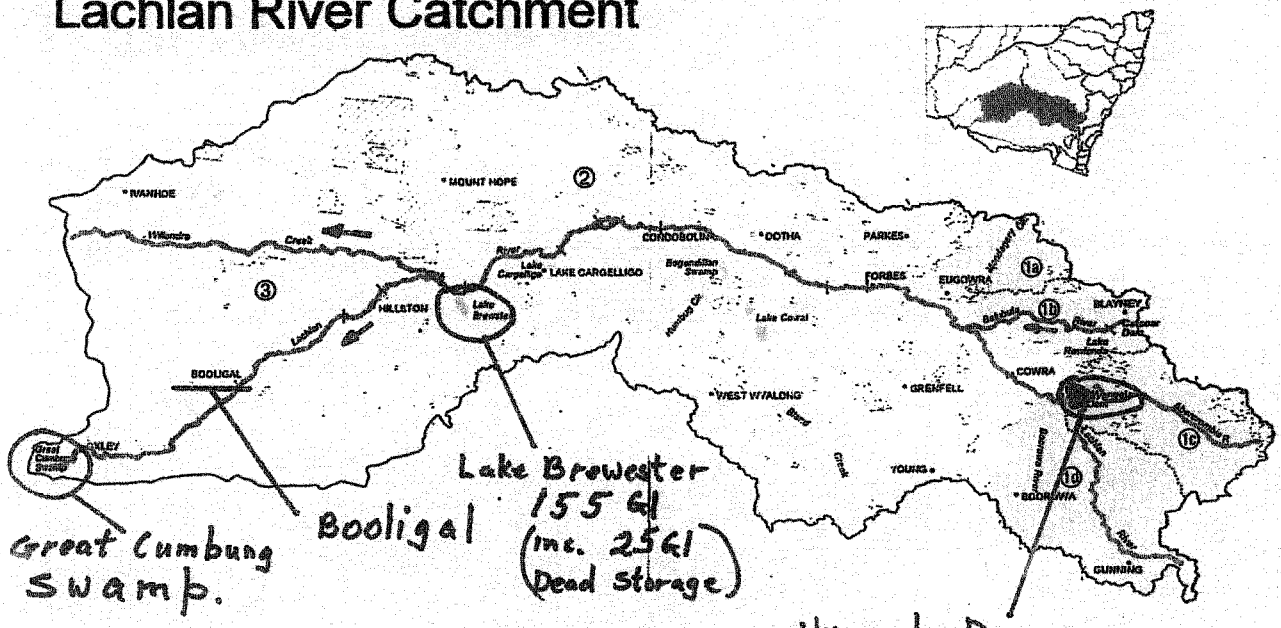
1.4 Nominated category (✔)

Please tick the category of application - refer to note 4 in Appendix 1 of the notes or section 3.4 - 3.6 of the guidelines for a full description of the various categories.

new application	☑
new application from existing CRC	☐
supplementary funding application for existing CRC	☐

Research Proposal. A ten minute presentation to Dialogue on water & climate. (6 Sept 2002) given by Robert Caldwell (Irrigationfarmer)

Lachlan River Catchment



How much water will I be allocated and how many acres will I plant ?

There is a direct trade off between irrigation and environmental flows. I hope an economist will calculate the opportunity cost of environmental flows.

Water reforms have thrown up a lot of uncertainty and I want to know my chance of getting an allocation, and the amount of financial risk I can afford to take?

Will next years profits recoupe losses from a failed or zero allocation?

The Lachlan has 1.2 mill Ml in the east, Dam high transmission losses. A shallow storage in the lower Lachlan, and a wet land swamp at the end.

LACHLAN RIVER SURFACE WATER ALLOCATIONS
1995/6 TO 1997/8
DRY CONDITIONS

	Revised 29 June, 1995		1	1	1
	RESOURCES	Notes	1995/6	1996/7	1997/8
			GI	GI	GI
*	Wyangala storage Full (1,220 GI)	1	470	175	5
	Lake Cargelligo storage Full (32 GI)	1	35	25	17
	Lake Brewster storage Full (155 GI)	1	61	5	0
*	Minimum storage inflow	2	45	74	74
	Minimum useful tributary inflow (75%)	3	25	37	37
	Current recession	4	7	0	0
	Current surplus in river	5	12	0	0
	Less: Storage evaporation	6	84	40	20
	Dead storage	7	43	25	20
*	TOTAL RESOURCES AVAILABLE		528	251	93
	HIGH PRIORITY REQUIREMENTS				
	Town Water Supply, Industrial	8	15	11	11
	High Security Irrigation	9	22	15	15
	Domestic and Stock	10	14	10	10
	Contingency Allowance	11	30	30	30
	Effluent Creeks	12	27	27	27
	Ops and Transmissions losses	13	175	100	100
	End of System flow	14	25	8	8
	Carry over reserve (for following year)	15	201	201	201
*	TOTAL HIGH PRIORITY REQUIREMENTS		509	402	402
	ALLOCATABLE RESOURCES:				
	Water available for allocation	16	19	-151	-309
	100% General Security Entitlement	17	596	596	596
	Utilisation Factor	18	1.00	1.00	1.00
	Calculated G.S. Allocation (%)	19	3	-23	-46
	Contingency Allowance (General Security)	20	2	-16	-32
	PROBABLE ANNOUNCED ALLOCATION				
*	General Security	21	0	0	0
	High Security	21	70	70	50

* Key Features.

This spread sheet explains how the resources are allocated.

The Resources are assessed (water on hand) add to this min inflows for 24 months. This gives resources available.

High priority and environmental flows get first priority.

In this case, there is not much left over and general security get "0". The allocation this year is 3%.

The high priority requirements are 509 Gl, in this example. Environmental flows have probably increased this to 600 Gl or 700 Gl. The median inflow is 586 Gl.

There are two interesting features:

a. min inflows are the worst inflow in 100 years and set the risk of failure at 1 in 100 years.
b. Transmission losses are high. Delivery losses are 10% to the upper Lachlan and 75% to the lower Lachlan. This rapidly depreciating resource requires different thinking to a pipe system with no losses.

COAG Cap

I am not sure COAG knows what the environment requires.

Review of Cap Implementation 1996/97

Report of the Independent Audit Group

CONCLUSIONS/RECOMMENDATIONS

- NSW is committed to full implementation of the Cap.
- The pursuit of river flow objectives to achieve environmental outcomes will ensure diversions below the Cap.
- Climate adjusted Caps have been established for a number of valleys and will be replaced by models for all valleys.

The Great Cumbung Swamp used to dry out 25% of the time. It is now wet all the time.

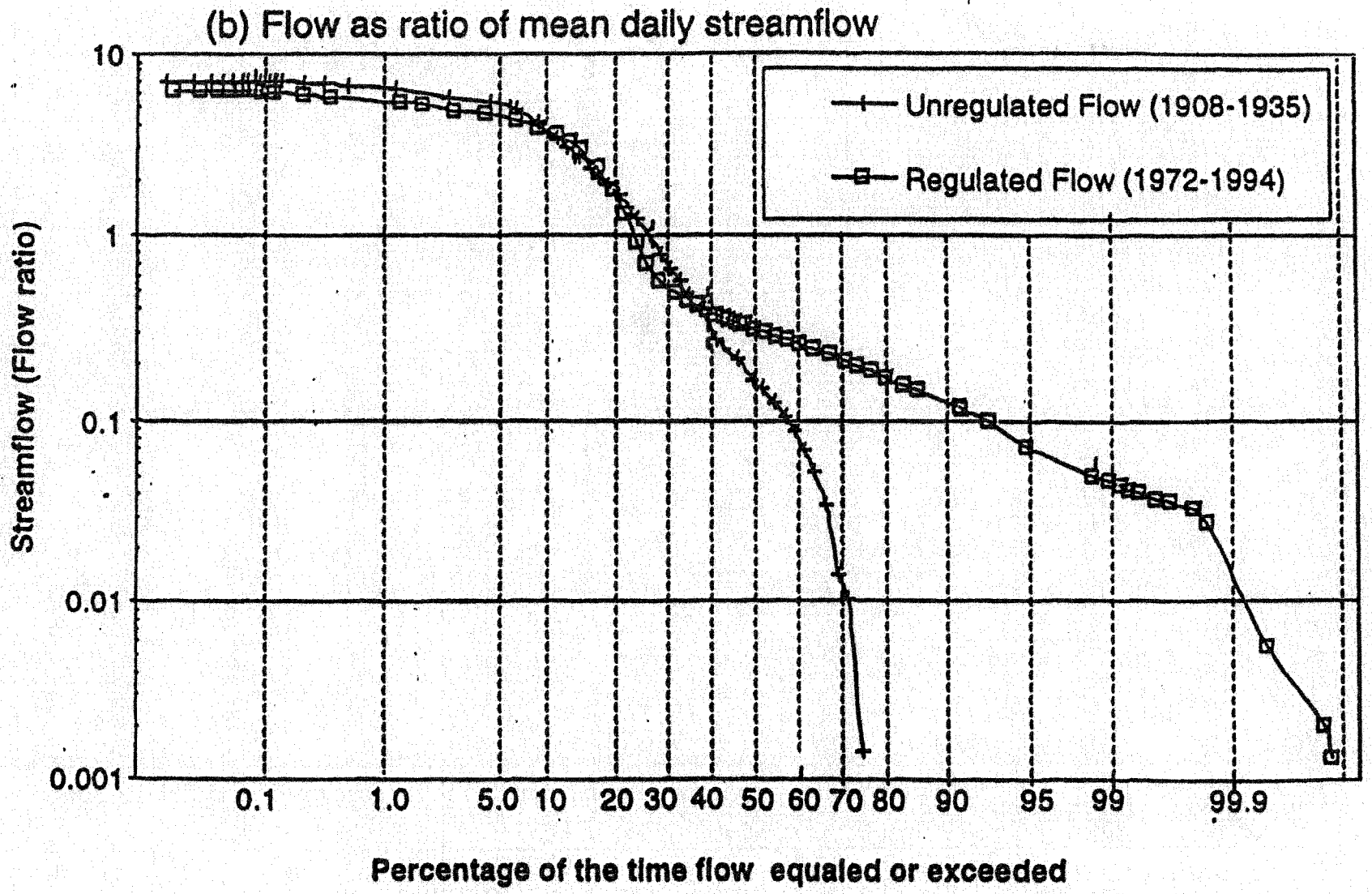
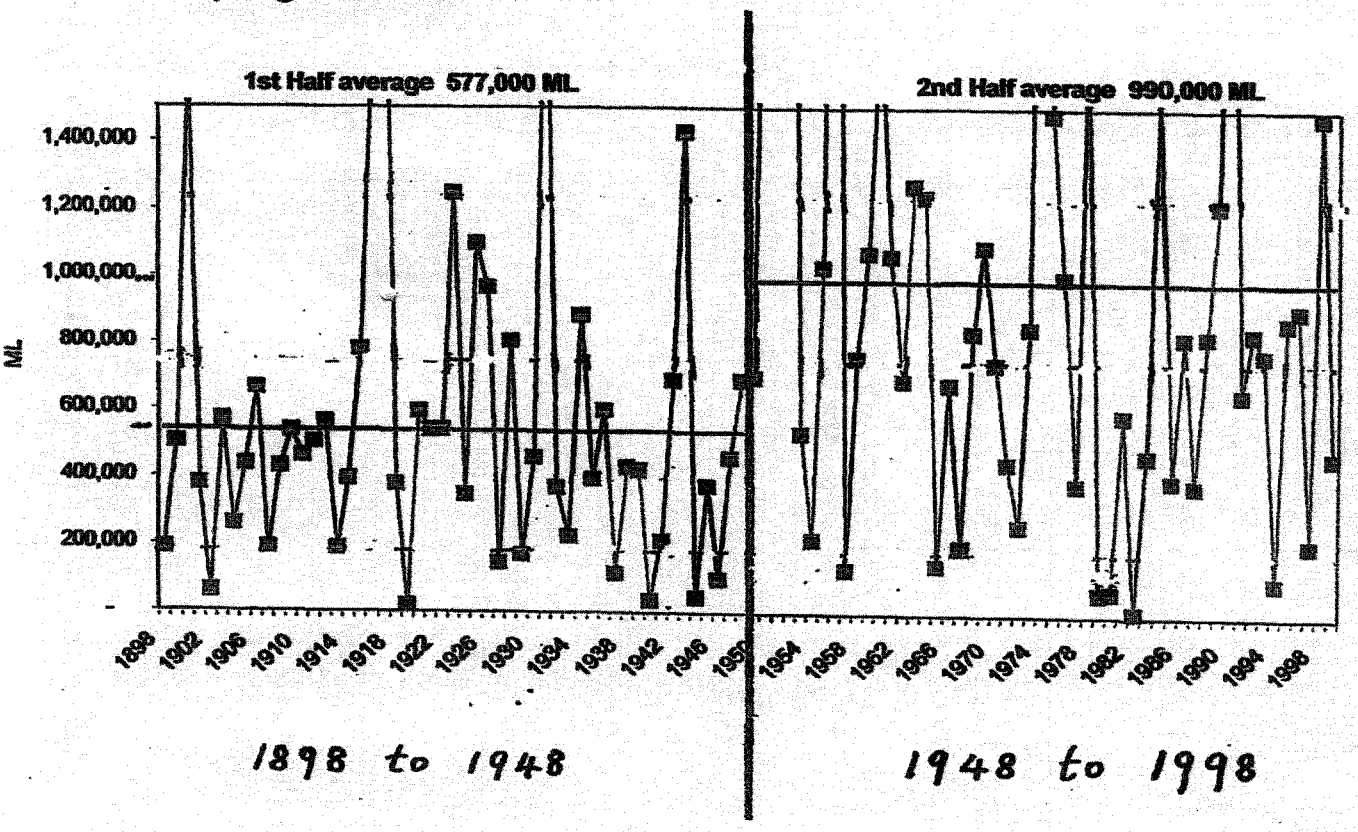


Figure A2.2: Daily flow duration Curve for Lachlan River at Booligal

In our recent past, inflows were 60% of present value.

A mean inflow of 577 Gl is less than high priority requirements.

Climate Variability.



In flow exceedence are generated from a history of inflows.

95% exceedence equates to 1 in 20 years of failure.

Inflows to Wyangala Dam

FLOW DURATION ANALYSIS, UNITS - GIGALITRES

FOR PERIODS COMMENCING IN JULY

	INDICATED VALUE					
	50 %	60 %	70 %	80 %	90 %	95 %
JULY	39.6	26.8	16.7	8.7	5.6	3.9
AUG	136.4	93.5	61.4	27.6	17.8	8.4
SEPT	220.5	159.9	112.0	53.1	28.8	14.2
OCT	303.2	207.1	150.2	74.1	38.1	18.1
NOV	315.0	247.8	165.1	89.3	48.0	19.9
DEC	348.6	270.7	176.8	98.5	55.8	29.5
JAN	378.5	293.4	176.5	115.3	69.1	36.6
FEB	378.6	299.2	201.6	132.3	83.0	37.5
MAR	379.3	307.3	202.4	140.4	94.2	56.6
APR	395.0	317.3	215.6	141.2	95.2	63.1
MAY	466.6	343.8	218.3	141.9	98.7	74.7
JUNE	526.4	388.7	223.5	187.7	132.1	95.7

GI

→1 yr

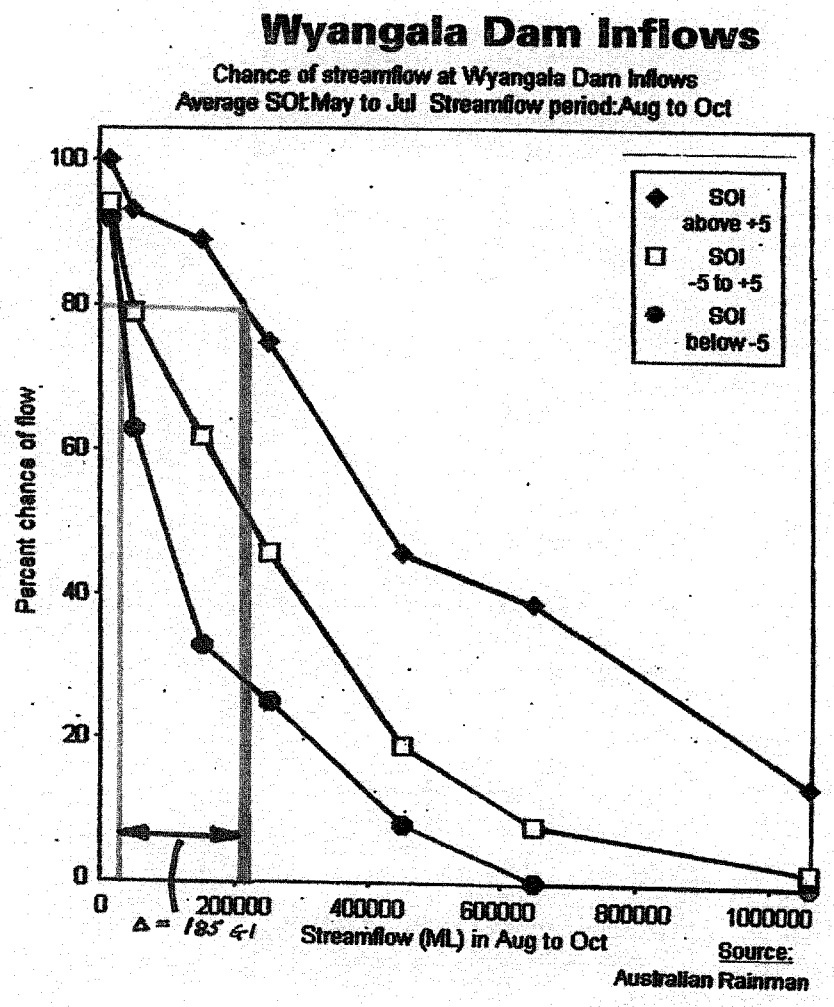
Median Inflow

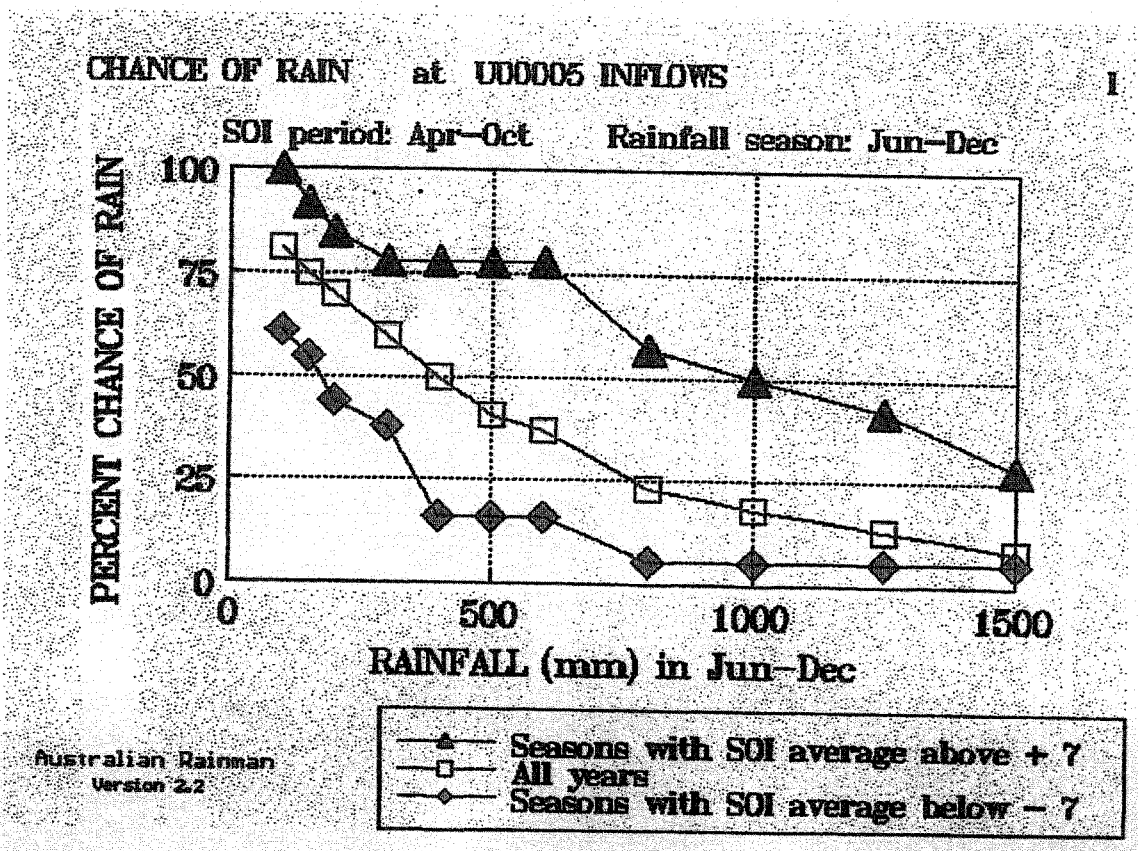
1/5

1/10

1/20

In flows can be biased by S.O.I. without increasing the risk of failure.





Most of the inflows come in Spring.

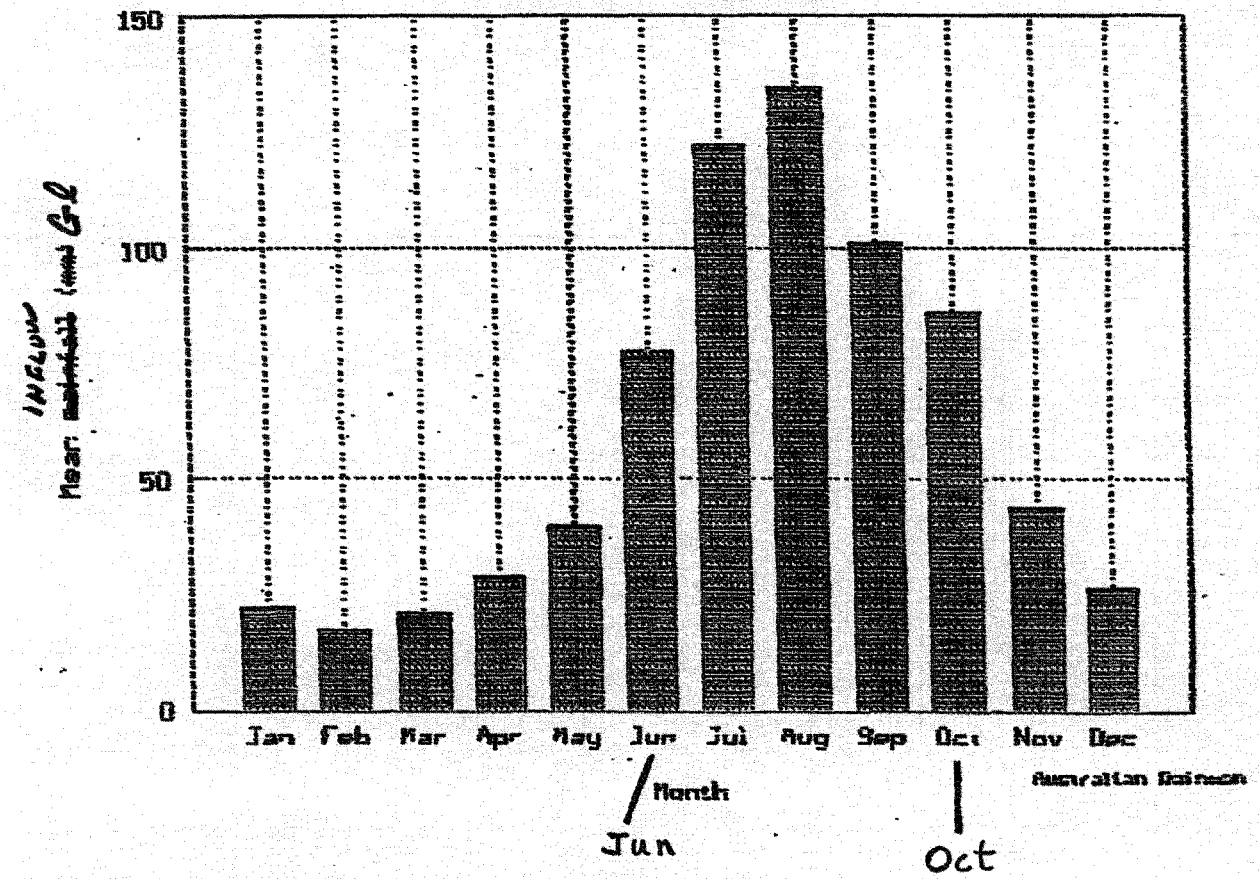
U00005 INFLOWS TO WYANGLA IN GL lat. long. elev.

Statistical summary :-

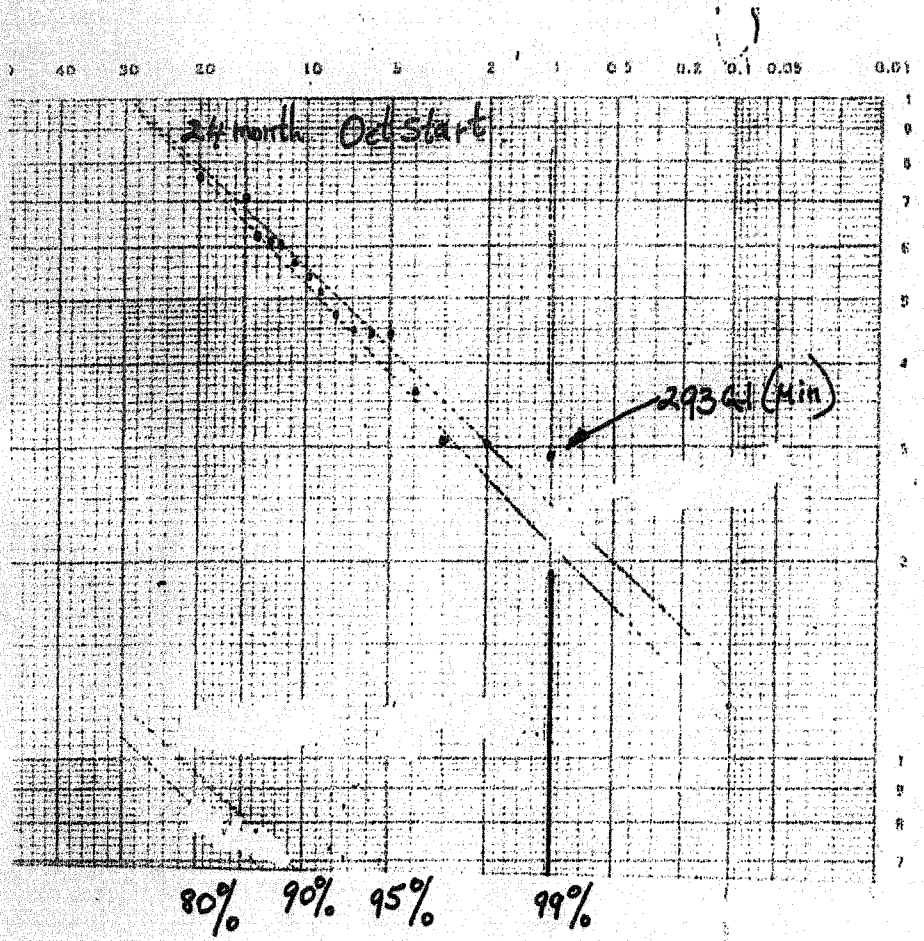
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	T
Mean	22	17	21	29	40	77	122	134	101	86	44	27	
Median	8	7	6	6	7	20	40	88	60	32	18	13	
Std. dev.	40	28	53	73	96	162	170	158	110	129	63	43	
Lowest rain	0	0	0	0	0	0	0	0	0	1	0	0	
Highest rain	211	157	390	396	545	1169	815	932	537	680	391	243	
Mean raindays	999	999	999	999	999	999	999	999	999	999	999	999	
No. of years	100	100	100	100	100	100	100	100	100	100	100	100	

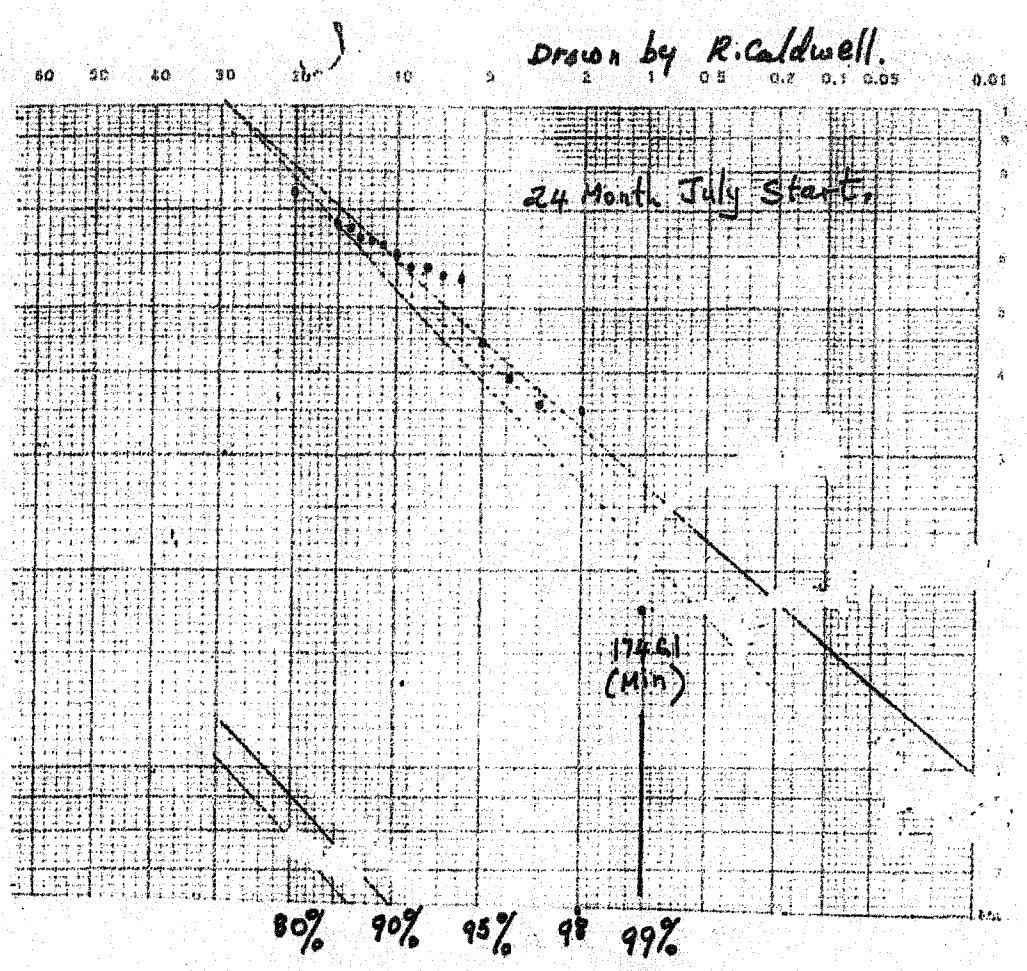
INFLOWS
~~Rainfall~~ recorded at U00005 INFLOWS 1

Monthly inflow ~~rainfall~~



The allocation can be improved by moving the water year from a July start to an October start. 119 GI (= 40% allocation) is available with no additional risk. (typical spring inflow).





Oct Start 293 GI

July start 174 GI.

An increase of 119 GI Available Same Risk (1 in 100 yrs)

The University of Melbourne did a study from 1997 - 1999, Moving the water year and using S.O.I. have been ignored.

WATER ALLOCATION STRATEGIES FOR THE LACHLAN RIVER VALLEY

K. Panta, T.A. McMahon, H.N. Turral, H.M. Malano, W. Malcolm and C. Lightfoot

THE UNIVERSITY OF MELBOURNE Australia

POSTERA CRESCAM LAUDE

November 1999

Centre for Environmental Applied Hydrology

Engineering Hydrology Aquatic Ecology
Hydraulics Fluvial Geomorphology Biogeography

Department of Civil and Environmental Engineering
The University of Melbourne Parkville Victoria 3052 Australia

16. RECOMMENDATIONS

There are a number of recommendations that follow from this study which are set out below:

- The New Hydrology corrects the anomalies and the inconsistencies associated with the records of old inflows to Wyangala Dam (specifically the extreme drought period in the early part of this century). Hence it is recommended that the New Hydrology be used for resource assessment and planning of the system.[13]
- There is a small advantage to the irrigators of moving to a September water year. September water year tends to give higher allocation and divertible water during marginal to dry years of operation. It is suggested that this be adopted for a trial period of 3 years after which a full review is undertaken. DLWC should undertake further analysis using the latest version of IQQM for the Lachlan.

Move water year

- It appears that general security carry-over of 20% of total entitlement will have a significant effect on all users. More detailed analysis of such a change needs to be carried out, again using the most recent version of IQQM.
- An ENSO forecast on inflow to Wyangala reservoir should be implemented by DLWC. If DLWC is not prepared to make allocation announcements based on this, DLWC should announce the likelihood of final allocations with associated risks based on ENSO.
- The DLWC should routinely provide ENSO forecasts to farmers to enable them to make a better risk assessment on planting based on allocation announcements.

ENSO

- Some changes need to be incorporated into IQQM[14] namely:
  - a more realistic evaporation routine (use of actual evaporation data)
  - general security carry-over
  - adjustment of summer and winter crops according to the availability of water
- Detailed studies of how the MDBC Cap will be implemented in the Lachlan Valley are required and should be followed by further analyses of the impacts of the Cap on irrigated agriculture.
- The present study of the impact of water allocation strategies on the Valley economy dealt with regionalised values. It is recommended that a more detailed study be carried out that deals with the impact of operating strategies for a range of farm sizes in various parts of the Valley.
- It is suggested that farmers develop farm plans and budgets to plan optimum cropping based on the allocation announcement and the level of risk they are prepared to take. They should consider contingency plans to respond to water restriction policies when inflows are less than those predicted using ENSO or other probability estimates.

I hope the CSIRO can write software which can generate exceedence charts like this for allocation. Inputs would be:

In puts:- Levelin Dam, S.O.I., outlook, water sharing rules, month of year.
Out puts:-% allocation and risk of failure.

Exceedence Chart for Allocations.

FOR PERIODS COMMENCING IN JULY

INDICATED VALUE					
50 %	60 %	70 %	80 %	90 %	95 %
JULY					
AUG					
SEPT —					
OCT —					
NOV —					
DEC —	(...)	(....)	(..)		
JAN —					
FEB —	(...)	(...)	(...)		
MAR —					
APR —	(...)	(....)	(....)		
MAY —					
JUNE —					

% Allocation

Risk of Failure → 1/5 1/10 1/20

dialogue on water and climate

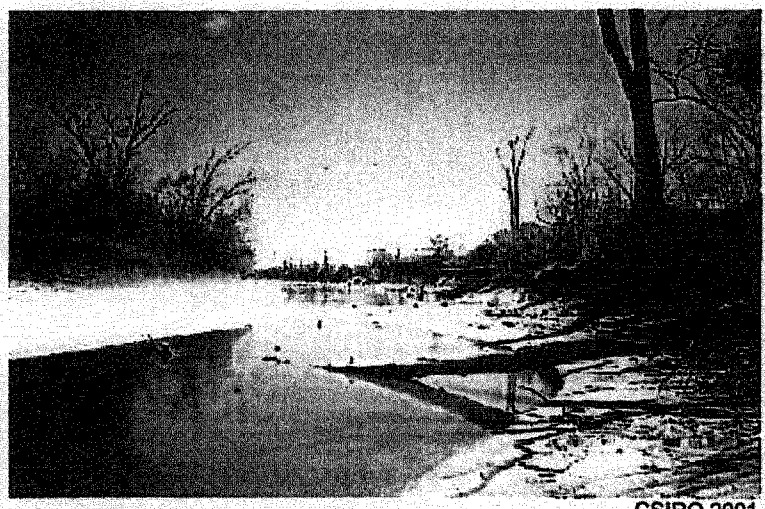
for the Murray-Darling Basin

6 September 2002

Brisbane Convention and Exhibition Centre, Plaza Level, Room P3

Climate change and climate variability are key issues in water management. Climate-based simulations for the Murray-Darling Basin are beginning to show consistent patterns of change in water availability.

Irrigation, environmental flows and other water allocations face increasing risk from droughts and other climatic extremes. Recent water reforms and new environmental flow rules have also had major impacts on water availability.



CSIRO 2001

The MDB Dialogue on Water and Climate will feature presentations from:

- UNESCO HELP
- CSIRO
- Murray-Darling Basin Commission
- Queensland Centre for Climate Applications
- Victoria University
- and a wide range of stakeholders, from irrigation farming, irrigation industry and other water-dependent sectors.

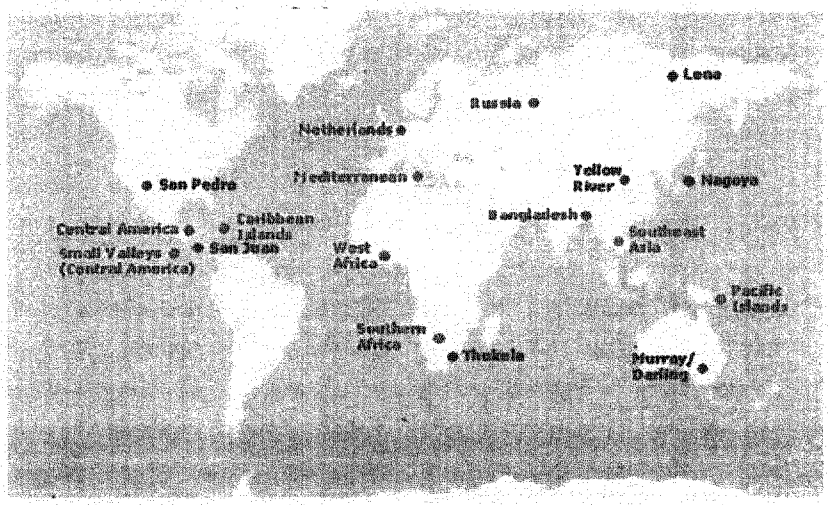
The afternoon session will be held as panel discussion with experts and stakeholders. Your inputs and questions are important.

What is the Dialogue on Water and Climate ?

The evidence is undeniable: there has been an overall increase in the frequency and magnitude of extreme climatic events over the past decades. A number of hotspot regions are going to see drastic declines in water availability caused by climate change.

The Dialogue on Water and Climate (DWC) provides a platform that bridges the information gaps between the water and climate sectors in order to improve water management under climate variability and change.

The DWC has established a series of basin, national and regional dialogues around the world.



Contact info: International Secretariat of the Dialogue on Water and Climate

General Management Office
PO Box 3015
2601 DA Delft
The Netherlands
T +31 15 215 18 82
F +31 15 212 16 76
E hvs@ihe.org
I www.waterandclimate.org

Science Support Office
PO Box 47
6700 AA Wageningen
The Netherlands
T +31 317 47 43 14
F +31 317 41 90 00
E p.kabat@alterra.wag-ur.nl
I www.waterandclimate.org

dialogue on water and climate

WMO UNEP

IUCN The World Conservation Union

Global Water Partnership

IWA International Water Association