

**Centre for Disaster Studies  
James Cook University to Queensland**

**Annual Report to  
Department of Emergency Services**

**Financial Year 2003/2004**

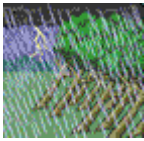


**Bushfire in Thuringowa (Townsville) North Queensland 2003**



**Mulgrave Road, Cairns after the passage of Cyclone Steve 2000**

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**[Cairns Not Prepared for Cyclones](#)** Far North Queenslanders are putting their lives at risk by underestimating the cyclone risk to our region. [>>More](#)



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**[Super Cyclones Ten Times More Frequent](#)** Research published today in Nature indicates the Great Barrier Reef may have experienced super-cyclones every two to three centuries. [>>More](#)

..The Centre for Disaster Studies is a multi disciplinary research unit presently housed in the School of Tropical Environment Studies and Geography of James Cook University. The Centre has acted as the university's face to the public and the professionals in the Emergency Management and Meteorology fields, city councils and other researchers since its establishment in 1979.



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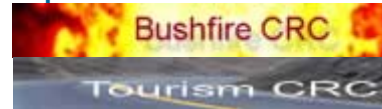
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### Cooperative Research Centres



# **Annual Report of the Centre for Disaster Studies of James Cook University to Queensland Department of Emergency Services for Financial Year 2003/2004**

The Centre for Disaster Studies has continued to implement significant changes in its structure and organisation during 2003 and 2004. This report supplies more detailed accounts of the background to the centre, personnel presently involved with research projects, research projects that are ongoing are were completed during 2003/2004, communication of research findings and hazard education in general, and a list of most of our publications. At the conclusion of financial year 2003/2004 the Centre initiated a strategic Planning process that will be finalised by the conclusion of 2004.

## **Summary and Highlights of the Centre in 2003/2004**

1. Research Projects
  - 1) Bushfire CRC Communities Program
  - 2) The Post-Doctoral Bureau of Meteorology ARC Linkage Project
  - 3) Communicating the Tropical Cyclone Risk to Backpacker Tourists in Cairns
  - 4) Disseminating Weather Forecasting Information for Indigenous Communities in Australia
  - 5) Natural Hazard Vulnerability, Awareness and Mitigation Strategies for Remote and Indigenous Communities.
  - 6) Tourism and Terrorism. Bali: A Case Study in Crisis Management
  - 7) Tourism Industry Risk Management In Tropical Coastal Areas
  - 8) Tourism Risk Management for the Asia Pacific Region
  - 9) Construction of a website listing current and previous post cyclone surveys from within Australia and around the world.
2. Involvement with CRCs
  - Bushfire CRC
  - Sustainable Tourism CRC
3. Land Use Planning (Environmental & Urban Planning) & Hazards
  - Accreditation of Planning program with Planning Institute of Australia
4. Communities & Disasters Book
5. Upgrade of Centre Website  
<http://www.tesag.jcu.edu.au/CDS/index.shtml>

## **Background and Mission of the Centre**

A few years after the establishment of James Cook University, Townsville was hit by cyclone Althea in 1971. This event generated strong research interest in cyclones and natural hazards. Cyclone Tracy's destruction of Darwin in 1975 boosted that research activity which culminated in the formal establishment of the Centre for Disaster Studies in 1979. Two years earlier the Cyclone Testing Station had been established and some researchers worked with both centres. A close research relationship has continued and it is envisaged that both centres will cooperate in moving towards the formal recognition of hazard/disaster research as "an emerging area of research strength" at JCU. Emphasis during the 1970s and 1980s was on understanding, predicting and directly mitigating the hazard. Research was physical and hazard centred. At that stage the centre was funded directly by the university and existed as an independent centre reporting to the university council and structured through a management committee and an advisory committee.

By the beginning of the 1990s the centre had lost members and become moribund until James Cook University was approached by the Director General of Queensland Department of Emergency Services to re-invigorate the centre, and around 1994 was directly funded by QDES with an establishment grant and an annual grant. Professor Richard Aynsley took up the Directorship in 1994 on his move to James Cook University to establish Tropical Architecture, but he handed over the directorship to D.King in 1995. In re-activating the centre, the Director General had stressed the importance of the social impact of hazards and disasters. As D.King is a social scientist a strong program of social and community impact research was initiated in 1995, initially funded through the TCCIP, and subsequently tapping into a wide range of research project funding from BoM, EMA, QDES, AGSO/GeoScience, CCC, ARC, Bushfire and Sustainable Tourism CRCs, Queensland Health and community organisations. During 1996/97 James Cook University experienced financial crisis and underwent major restructuring. Direct funding to all minor research centres ceased, although in-kind support has continued through the provision of office space and salaries of profile staff members. The restructure also located CDS inside the School of Tropical Environment Studies and Geography, the school of its director,. Thus the Director reports directly to the Head of School, and the centre benefits from the administrative support of the school. The Board of Management was no longer required and was abolished. The re-establishment of the Advisory Committees in Townsville and Cairns continues to be a goal. However, ongoing membership of the Cairns Counter Disaster Coordinating Committee has involved the centre in a strong advisory role in the community.

When the university had funded the centre before 1995, a part time administrative officer was employed. When D.King took over, at the time that direct funding from the university ceased, the QDES grant was used to employ a research officer, whose job description included coordination of the centre's activities and operation of the centre office. Linda Anderson-Berry commenced work with the centre in 1995, further defining the role as she developed a suite of research projects. Her salary was supplemented from competitive research

grants, and subsequently a PhD scholarship and Postdoctoral Fellowship. Linda's development of research in the centre contributed to her overall career development, such that while her departure is a loss to the centre, the high level position into which she moved is a reflection of the quality of research that she achieved. From a very small base in 1995, the centre has grown into a significant research group, staffed primarily through the involvement of profile staff members and research students. Staff and students are located in equal numbers on both the Cairns and Townsville campuses, with research on hazards taking place in both cities and surrounding locations, especially throughout the north of Australia. In 2003 the centre occupied a suite of new offices at the Cairns campus, with Jordahna Haig, a student engaged in hazard research, taking over the role of coordinator when Linda resigned in March 2003. In reorganising the centre Dr Jon Nott agreed to assume the role of Deputy Director, in order to provide direct leadership in Cairns. Jon has been a member of the centre since the mid 1990's and is extensively involved in hazard research in the Cairns region and throughout northern Australia.

The only untied funding received by the centre is the annual grant made by the Department of Emergency Services. This remains crucial in enabling the centre to carry out its functions as a community resource centre and as a generator and facilitator of disaster research. Specific projects provide tied research funds, which support most of our activities. However, it is the grant from QDES that enables us to apply for funds, attend meetings and involve the wider community of researchers and the public. Half of the grant pays the coordinator's fractional salary, while the rest supports office expenses, travel to some meetings especially those that are concerned with building linkages and establishing research partnerships, and as seed money towards some of the smaller research projects.

## **Partner Institutions and Acronyms**

AEMI – Australian Emergency Management Institute, Mt Macedon

APAI – Australian Postgraduate Award with Industry

ARC – Australian Research Council

BoM – Bureau of Meteorology

CCC – Cairns City Council

CDS - Centre for Disaster Studies (indirectly funded from QDES)

CRC – Cooperative Research Centre (Sustainable Tourism CRC and Bushfire CRC)

EMA – Emergency Management Australia

Geoscience Australia (Formerly AGSO)

JCU – James Cook University

QDES – Queensland Department of Emergency Services

Queensland Health

TCCIP – Tropical Cyclone Coastal Impact Program

## **Personnel at James Cook University, Researching with the Centre for Disaster Studies during 2003/2004**

Dr David King, Director, is an Associate Professor of Human Geography in the School of Tropical Environment Studies and Geography, and is also Director of the Centre for Tropical Urban and Regional Planning. This latter centre encompasses the teaching program in planning and provides very strong links with the planning profession. As well as strong involvement in planning education, he also has extensive knowledge of the South west Pacific, especially Papua New Guinea. Dr King is a Corporate Member of the Planning Institute of Australia.

Dr Jon Nott, is Deputy Director and Reader in Physical Geography in the School of Tropical Environment Studies and Geography. His broad research interests are in Quaternary climate change and the reconstruction of prehistoric natural hazards such as the intensity and frequency of tropical cyclones, tsunami and terrestrial floods. Other research interests also include long-term landform evolution. Specific research interests include plunge pool deposits (terrestrial floods) and reconstructing tropical cyclone climatology from deposits of coral shingle and shell. He obtained a scoping study grant from the Sustainable Tourism Cooperative Research Centre working with Southern Cross & Curtin Universities.

Dr Alison Cottrell, is a Sociologist and lecturer in Human Geography in the School of Tropical Environment Studies and Geography. She has extensive knowledge of South East Asia and carried out doctoral research in Indonesia. A particular interest is in the use and development of qualitative research methods to approach complex environmental and disaster management and planning issues. During 2003/2004 Dr Cottrell has led the Communities sub program of the Bushfire Cooperative Research Centre. She is a Corporate Member of the Planning Institute of Australia.

Dr Douglas Goudie was a Consultant and Adjunct Lecturer in the School of Tropical Environment Studies and Geography until June 2003. With Linda's departure the postdoctoral fellowship funds have been transferred to appoint him as a Research Associate in the Centre for Disaster Studies to continue research activities in the Bureau of Meteorology supported project analysing risk perception and tolerance and how hazard prone communities receive, process and network hazard information. He completed a successful project on weather and hazard information in remote & Indigenous communities and has commenced a project on the vulnerability of people from non English speaking backgrounds. Dr Goudie is a Corporate Member of the Planning Institute of Australia.

Jordahna Haig is Coordinator and research officer in the Centre for Disaster Studies, and is a student in the School of Tropical Environment Studies and Geography. She has taken over Linda Anderson-Berry's former role as the primary contact person for the Centre, and has completed an EMA research grant to compile a web based database of Cyclone studies. In developing this

research she has also upgraded and improved the Centre's website to make it our primary contact with the world.

Dr Sue McGinty, is the Director of Research in the School of Indigenous Australian Studies. She collaborates with the Centre as a joint supervisor of Eddie McLachlan and has contributed to hazard projects concerned with Indigenous Communities.

Scott Cunliffe, is a PhD student in the Centre and Consultant Tourism Analyst. His research project on Tourism Industry Risk Management in Tropical Coastal Areas is concerned with modelling tourism futures through the use of a web based Delphi process. He obtained a scoping study grant from the Sustainable Tourism Cooperative Research Centre working with University of Queensland.

Eddie McLachlan, is a PhD student jointly in the Centre for Disaster Studies and School of Indigenous Australian Studies funded by the ARC and Queensland Health to examine Indigenous knowledge of hazards and community vulnerability to disaster.

Yetta Gurtner has continued work on a PhD with the Centre on impacts of human generated hazards, specifically tourism and terrorism, the Bali Bombing and the process of recovery. She has studied extensively in Indonesia.

Margaret Spillman is employed as a research officer with Alison Cottrell in the communities sub program of the Bushfire CRC.

Luke Balcombe is a masters student researching the interaction of communities and the bushfire hazard in Queensland.

The following students are researching physical processes of floods, cyclones, surges and tsunamis etc. with Jon Nott in Cairns.

Shaun Flay, PhD student TESAG, constructing a revised record of the magnitude and frequency of Tropical Cyclone landfalls in Queensland.

Michael Gutteridge, PhD student TESAG. The historical record (last 300 years) of Tropical Cyclone impacts in Queensland.

Anthony Williams MSc student TESAG, long term record of Tropical Cyclones from beach ridge deposits in Queensland.

During the fieldwork and data sorting phases of large research projects the centre has employed a large number of casual research assistants.



## **Research Project Descriptions and Activities in 2002 and 2003**

### **1. Bushfire CRC Communities Program**

Dr Alison Cottrell is a social researcher who is part of the research team in the Centre for Disaster Studies at James Cook University. She has undertaken a number of related activities over the financial year.

- continued as Sub-Program leader to the Understanding Communities Subprogram, C1 in the Bushfire Cooperative Research Centre. The activities of this project for the first year (since August 2003) have mainly been to establish the research group, explore the issue with stakeholders and prepare a literature review of relevant materials.
- attracted a grant of \$ 6,500 from Emergency Management Australia's, Adding Value Project: to communicate results of previous research to local governments in areas affected by the northern wet season. This resulted in the development of a pamphlet which encourages local councils and counter disaster organisations to more actively involve women and their support networks in preparations for the wet season. (Copy attached). When we have a current version of the EMA logo the pamphlet will be released for use. Townsville City Council and Thuringowa City Council have expressed interest in contributing to further development of this product if other funding becomes available. Mackay City Council has indicated it would be prepared to deliver and promote a pamphlet once it is developed. A poster that arose from this work which was presented at the 2004 International Conference on Storms will be produced in CD format and supplied to the Disaster Mitigation Unit to supply on request to councils and counter disaster organisations.

## **2. The Post-Doctoral Bureau of Meteorology ARC Linkage Project**

Summary of original objectives of project

The primary aim of the post-doctoral research is to continue basic community research within the Cairns Northern Beaches community, the same community that was the focus of the primary investigators doctoral research. While the doctoral research concentrated on evaluating, understanding and changing levels of cyclone awareness and preparedness, the post doctoral research has been designed to extend that knowledge through an analysis of risk perception and tolerance. It is examining ways in which this, and other similar hazard prone communities receive, process and network hazard information. Additionally, the research will investigate more generally how hazard prone communities evaluate risk, educational effectiveness and changing awareness and preparedness

The Post-Doctoral Linkage Project commenced on June 1, 2002. Details of research project activity to date include; the preparation of and participation in four major projects, one of which is ongoing; the preparation of four papers to be considered for publication in international journals; the preparation of three presentations for an international conference; the preparation and delivery of various seminar and workshop discussion papers; meetings with various government and industry organisation representatives (including a West Australia Parliamentary committee); and the preparation and delivery of educational materials.

### **3. Communicating the Tropical Cyclone Risk to Backpacker Tourists in Cairns**

This project built on and completed a research project that was commenced in 2001. It was carried out with the support of Cairns City Council, the Bureau of Meteorology and Queensland Department of Emergency Services. Survey work was carried out by two international students under the direct supervision of the director and the post-doctoral researcher.

Cairns is one of Australia's primary tourist destinations. International and domestic visitors to this tropical cyclone-prone region are often unaware of the tropical cyclone risk and are therefore considered to be particularly vulnerable to the impacts of this natural hazard. Backpacker tourists are likely to be particularly vulnerable because of the characteristics and attributes of this group of travellers.

The majority of backpackers to Queensland are adventurous young adults, aged between 20 and 30 years old. They tend to be well educated with the majority having completed tertiary education at some level. Most non-domestic backpackers originate from Europe and demonstrate some competency in both written and spoken English. They are usually long-term travellers, often in the country for up to 12 months, and are therefore likely to find themselves in a cyclone prone region at some stage during their holiday. Their most popular choice of transport is bus or car and they are likely to travel either alone or in small informal groups. Commercial accommodation is usually sought in backpacker hostels, budget hotels, caravan parks and camping grounds.

A study carried out in Cairns in 2001 confirmed that while backpackers' decisions about destinations and accommodation are often based on word-of-mouth recommendations, they actively and determinedly seek additional information, primarily from travel guide books and increasing from the world wide web (internet). The study, which was carried out during the non-cyclone season, found that cyclone awareness among backpackers to Cairns was limited and that there was little information about cyclones readily available in the guide-books or at most commercial backpacker accommodation. The results of a follow-up study carried out in Cairns during the 2002-3 cyclone season confirmed the findings of the previous study and identified the primary sources of 'sought for' information and modes of communication between and among backpackers.

A report of the findings of this project has been prepared for stakeholders and recommendations are focussed on providing advice for the providers of hazard awareness information to backpacker tourists. A paper detailing the findings of the 'Cyclone Awareness and Preparedness Amongst Backpacker Accommodation Providers and Backpackers in Cairns' studies, and discussing the implications of the findings in terms of appropriate means and media for communicating cyclone awareness and risk information is to be prepared for publication in an international journal and a presentation, based on the paper will be presented at the EMA Conference in Canberra in September.

## **4. Disseminating Weather Forecasting Information for Indigenous Communities in Australia**

Administering Organisations: Centre for Disaster Studies with the School of Indigenous Australian Studies, James Cook University.

Research Personnel: Dr David King, Dr Alison Cottrell, Dr Sue McGinty, Dr Douglas Goudie, Eddie McLachlan, Yetta Gurtner and Bureau of Meteorology staff.

Research Leader: Dr Douglas Goudie

### Research

From July 1, 2003, Dr Goudie embarked on a joint Australian Research Council research consultancy with industry partner Bureau of Meteorology: Weather warnings in and through remote Indigenous communities. I lead a team of five researchers to interview key members of 18 remote Indigenous communities across northern Australia. This aimed to make clear what warnings of disruptive weather were needed for such communities, and how to make such warnings as effective as possible to trigger precautionary, safety-oriented responses. The active fieldwork from September to December 2003 formed the basis of 14 weekly reports, distributed to relevant BoM staff and communities. Two days of meetings were held with BoM staff in Melbourne in December 2003, resulting in refinement of 23 recommendations. A 250 page report, including a broad literature review, was posted to the web in May 2004 to gain Indigenous community and BoM feed back. The project is ongoing.

In June 2004 Dr Goudie held meetings with the Director of the Townsville Migrant Resource Centre and other officers, to begin the pilot of an eight month research project (to become national) of disruptive weather warnings in and through Non English Speaking Households (NESH), sharing goals with the Indigenous project.

### Output

- A 250 page web-based report (currently at [http://www.tesag.jcu.edu.au/CDS/reports/Gou\\_IWWRpt/](http://www.tesag.jcu.edu.au/CDS/reports/Gou_IWWRpt/))
- Workshop paper for Safer Sustainable Communities 2003 Australian Disaster Conference held in Canberra, 10-12 September 2003: A preliminary view of weather warnings and hazardous weather knowledge in Indigenous communities.
- Seminar, TESAG, May 13: Weather warnings in remote Aboriginal Communities - a journey into changing Cultures.
- Development of three disaster book chapters: Transport and evacuation planning; Weather stories, old and new, and Weather knowledge and risk communication in remote Australian Indigenous communities.

### Fieldwork Objectives:

To investigate the way weather forecast messages and warnings information are disseminated to and through indigenous communities.

- a) Document current practices for weather and warning information for indigenous communities;
- b) Document examples of indigenous knowledge that contributes to understanding and interpretation of weather and hazards and to interpretation of Bureau delivered warnings and messages;
- c) Identify community needs for weather and warning information; and
- d) Assess the appropriateness or otherwise of current practices in the light of community needs.

Methodology:

- a) Review of existing literature on the way weather forecast messages and warnings information are disseminated to and through indigenous communities. This will draw on existing resources and case studies in the Centre for Disaster Studies and will gather additional written accounts and resources. We expect to collaborate with Alan Skertchley, Moya Newmann, FESA, QDES, BoM regional offices, Northern Territory University, the Land Knowledge CRC, and to relate research to the Indigenous weather knowledge work at the Bureau of Meteorology. This part of the study will begin in July concurrently with community case studies.
- b) Key informant interviews of Bureau of Meteorology staff on current practices and researchers, emergency managers, indigenous community personnel and leaders.
- c) Conduct participatory fieldwork in indigenous communities to gain understanding of their situations regarding delivery of weather and warning information. This will involve some visits to case study communities and utilisation of contacts of community personnel, researchers and leaders through the School of Indigenous Australian Studies. Research methods will use qualitative open ended interviews and discussions alongside a structured questionnaire. Case studies will include Fitzroy Crossing, Kununurra, Broome, Halls Creek, Bililuna, Alice Springs desert communities, remote Torres Strait islands plus Thursday and Horn Islands, Bamaga, Seisia and Injinoo, Wujal Wujal, Mornington Island, Mapoon, Pompuraaw, Yarrabah and Palm Island, and institutional information gathered in Perth, Alice Springs, Darwin, Cairns, Townsville and Weipa (July to October 2003). We are using an open ended qualitative community survey. This has to be approved by the University Human Ethics Committee at its next meeting on June 25<sup>th</sup>. The questionnaire form is attached. It is hoped that one of the team, along with a Bureau member may be able to accompany Gordon Tiddums of FESA on their annual pre wet season community education visits. If this can be arranged, there may be some modification of the fieldwork itinerary.
- d) Evaluation and report production were completed by January 2004.

## **5. Natural Hazard Vulnerability, Awareness and Mitigation Strategies for Remote and Indigenous Communities.**

Eddie P. McLachlan. APAI. Award. Research Partner Queensland Health.

Remote communities in Northern Australia regularly experience the impact of tropical cyclones and floods, but because of their smallness and remoteness must deal with the crisis with the minimum of external support. This study will improve our knowledge of how remote communities cope with cyclone and flood impact and has measured levels of awareness and preparedness, and social and community vulnerability. The study has developed a model of how predominantly indigenous communities deal with and prepare for cyclones and it will give guide the preparation of educational material and information oriented towards indigenous and remote communities.

### **Summary of original objectives of project**

There were six main aims to this research project:

- the creation of a history of cyclones in each community, recording the positive virtues of this experience alongside the description of the events, the impact and recovery, and through these accounts provide a reminder to the community of the danger and power of these events;
- the measurement of vulnerability, based on census and building characteristics, indexed against coastal cities for comparative purposes;
- the measurement of household awareness and preparedness, with special attention towards cultural values;
- collection of community strategies for protection, evacuation and recovery related to the vulnerability, awareness and preparedness surveys;
- to promptly return to the community the results of the surveys in order to assist that community in assessing its strengths and weaknesses in dealing with future cyclone threats, thereby improving its ability to mitigate against disaster and reduce or control vulnerability;
- to develop a methodology for awareness and preparedness planning and education that may be offered as a template to other remote and indigenous communities.

Milestones reached by mid 2004

At final stages of thesis write up.

## **6. Tourism and Terrorism. Bali: A Case Study in Crisis Management:** Yetta Gurtner

As an industry, successful tourism relies on the perpetuation of images and perceptions of peace, tranquillity and safety (Pizam and Mansfield 1996). Risk and fear – whether real or imagined - are strong determinants in the decision making process of the travelling public. In a volatile and unpredictable world climate however, it is increasingly apparent that no destination is immune from hazards and/or disaster. It is within the community's capacity to adequately prepare and respond that an adverse event can escalate to enduring crisis conditions.

The World Tourism Organisation (2003) defines a crisis as “any unexpected event that affects traveller confidence in a destination and interferes with the ability to continue operating normally”. More specifically Sonmez, Backman and Allen (1994) use the term “tourism crisis” to describe circumstances;

“which can threaten the normal operation and conduct of tourism related businesses: damage a tourist destination's overall reputation for safety, attractiveness, and comfort by negatively affecting visitor's perceptions of that destination; and, in turn, cause a downturn in the local travel and tourism economy and interrupt the continuity of business operations for the local travel and tourism industry, by the reduction in tourist arrivals and expenditures.”

Given the fickle nature of media and public attention it would take relatively little to precipitate a tourism crisis for a destination. Academics and industry authorities recommend the development and institution of an integrated crisis management plan to help insulate the tourism sector and associated stakeholders from any potential adversity (PATA 2003, WTO 2003). Reality demonstrates that relatively few destinations or communities have implemented any such planning (Beirman 2003).

Following the terrorist bombings of October 12, 2002 it has become abundantly clear that the popular tourist destination Bali was ill-prepared, ill-equipped and highly vulnerable. In the absence of an operational crisis management plan it has had to react and respond from a position of immense pressure. Having developed a high level of socio-economic dependence on tourism revenues the impacts and flow-on effects from this tragic event have been significant. As all levels of government, businesses, organisations, agencies and the community have worked to achieve recovery and greater resilience this experience has demonstrated some of the complexities in realising a sustainable holistic, participatory management process.

Through the events, issues and initiatives of Bali it is hoped to develop pertinent recommendations to make crisis management more practical, accessible and applicable, particularly for vulnerable tourist-reliant destinations. As tourism is likely to remain an insecure and erratic industry it is important for all associated stakeholders to have the requisite knowledge and understanding to develop and maintain feasible crisis management strategies.

## **7. Tourism Industry Risk Management In Tropical Coastal Areas**

Scott Cunliffe

This project is in the final stages of write up as a PhD thesis, and incorporates funding and commitments to the CRC for Sustainable Tourism.

The overall aim of the research is to investigate expert opinion on the future development of, and risk management scenarios for, tourism in tropical coastal areas by examining the likely hazards, vulnerability and exposure to various risks. The focus of the project is on forecasting the risks and hazards that the tourism industry will face in the next twenty-five years and fifty years. This will require a qualitative analysis using the Delphi technique as a survey method. By compiling a panel of experts from around the world, forecasts will be developed by achieving a general consensus on the survey results amongst all panellists.

The objective will be to forecast quantitative and qualitative factors of growth and development of the tourism industry in tropical coastal areas relating to total risk. Hazards and the risks those hazards pose for tourism development, will be assessed independently and cumulatively, which may generate a means of indexing risks and risk management for tourism. The hazards included in the analysis include both natural and anthropogenic hazards.

Expert Delphi panellists were drawn from 22 different countries and from a variety of disciplines. Consensus amongst the panellists was largely achieved through the iterative process of the Delphi technique. Preliminary results from the survey offer insights into likely long term planning and risk management needs of the tourism industry for such issues as likely key factors affecting destination choice, likelihood the occurrence of major catastrophic events (natural and man-made), future transportation preferences, likely future insurance and risk sharing mechanisms for hazards having and impact on the tourism industry, and a number of other futures forecasts for hazards and tourism in tropical coastal areas. A full analysis of the primary research will be completed in July.

## **8. Tourism Risk Management for the Asia Pacific Region**

A Crisis management manual was prepared for the Tourism Working Group of Asia Pacific Economic Cooperation (APEC). The Centre for Disaster Studies researchers contributed to the manual, titled "Tourism Risk Management in the APEC Region", in close collaboration with partners from the University of Queensland (CRC Sustainable Tourism), Hong Kong Polytechnic and the University of Hawaii. This project was completed in September.



## 9. Construction of a website listing current and previous post cyclone surveys from within Australia and around the world.

Jordahna Haig, with D.King, & J.Nott

### Project Background

In July of 2003, Jordahna Haig, the CDS coordinator, was awarded a research grant from Emergency Management Australia through their 2003-2004 projects program. The aim of this project was to collate and summarise post cyclone surveys from within Australia and around the world; which study the physical, psychological, environmental, response, meteorological, social and economic impact of tropical cyclones. This information is provided in a database, available via the Centre for Disaster Studies (CDS) website and accessible to the world. This database aims to act as a primary research and information centre for hazard professionals and practitioners.



#### 1.0 Database Construction

The construction of the database has been completed as is currently online for viewing at <http://manning.it.jcu.edu.au/~cyclone/> (with minor enhancements pending).

#### 2.0 Database Structure

By the launch date of the post cyclone database at the end of June, I hope to have in excess of 200 records (i.e. summarized reports) available for viewing and at least 300 by the end of the year. The database includes reports on the

physical, psychological, environmental, response, meteorological, social and economic impact of tropical cyclones. Records are summarized into the following searchable fields: Event, Location, Country, Title, Survey Type, Survey Aim, Keywords, Study Area, Methodology, Key Findings, Commissioned By, Funded By and Links to the full text where available.

We hope that by the end of its first year, the database will be able to update itself. We hope by then that the database would have developed a reputation amongst researchers and other organizations which conduct Post Cyclone Surveys to the point where all articles and related materials are automatically forwarded to Jordahna for entry into the database.

## **10. Research Infrastructure and Capacity**

### 2001 Census

Successful ARC applications attract research infrastructure block grants which are distributed to schools and to research groups. During 2002/2003 the centre obtained the full 2001 census of Australia through its contribution to ARC funding. Disaster vulnerability analysis of the census has been a core research area. Additionally many other researchers use the census, thereby enhancing the centres role as a research facilitator, and it is widely used in teaching especially in demography, planning and disaster studies.

The Centre occupies research offices and resource space on the Townsville campus along with items of equipment. The main office complex, resource space and computer laboratory of the centre is at the Cairns campus. Most of the centre's computers and office equipment are concentrated in the centre complex.

## **11. Cooperative Research Centres**

Involvement in two CRC's has developed soundly during late 2003 and 2004. The involvement of the centre in these programs promises to generate significant research activity over the next 5 to 7 years.

## **12. Book. Communities and Disasters (working title)**

Title: Communities and Disasters: Mitigation, Endurance and Recovery.  
Australasian Perspectives

Editors: David King and Alison Cottrell  
Publisher: Centre for Disaster Studies & James Cook University  
Discipline: Disaster Studies/Emergency Management  
(Geography/Environmental Science & Sociology)

All contributors are members of the Centre for Disaster Studies, details of which may be found at <http://www.tesag.jcu.edu.au/CDS/index.shtml>

Publication date: October 2004

Word length: 60,000

Page length: This will depend on the number of illustrations, which is negotiable, but in the range of 150 to 160 including references and index.

Illustrations/photos: negotiable, 5 to 10 per chapter with 13 main chapters

### **Market Description**

It is envisaged that there are many courses for which for which this book would be used as a text: Natural Hazards, Disasters and Emergency Management courses, many of which are embedded in Geography and Environmental Science.

We also envisage that this book will appeal to a broad market and is likely to be of use to practitioners such as Emergency Managers, Urban planners, Disaster Coordinators, and Hazard Managers

Websites that contain details about university courses which offer subjects in this discipline include the EMA website, and its journal AJEM which provides an example of the style that influences this book and the range of practitioners and potential readers.

<http://www.ema.gov.au/ema/emaInternet.nsf/HeadingPagesDisplay/AJEM?OpenDocument>

The Centre for Disaster Studies Website contains research reports, background on staff and students, publications and databases and is at:

<http://www.tesag.jcu.edu.au/CDS/index.shtml>

### **Project Description**

The book is concerned with the part played by people and communities in dealing with natural and human induced disasters. The emphasis is primarily on the social impact of natural disasters, with the linking thread being people and community participation as mitigators and participants. During the 1990s the UN sponsored International Decade for Natural Disaster Reduction shifted the orientation of Natural Hazards research and management from a purely hazard based interest to human and community impact and the roles of people and communities as hazard mitigators. In Australia the major emergency

management agencies at federal and state level have recognised this community orientation, while alterations to planning laws have involved town planners down to local government level in the role of planning for community hazard mitigation.

The Centre for Disaster Studies has played a central role in these developments, and through its participation in many disasters both within Australia as well as overseas in the Asia Pacific region, it has a wealth of experience, both theoretical and practical, that will be expressed in this book. The aim of the book is to inform and educate both students and the numerous practitioners and planners who are involved in this new emerging field of study. The book will review theory without being excessively academic, discuss and explain debates concerning community involvement, and illustrate with good examples and case studies of real communities. It is for this reason that we would like to include a wide range of pictures, diagrams and maps. The book will be interesting and readable for a broad audience, but soundly researched.

Two main types of readers are envisaged:

Experts in the field of Emergency management whose level of knowledge is high, most of whom are not particularly academic, but a group that also includes researchers – academic and applied;

Students, primarily at undergraduate level, whose knowledge may be limited, but whose scholarship skills are generally high.

The group of researchers in the Centre for Disaster Studies are drawn from the disciplines of geography, environmental studies, sociology, planning, tourism and indigenous studies. Some are senior academics, but half the contributors are research students. We are a group who work together, but each contributor was given a chapter topic and broad content by the editors, whose editorial task is to ensure consistency of style.

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## **Chapter Content. Approximate Status of where they are at**

### **1. Introduction: Physical Framework Natural Hazards**

The introductory chapter outlines the physical characteristics of the major natural hazards of the Australasian region, with an emphasis on the human environment interface, climate change and extreme events.

### **2. What Is This Thing Called 'Community': An Example In Far North Queensland**

Research on the awareness and preparedness for natural hazards of remote communities in Far North Queensland has resulted in a questioning of how we use the term 'community' in the context of planning for natural hazard mitigation. In this particular remote community, an immediate response by outsiders is not possible. The community themselves must respond. Therefore, the question arises as to how we define the community under consideration and how relevant this is to the reality of hazard planning. Are we describing what is really there, or what we want to be in place? Is the physical locality of importance or not?

### **3. Gender Culture and family**

We know from previous research that presenting information to communities without identifying their needs is ineffectual. Contemporary research in disaster studies indicates that emergency responses have tended to assume homogeneity of communities which ignores differing needs of various groups within a community. In addition, during previous research conducted by the CDS, we have become aware that at least some women do have strategies in place for dealing with the onset of the wet season in order that the impact on their families is minimised. The strategies appear to vary between women and communities and we need to understand these strategies and the rationale of the women themselves to capture benefits that might be applied more widely in the region. The strategies may well be influenced by particular facets of the location, or they may be a consequence of women's personalities, socio-economic status, and/or other factors. We are considering the situation of women living in Northern Australia who are regularly confronted with the potential hazard of heavy rainfall, including cyclonic conditions, which may result in their families being isolated from basic services. Women do have strategies for preparing for the wet season in Northern Australia. By discovering those strategies and incorporating them into information and education campaigns it may be possible to enable other women, particularly newcomers to the region, to adapt, and in so doing, increase their own resilience and agency.

### **4. Community Vulnerability Analysis**

Community mitigation of hazard impact requires hazard knowledge and preparedness on the part of the members of diverse and complex communities. Longitudinal research in the tropical cyclone prone north of Australia has gathered extensive datasets on community awareness, preparedness and knowledge, in order to contribute to education campaigns and mitigation strategies. Data have been used to identify issues of

vulnerability to cyclones and capacity to deal with the hazard. This has been developed as a community vulnerability and capacity model that may be applied to diverse communities in order to assess levels of capability to mitigate and deal with the cyclone hazard.

#### 5. Transport and Evacuation Planning

This chapter focuses on how to get out of the way of disaster impacts. At the conceptual level, disasters can be divided up into those with warning of more than a few hours, and those with warning of less than a few minutes. This chapter considers disasters with sufficient warning periods to be able to evacuate the vulnerable away from the worst impact areas. A JCU Centre for Disaster Studies 'Warned Disaster Matrix' is presented, indicating patterns of preferred evacuation independent of persons, threats and locations. This chapter also develops lessons and recommendations based on actual preparation for a major cyclone surge in Cairns<sup>1</sup>, developing planning recommendations and conclusions based on ESD and good sense. All the case studies explored in this chapter on evacuations come back to community safety and capacity building: involve and provide effective information and early warning to the community at risk.

Mine-related disasters have been included in this chapter because there are industrial threats which may have a lead-time sufficient to effect precautionary evacuations. In all disaster risk reduction work, the core goal is to minimise loss of life and injury. Reducing loss of expensive or highly

#### 6. Exceptional Disasters

This chapter examines the experiences of the more severe disasters that have occurred, especially events such as the Brisbane Floods, Cyclone Tracy and the Newcastle earthquake

#### 7. Tourism Crisis: Management And Recovery In Tourist-Reliant Destinations

The core case study in this chapter is of crisis recovery in Bali following the bombing, discussed within the broader context of tourism and terrorism and crisis recovery.

#### 8. Tourism and Natural Disasters

The future of the tourist industry and tourism in relation to natural and human induced hazards, as viewed by stakeholders and leaders within the tourist industry. Tourists are a dependent community within the host community, which in many instances is economically dependent upon that industry.

#### 9. Organisations in Disasters

In the event of a disaster, communities become the targets of specialist organizations and a concentration of activities. The complex unstructured activities and routines of daily life are disrupted and even totally overwhelmed by a single catastrophic event that requires a redirection of priorities, resources and people, to deal with all aspects of the disaster impact as rapidly as possible. The whole community must be mobilised to restore functions and

meet needs, to return to the normality of the pre disaster state. This latter purpose is least likely to be achieved, as the destroyed community can seldom rebuild to the same complex, but randomly haphazard state that existed before the disaster. To mobilise the whole community to a single purpose of recovery, requires a high level of organisation. Response to a disaster demands that there be purposeful organisations ready to provide leadership and action. Emergency Management is predicated on the existence of such purposeful organisations. However, while organisations are at the core of emergency management Response and Recovery they are by no means simple or singular. Disaster generates a plethora of organisations, which interact with the community, rather than simply organising disaster response. The community also organises itself, re-assigning priorities and using existing organisations and networks.

#### 10. Hazard Mitigation through GIS, Land Use and Development Planning

Models of emergency management identify hazard mitigation as a primary and continuous process in reducing hazard and disaster impact. Some aspects of mitigation, such as education and warnings, are directly the concern of emergency management organisations, but settlement, land use and infrastructure development are the primary business of planners and developers. GIS is a powerful tool available to both emergency managers and planners. The chapter examines some uses and limitations of GIS at the community level. Through planning legislation, the COAG Review and community expectations, hazard mitigation has become a core responsibility for planners and developers. This paper reviews those expectations and responsibilities and presents examples both of successful planning mitigation, as well as some failures to mitigate against natural hazards.

#### 11. Indigenous Hazard Knowledge in remote Aboriginal Communities

This chapter summarises a broad analysis of the ways in which people receive, communicate and understand hazard warnings in communities throughout Northern Australia. Issues of language, remoteness, culture and community organization are discussed and stories, traditions and examples of individual experiences are presented.

#### Indigenous Perspectives: Mornington Islanders

Complementing the previous chapter, elderly Aborigines on Mornington Island talk about their experiences of cyclones and storms, recounting traditional responses and practices, community experiences and traditional stories.

#### 13. Bushfire Preparation, Response and Recovery in the Interface Zone

Bushfire management shares the roots of all disaster management through the process of preparation, response and recovery. Wildland-urban interface areas exist wherever homes and other developments are intermixed among trees and other combustible vegetation. Also known as the interface zone, rural-urban interface or peri-urban developments, they are an increasing trend. Whether near large urban areas or remote rural locations, such interface zones are generating a significant population shift from urban living to increased living among the forests and bushland. Some wildland-urban interface areas may become prone to bushfires that can quickly grow to sizes



that require armies of fire fighters to control. When major fires do occur, they easily jump from burning vegetation to nearby homes. Obviously this causes major concerns, especially when there are many homeowners who move to the scenic wildland-urban interface not fully aware that they are living with increased risks from fire.

## Community Activities

Membership of Queensland Tropical Cyclone Coordinating Committee

Jordahna Haig is representative on Cairns Local Disaster Management Group.

Douglas Goudie was a delegate to the EMA Flood Management Workshop held at Mount Macedon in July 2004.

Disaster Management for Environmental Health training course in August of 2003, Cairns, Supported by Queensland Tropical Public Health Unit, Preparation and delivery of training materials and coursework subject in the Environment Health Managers Disaster Management Training Course.

Disaster Management Act 2003 training session held in Cairns on the 5th march 2004.

D.King & A.Cottrell attended the Queensland Government Department of Emergency Services Severe Weather and Flood Seminar for the 2003/2004 Season. Wednesday 5 November 2003 at the Townsville Golf Club, Benson Street.

D.King & A.Cottrell took part in Channel 7 documentary Life Up North.

D.Goudie - Training sessions – 2x 3<sup>rd</sup> year lectures in urban site planning for sustainability.

Media stories in the Central and Northern Burnett Times in late 2003 relating to allied Disaster Risk Management studies for the Eidsvold Shire, Queensland, 20 minute interview on ABC Radio National 24/5/4 and NQ ABC radio, 10 minutes, 25/5/4.

Meetings of North Queensland Chapter of the Planning Institute of Australia, - King, Cottrell & Goudie.

S.Cunliffe - World Futures Society Annual Conference – August 2003, San Francisco, California, USA

- Y.Gurtner. - Interview for JCU Outlook – Volume 15, No. 6 August 2003
- Interview with ABC Tropical North (Radio) - 20/08/03
- Research Contribution to Report for APEC Project “Tourism Risk Management for the Asia Pacific Region”
- Attendance at CAUTHE (Council for Australian University Tourism and Hospitality and Education Inc) Conference – Brisbane 10-13 February 2004
- Confirmation of Candidature Presentation – 1 March 2004
- 3 weeks fieldwork Bali 1- 19 May 2004
- Presentation at 2004 TESAG Postgraduate conference – 2 June 2004

D.King – numerous radio, newspaper & television interviews.

## **Disaster Education**

Staff of the Centre offer two university subjects that relate to hazards and disasters.

### **GE2454:03. Natural Hazards**

Staff: Dr J Nott. Cairns. Semester 2.

The subject examines the physical characteristics and causes of various natural hazards as well as the social consequences of these events. Emphasis is placed on planning for and managing these events in tropical urban environments.

Major topics: characteristics, causes, planning for and managing the consequences of the following: tropical cyclones (wind and marine inundation), earthquakes, tsunamis, storms and tornado, lightning, landslip, flood and drought, disease.

Learning Objectives:

1. to develop an understanding of the causes and characteristics of various forms of natural hazards affecting human society;
2. to recognise those areas within a region most prone to a particular type of natural hazard;
3. to learn effective planning strategies to mitigate the effects of hazards;
4. to learn management strategies in dealing with the consequences of a disaster.

### **GE3606:03. Disasters: Vulnerability, Mitigation and Planning**

Staff: Dr D King, Dr A Cottrell, Townsville, Semester 2

Disasters are a human construct, where a natural hazard interacts with a community, overwhelming emergency services and causing widespread loss. Planning for disasters is a multi-sectoral, multi-disciplinary process that involves understanding, analysing, mapping and measuring communities, their infrastructure and their physical characteristics and location. This knowledge is necessary for preparing people to deal with hazards, to mitigate against disaster and to recover from hazards that impact communities.

Learning Objectives:

1. provide an understanding of community vulnerability and its measurement;
2. assess a range of mitigation measures;
3. understand community awareness and preparedness for hazards;
4. assess the roles of all sectors of government and institutions in emergency management and planning responses;
5. understand the roles and limitations of public education;
6. use social impact methodology to assess hazard impact.

## Selected Publications

- COTTRELL, A. 2003 Community Action for Community Safety: A Residents' Flood Mitigation Committee in Townsville. Paper presented at the Safer Sustainable Communities Conference September 10-12, Canberra.
- COTTRELL, A., forthcoming (2004) 'What is this thing called 'Community': issues for hazard studies.' In: D. King and A. Cottrell (eds) Communities and Disasters. Centre for Disaster Studies, James Cook University, Townsville.
- COTTRELL, A., forthcoming (2004) 'Quiet achievers: women's preparations for seasonal hazards in northern Australia.' In: D. King and A. Cottrell (eds). Communities and Disasters. Centre for Disaster Studies, James Cook University, Townsville.
- Cunliffe S, - July 200. "Risk, Tourism and Future Management Needs". Hazards Conference Boulder Colorado USA
- Cunliffe S 2004. "Of the past, for the future: archaeology and tourism, a viable partnership?" World Archaeological Congress. Washington DC
- Cunliffe S. 2003. "Tourism and Cultural Risk Management"
- Cunliffe, S. K. (June 2003 - In Press). Tourism and Cultural Risk Management. FIFTH WORLD ARCHAEOLOGICAL CONGRESS (WAC-5) "Of the Past, for the Future: Integrating Archaeology and Conservation", Washington, DC, USA, Getty Conservation Institute.
- Cunliffe S. 2004 "Tourism and Culture at Risk" (In Press)
- Cunliffe, S. K. (June 2004 - In Press). "Tourism and Culture at Risk". Tourism: An International Journal.
- Nott, J. 2003. Waves, coastal boulder deposits and the importance of the pre-transport setting. Earth and Planetary Science Letters, 210, 269-276.
- Nott, J. 2003. Tsunami or storm waves? – Determining the origin of a spectacular field of wave emplaced boulders using numerical storm surge and wave models and hydrodynamic wave equations. Journal of Coastal Research, 19, 348-356.
- Nott, J. 2003. Intensity of prehistoric tropical cyclones. Journal of Geophysical Research, 108, D7, 4212.
- Nott, J. 2003. The urban geology of Cairns, Queensland, Australia. Quaternary International, 103, 75-82.
- Nott, J. 2003. The urban geology of Darwin, Australia, Quaternary International, 103, 83-90.
- Forsyth, A, and Nott, J. 2003. Evolution of drainage patterns on Cape York Peninsula, northeast Queensland. Australian Journal of Earth Sciences, 50, 145-155.
- Nott, J., & Bryant. E., 2003. Extreme marine inundations (tsunamis?) along the Western Australian coast. Journal of Geology (in press)
- Nott, J. 2003. The importance of prehistoric data and variability of hazard regimes in natural hazard risk assessment - examples from Australia. Natural Hazards 30, 43-58.
- Nott, J. F. 2003. Evolution of Australia's eastern highlands. In, Moritz, C. (ed.) Rainforests past and Present., University of Chicago Press. (in press)
- Nott, J., Price, D., & Nanson, G., 2002. Stream response to Quaternary climate change; evidence from the Shoalhaven catchment, temperate, southeast Australia. Quaternary Science Reviews, 21, 965-974..

- King, D. 2004. "Community Recovery and NGO Policy in the Developing World: A Case Study of Post Civil War Reconstruction in Sierra Leone." Paper presented at TIEMS Conference, Melbourne
- King D. 2004. "Understanding the Message: Social and Cultural Constraints to Interpreting Weather Generated Natural Hazards". International Journal of Mass Emergencies and Disasters
- Hoogenraad, Wouter, van Eden Ronald & King David. 2004. "Cyclone Awareness Amongst Backpackers in Northern Australia." Accepted by AJEM
- Anderson-Berry L. and King D. 2004. ."Mitigation of the Impact of Tropical Cyclones in Northern Australia through Community Capacity Enhancement". Special issue of Mitigation and Adaptation Strategies for Global Change ed. E.Haque.
- Anderson-Berry L, Keenan T, Bally J., Pielke jr R, Leigh R. & King D. 2004. "Societal, Social and Economic Impacts of WWRP S2000 FDP". Weather & Forecasting: Journal of the American Meteorological Society. Issue 19 No.1
- King D. & Gurtner Y. 2003. "Community Participation in Disaster Response and Recovery." Proceedings of Safer Sustainable Communities, 2003 Australian Disaster Conference, EMA, Canberra
- Gurtner Y. 2004. Article "Bali – the long road to recovery" submitted to "The Australian Journal of Emergency Management" (under consideration-for publication November 2004)
- Gurtner Y. 2004. Book Chapter –"Tourism Crisis: Management and Recovery in Tourist-reliant Destinations" in Communities and Disasters: Mitigation, Endurance and Recovery. Australasian Perspectives (in production) – February 2005

### **Cunliffe S. BOOK REVIEWS:**

Review for the European Union. Enterprise Directorate-General. Innovation Policy and Networks

EU supported tourism sector project:

Book title: "Coastal tourism, environment, and sustainable local development"

Editors: Noronha, L., Lourenço, N., et al

Publisher: TERI, New Delhi

Date: 2003, 468 pp.

ISBN: 81-7993-017-3

Review completed: 24 April 2004

Review for Routledge Economics Books (London)

Taylor & Francis Group

Pre-publication manuscript review

Book title: "NO BLANK CHEQUE"

(crisis management in the European Union)

Author: Marc Houben

Review completed: 24 October 2003

Review for Tourism - An International Interdisciplinary Journal (Croatia)

Theme: "Cultural differences in tourism". Pre-publication manuscript review

Article title: "The use of a Delphi study to identify implementation procedures for an urban cultural tourism initiative: The case of Indianapolis, Indiana, USA." Author: blind review. Review completed: 24 September 2003

Cunliffe S. 2004. Review for Environmental Management (ENM-03-0136), USA, Theme: "Cultural differences in tourism"

Article title: "Determining expert consensus as to the need for inclusion of ecosystem goods and services in the market system using the Delphi Technique."

Author: blind review

Review completed: 4 October 2003