



NSW DEPARTMENT OF  
**PRIMARY INDUSTRIES**

## NSW DPI Biometrics Unit: Traineeships for statistics students in 2008

Presented by Alison Smith & Elizabeth Mudford

# NSW Department of Primary Industries

## Overview

- Staff of 3700 at over 130 locations across NSW
- Delivers wide range of services to primary industries (agriculture, fisheries, forestry and mining)
- Important role is conduct of scientific research to enhance growth and sustainability of primary industries in NSW

# NSW DPI Biometrics Unit

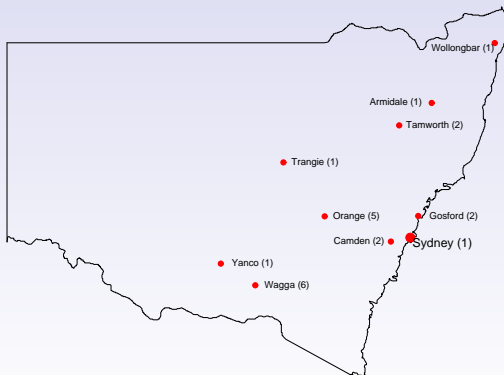
## What do we do?

- Role is to underpin the research portfolio of NSW DPI with the provision of high quality advice to ensure validity and efficiency for the research effort and expenditure
- Provides a statistical consulting and training service to research staff of NSW DPI
- Undertakes applied statistical research motivated by problems of relevance to NSW DPI or arising from collaborative projects from NSW DPI staff and industry
- Important training role in the provision of both basic and specialised courses in statistics, research methodology and the use of statistical packages

# NSW DPI Biometrics Unit

## Who works for us?

- Currently 22 biometricians located at research centres around NSW: usually more than one at a location
- Unit led by Prof. Brian Cullis located at Wagga Wagga Agricultural Institute



# NSW DPI Biometrics Unit

Who works for us?

- Qualifications:
  - on entry: for majority was degree majoring in mathematical statistics
  - currently: over half have Masters or PhD

# NSW DPI Biometrics Unit

Why work for us?

1. Diversity
2. Professional freedom
3. Team membership
4. Working conditions
5. Career path
6. Job satisfaction

# NSW DPI Biometrics Unit

Why work for us? Diversity

- Wide range of scientific applications
- Wide range of statistical methods used

# NSW DPI Biometrics Unit

- Some example projects:
  - Plant breeding and evaluation: field and lab trials to choose best varieties for range of traits and environments. Experiment design; Linear mixed models: spatial for individual trials; GxE models across trials ('meta-analysis')
  - Forestry: biomass in commercial logs and stumps (affects carbon storage). Model as function of covariates (species, location, DBH). Linear mixed model: splines for non-linear regression
  - Modelling proportion of water flow down a stream from different sources: ground water, near surface water, rain. Bayesian methods (MCMC). Estimate salinity levels



# NSW DPI Biometrics Unit

- Some example projects:
  - Controlled atmosphere experiments for cherry storage. Visual assessment at periodic intervals; taste testing. Experiment design; Binomial (logistic) regression; Linear Mixed Models
  - Mark recapture aerial surveys to monitor wildlife and feral populations. Detection probability models
  - Macadamia physiology; mango production; silver perch breeding. Generalised Linear Models; survival analysis



# NSW DPI Biometrics Unit

- Some example projects:
  - High quality green tea for export (Japan): varietal selection, propagation, nutrition, bush management and processing techniques. Experiment design; Linear Mixed Models
  - Impact of increasing flow of Snowy River on fish species diversity and abundance. 14 sites repeatedly measured over 6 years (3 years before/after flow altered). 'Electro-fish' to count and measure fish. Generalised Linear Mixed Models
  - Genetic markers for bacteria causing diarrhoea in pigs. Cluster analysis; Principal Coordinate Analysis



Alison Smith & Elizabeth Mudford



NSW DPI Biometrics Unit Traineeships 2008

# NSW DPI Biometrics Unit

## Why work for us? Freedom

- Develop your own client base. Not told which projects to work on nor how to do it.
- Work autonomously but as part of team
- Externally funded projects encouraged (but not mandatory!). Includes overseas projects (thence travel)
- Statistical research encouraged
- Professional development encouraged (national and international conferences etc.)
- Further study encouraged (and supported financially)

# NSW DPI Biometrics Unit

Why work for us? Team membership

- Work within experienced and knowledgeable team of biometricians
- Mentoring of new recruits

# NSW DPI Biometrics Unit

Why work for us? Work conditions

- Flexibility in working hours. Leave entitlements
- Pleasant work environments; own office

# NSW DPI Biometrics Unit

## Why work for us? Career path

- Most biometricians on Professional Officer scale: main role is statistical consulting leading to collaborative scientific papers.
- Formal and well documented procedures for progression: internal review.

Grade	salary range \$K	current biometricians
1	46 - 62	0
2	65 - 72	9
3	75 - 81	8
4	84 - 89	1

# NSW DPI Biometrics Unit

## Why work for us? Career path

- A few on Research Scientist classification: rewarded for scientific merit.
- Statistical research, student supervision and external projects are important.
- Entry and progression/maintenance in classification by external review.

Class	salary range \$K	current biometricians
RS	68-89	1
SRS	91-103	1
PRS	106-?	1
SPRS	? - ?	1

# NSW DPI Biometrics Unit

Why work for us? Job satisfaction

- Impact of your work on primary industries (both in NSW and broader area)
- Held in high regard by scientists. Valued as collaborator rather than technical assistant or 'number cruncher'

# NSW DPI Biometrics Unit: 2008 Student Traineeships

## Undergraduate

- Up to 4 traineeships for study in 2008
- Must be studying, or intending to study 200 or 300 level statistics courses
- Stipend is \$6,000 for one year
- Must be willing to participate in vacation employment scheme: minimum 6 weeks; maximum 12 weeks during vacations (salary rate of \$33,000pa or equivalent)
- Successful applicants expected to complete majority of vacation employment before start of 2008 academic year

# NSW DPI Biometrics Unit: 2008 Student Traineeships

## Honours

- Up to 2 traineeships for students intending to undertake honours program in applied statistics in 2008
- Must be currently studying 300 level statistics courses
- Stipend is \$12,000 for one year
- Must be willing to participate in vacation employment scheme: minimum 6 weeks; maximum 12 weeks during vacations (salary rate of \$45,000 or equivalent)
- Successful applicants expected to complete majority of vacation employment before start of 2008 academic year
- Must also undertake research project co-supervised by NSW DPI senior biometrician

# NSW DPI Biometrics Unit: 2008 Student Traineeships

## Further information

- Contact Brian Cullis
  - email: [brian.cullis@dpi.nsw.gov.au](mailto:brian.cullis@dpi.nsw.gov.au)
  - mobile: 0439 448 591
- Download applications from:  
<http://www.austatgen.org/files/Traineeships>
- Applications close: 30/11/07



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