



National Environmental
Research Program

NORTHERN AUSTRALIA *hub*

The NERP Northern Australia Hub: Tropical ecosystems on the other side of the Great Divide

Michael Douglas

NERP Northern Hub, Charles Darwin University

Outline

- Overview of the Northern Hub
- Research highlights
- Factors contributing to success

Biodiversity of the wet-dry tropics

- The region
 - Savannas, Rivers, Estuaries
 - Iconic areas
 - Pastoral, Indigenous & Conservation land management
- Issues
 - Mammal decline
 - Development
 - Climate change



Goal: to improve biodiversity conservation in northern Australia through

- High quality research
- Innovative policy & management
- Strong partnerships



Northern Hub: Research questions

1. How can we **halt or reverse** biodiversity loss that is already occurring?
2. How can we **prevent** the loss of biodiversity in systems currently in good conditions?
3. How can we improve **planning** for biodiversity conservation and other objectives?
4. How can we improve partnerships and livelihood options to support biodiversity **management** and **monitoring**?



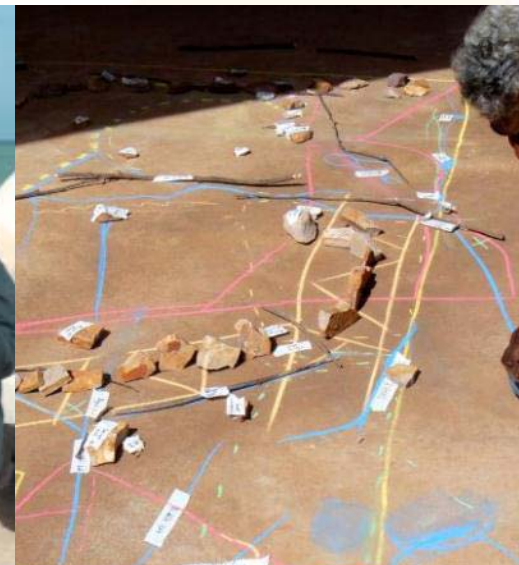
1. Planning and Sustainable Financing

- Catchment to coast planning
- Opportunities for biodiversity conservation on pastoral land
- Improving the efficiency of biodiversity investments



2. Indigenous NRM and livelihoods

- Measuring at the range of benefits of Indigenous biodiversity management
- Identifying opportunities for and constraints on Indigenous biodiversity management
- Support for adaptive planning on IPA's and with WOC rangers



3. Aquatic Biodiversity Conservation

- Patterns of biodiversity
- River to wetland connections
- Threats to biodiversity from climate change (sea level rise) & weeds



4. Terrestrial Biodiversity Conservation

- Causes of mammal decline
- Cost and benefit of controls on IPA's and AWC properties



5. Biodiversity Monitoring and Reporting

- Partnerships with Indigenous rangers
- Terrestrial monitoring
- Aquatic monitoring



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Floodplain biodiversity in Kakadu National Park



Saltwater intrusion, Mary River floodplain



Courtesy Eric Valentine and Mike Miloshis, CDU

Saltwater intrusion, Mary River floodplain: 17,000 Ha



Para grass, Kakadu National Park



NERP research on Kakadu's floodplains

1. Which places will be lost, which places will be safe?
2. Which places are most important?
3. How do we manage floodplains for the future?

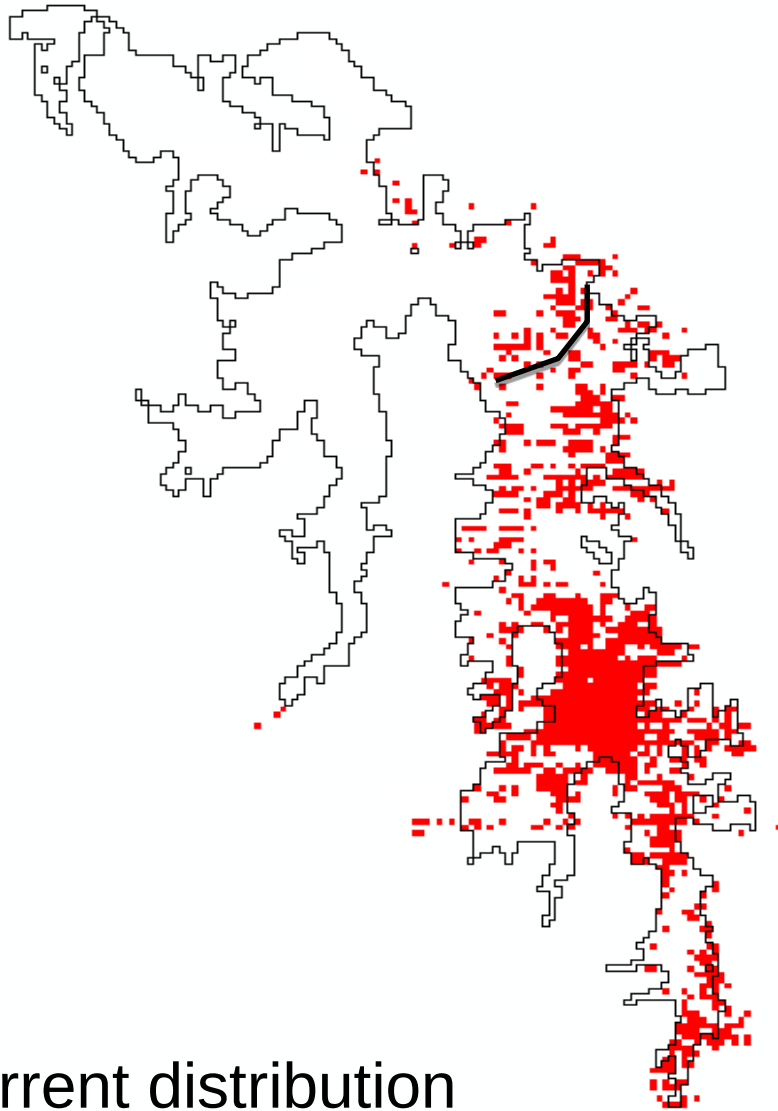
- 6 inter-related projects
- CSIRO, GU, CDU, AIMS, ANU, UWA

1. Which places will be lost/safe?

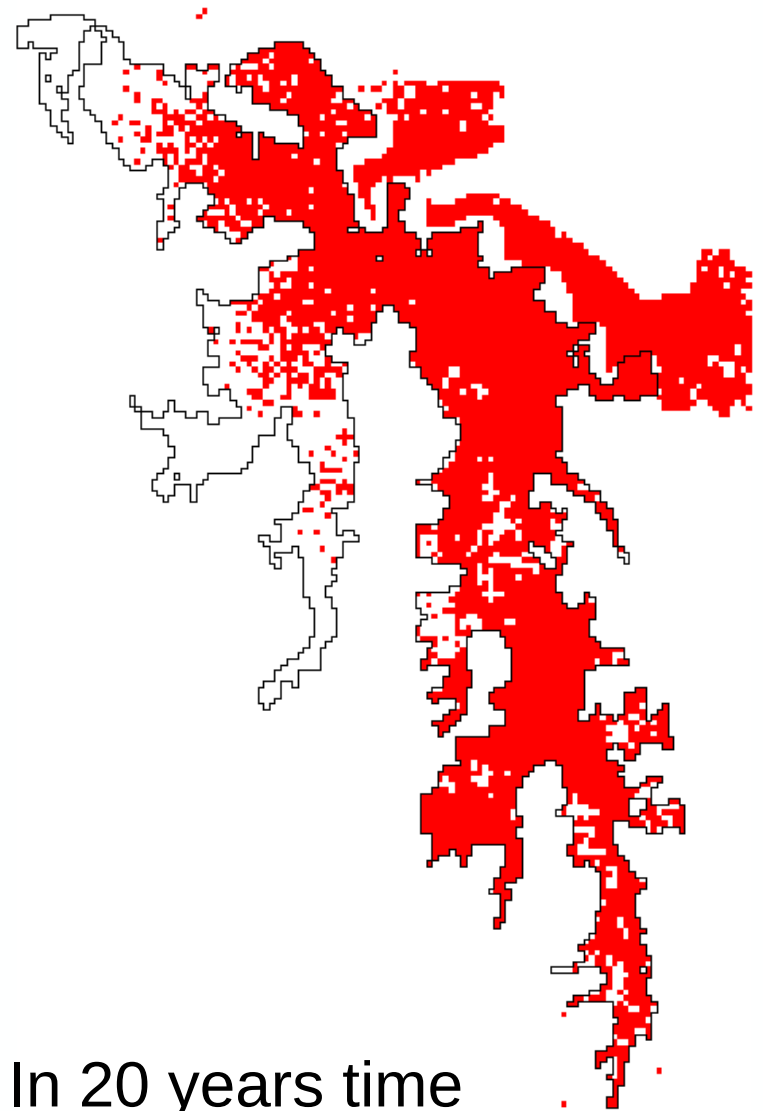
- LiDAR mapping & digital elevation model
- Hydrodynamic models
- Models of weed spread & habitat suitability
- Maps of future saltwater intrusion
- Maps of current & future weed invasion



Predicting weed spread: Para grass on Magela floodplain, Kakadu National Park



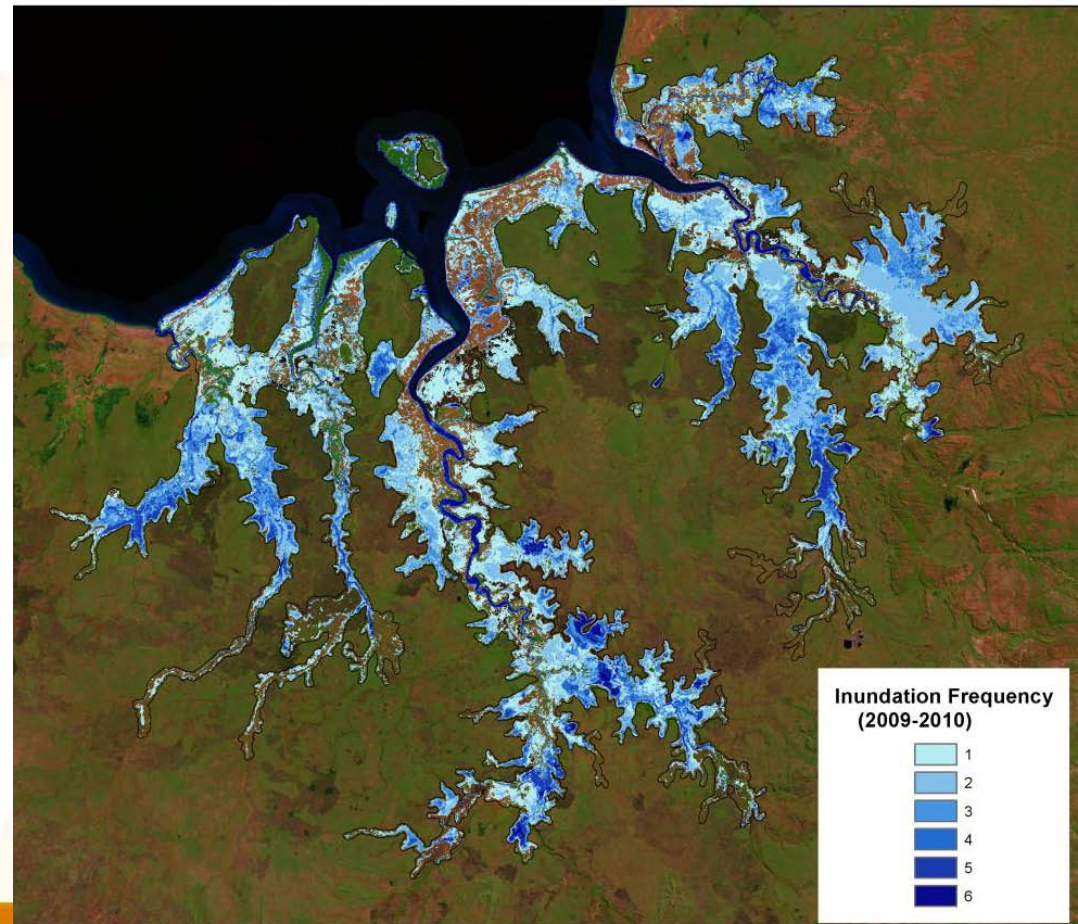
Current distribution



In 20 years time

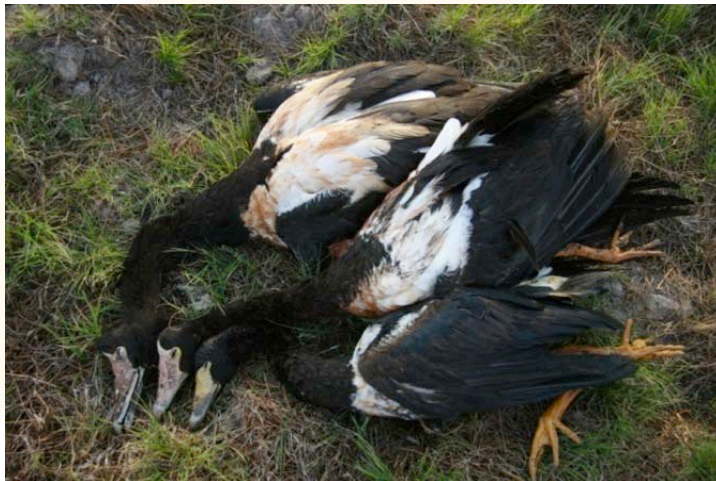
2. Which places are most important?

- Estuarine fish biodiversity surveys
- Inundation, vegetation & primary productivity maps
- Food web analysis
- Fish tracking



2. Which places are most important?

- Mapping Aboriginal use of floodplains



3. How do we manage floodplains for the future?

- Prioritisation tool for weed management
- Economic models of weed management
- Costed options for responses to sea level rise
- Management Strategy Evaluation
 - Future scenarios



Progress

- Consultation with Traditional Owners
 - Protocols to be adopted by Kakadu NP
- Jointly secured additional funds for LiDAR
- Providing advice for SEWPAC on weed management options
- Jointly seeking funds to implement recommendations

Integrated Catchment-to-Coast planning (Bob Pressey, JCU)

- Multiple objectives
 - Biodiversity, carbon, water quality, soil conservation
- Spatially uncorrelated
- Trade-offs
- Systematic conservation planning
 - Cross “realms” & multiple objectives

Approach

- Case studies
 - Gulf (Gilbert & Staaten Rivers) with Northern Gulf Resource Management Group
 - NT (Daly River) with Daly River Management Advisory Committee

Collation of freshwater species distribution datasets

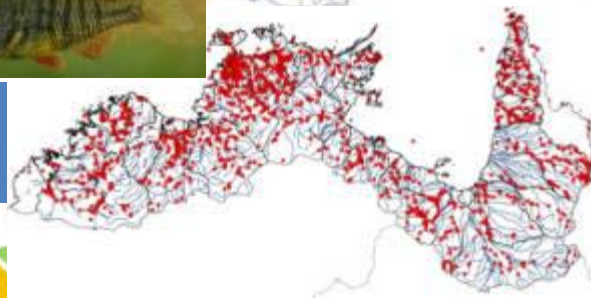
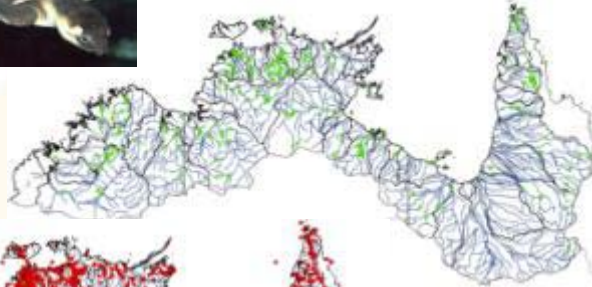
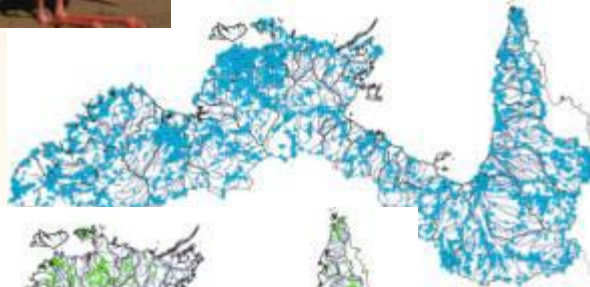
● Waterbirds



● Turtles



● Fish



Approach

- Case studies
 - Gulf (Gilbert & Staaten Rivers) with Northern Gulf Resource Management Group
 - NT (Daly River) with Daly River Management Advisory Committee
- Additional project (ACEAS funded) to link the case studies with other regions (Terrain, Reef Catchments, Kimberley)
- Researchers and stakeholders developing a general framework

Progress

- High level of confidence in the project through ownership of development
- High level of stakeholder buy in
- Case studies working well in each catchment
- Supporting stronger Indigenous representation in the Daly



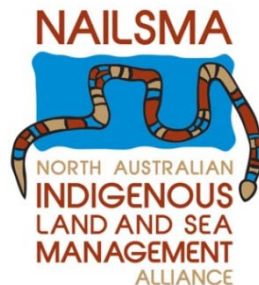
Partnerships and tools to support biodiversity monitoring by Indigenous land and sea managers

- Growing number of Indigenous ranger groups
- Increasing interest in monitoring
- Increasing use of I-Tracker
- Need for community-based and scientifically-robust biodiversity monitoring regimes



The Wunambal Gaambera Mangguru (marine turtle) and Balguja (dugong) Monitoring Project

- Collaborative project
 - Wunumbal Gaambera Aboriginal Corporation and its Unguu Rangers
 - NAILSMA
 - CSIRO
- Development of new survey method for turtles and dugongs
- Core components:
 - Community workshops
 - Field trips and training on country
 - Feedback and communication of outputs and learnings



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- **Factors contributing to success**

Factors contributing to success

1. Responding to an identified need or scope for co-identification of research questions
2. Clear pathway for adoption
3. Level of end user buy-in
4. Clear approach to Indigenous engagement
 - Research agreements/protocols
 - Training for researchers

Objectives of NERP NAH

Indigenous Engagement Strategy

1. Ensure NERP Northern Australia Hub research is relevant and can benefit Indigenous people including meeting identified Indigenous research and management priorities;
2. Ensure The NERP Northern Australia Hub research is conducted according to the highest ethical standards and respects Indigenous priorities and values;
 1. Provide opportunities for Indigenous employment, and transfer skills, share knowledge and increase cultural awareness amongst all parties;
 1. Effectively communicate research results and share knowledge with Indigenous people; and
 1. Ensure effective Indigenous participation in Hub governance.

Factors contributing to success

1. Responding to an identified need or scope for co-identification of research questions
2. Clear pathway for adoption
3. Level of end user buy-in
4. Clear approach to Indigenous engagement
 - Research agreements/protocols
 - Training for researchers
5. Applicable across the region



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