



## Faculty of Computing Health and Science

### Research Group, Research Centre or Research Institute Report

**RESEARCH UNIT NAME:** Natural Resources Modelling and Simulation Group

**RESEARCH UNIT LEVEL (tick):**

Level I Research Group:

Level II Research Centre:

Level III Research Institute:

Centre of Excellence:

**REPORT TYPE: ANNUAL REPORT**

**YEAR: 2008**

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**BRIEF OVERVIEW** (1 – 2 paragraphs):

The focus of the research group is on the modelling of data from a variety of backgrounds, including but not restricted to natural resources. Current projects include the spatio-temporal modelling of prawn and scallop catch rates, cancer incidence and mortality in WA, HIV/AIDS in Ghana and the modelling of mining data. The mathematical techniques employed cover geostatistics and time series analysis.

**MEMBERSHIP** (Full Title of Researchers, including staff, research students, adjuncts):

Associate Professor Ute Mueller

Associate Professor Jim Cross

Mrs Changying Shao

Mr Patrick Aboagye-Sarfo

Ms Ainslie Denham

Mr Philip Savory

Mr Robin Dunn

Mr Yuichi Yano

**NEW GRANTS** (Identify Funding Body, Value of grant, Years Funded, Chief Investigator, collaborators, title):

Nil

**PUBLICATIONS, REFEREED BOOKS, CHAPTERS, JOURNAL ARTICLES, CONFERENCE PAPERS, REPORTS:**

1. Bandarian, E.M. and Mueller, U. (2008) Reformulation of MAF as a generalised eigenvalue problem, Geostats2008, December 2008
2. Denham, A.M. and Mueller, U. (2008), Space-time geostatistical analysis of King Prawn catch rate, Geostats2008, December 2008
3. Mueller, U., Dickson, J., Kangas, M. and Caputi, N. (2008) Geostatistical modelling of the scallop density distribution in Shark Bay, Western Australia from survey data, Geostats2008, December 2008
4. Bandarian, E.M., Bloom, L.M., and Mueller, U. (2008) Direct minimum / maximum autocorrelation factors for multivariate geostatistical simulation, Computers and Geosciences 34, 190-200
5. Mueller, U., Bloom, L., Kangas, M, and Caputi, N. (2008). King Prawn Catch by Grade Category from an Economic and Stock Management Perspective, in Soares, A. et al (eds), geoENV VI - Geostatistics for environmental applications, Springer, 103-116.

**HIGHER DEGREE BY RESEARCH LOAD** (List name of candidate and degree type)

Mrs Changying Shao, PhD(Mathematics)

Mr Patrick Aboagye-Sarfo, PhD(Mathematics)

Ms Ainslie Denham, PhD(Mathematics)

Mr Philip Savory, MSc (Mathematics and Planning)

Mr Robin Dunn, MSc (Mathematics and Planning)

Mr Yuichi Yano, MSc (Mathematics and Planning)

Mr Grant Collins , MSc (Mathematics and Planning)

**HIGHER DEGREE BY RESEARCH COMPLETIONS** (List name, degree, title of thesis)

Ms Ellen Bandarian, PhD, Transformation methods for multivariate geostatistical simulation

**VISITORS AND COLLABORATIONS** (List the organisation's name and short summary of the nature of the collaboration. Separate into local, national and international)

Nil

**COMMUNITY ENGAGEMENT ACTIVITIES AND LINKAGES** (Provide an overview)

Consultancy agreement with Rio Tinto Iron Ore for the provision of advice on geostatistical techniques.

**FUTURE PLANS AND DIRECTION** (Provide an overview)

Broaden the focus to mathematical modelling more generally.

Build on existing links and increase collaboration with other areas in the faculty, in particular with the School of Natural Sciences and with Sports Science.

**DATE OF NEXT FORMAL REVIEW**