
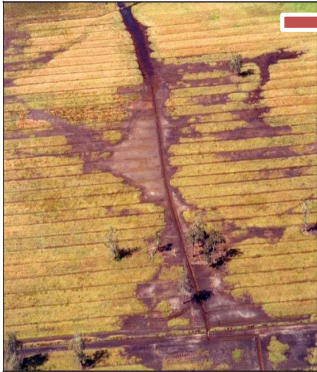


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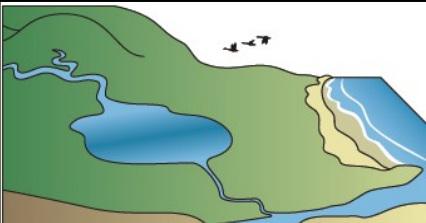
Restorative Engineering – Rebuilding the Environment

A/Professor Will Glamore



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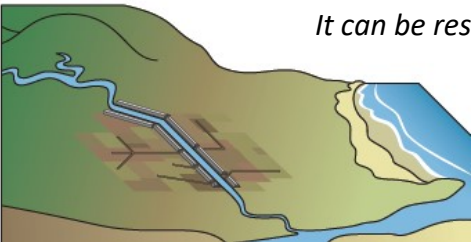




Our estuaries have been transformed.

We don't know what was lost.

It can be rescued.



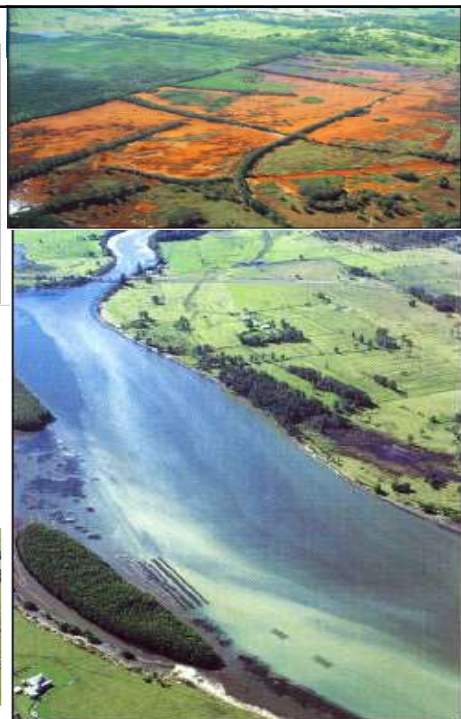
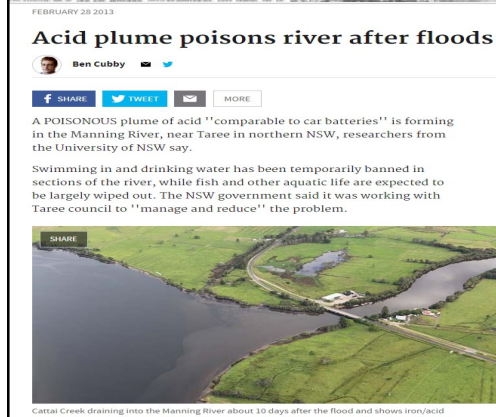
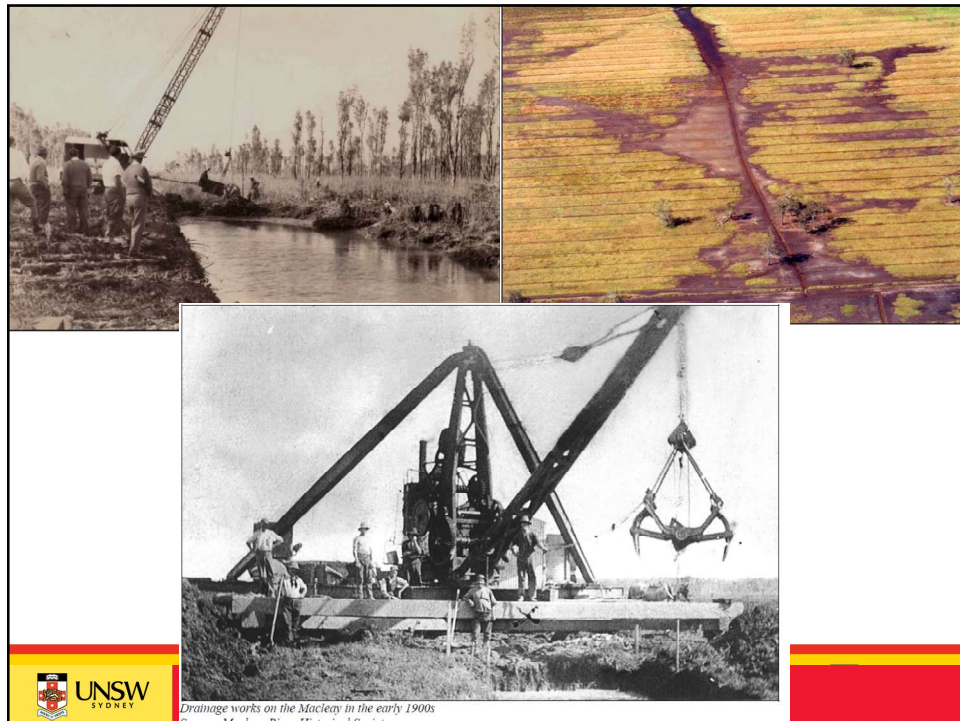
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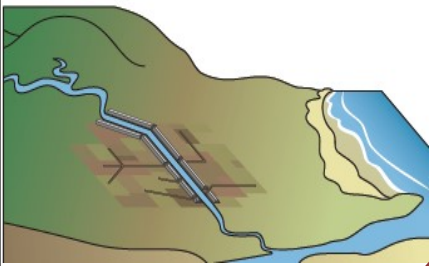
Richmond River Estuary



Richmond River Estuary








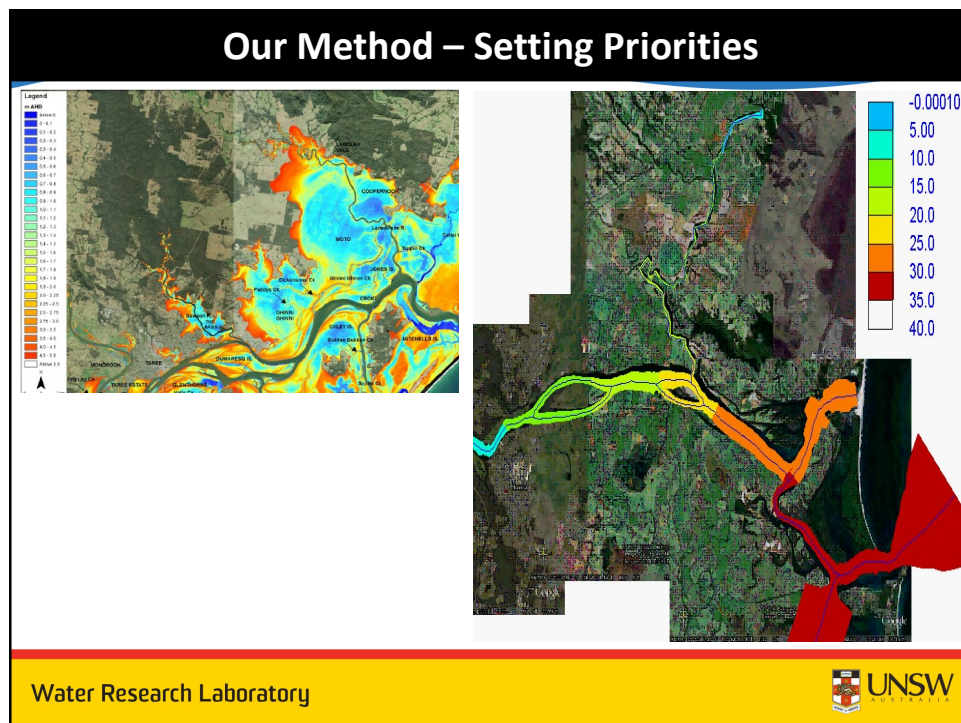
A large scale program is developing:
'Prioritise, Analyse, Repair'

Supported by:

- Tested methods,
- On-ground outcomes,
- Economic Value Assessments,
- Intergenerational justice,
- Restore forward approach.

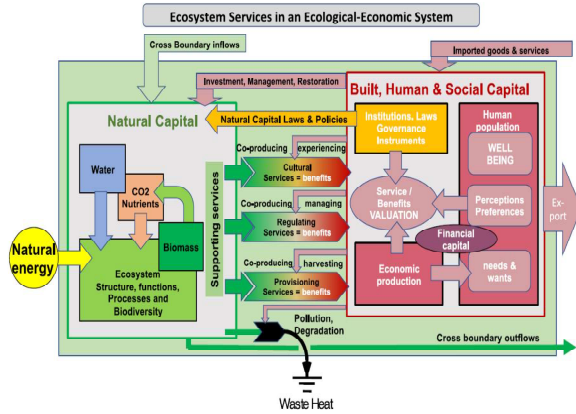


"Life can only be understood backwards, but it must be lived forwards.", Soren Kierkegaard



Economic Value Assessment

R. Costanza et al./Ecosystem Services 28 (2017) 1–16



Guidelines for using analysis to assess co management options



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2007 - Before



Hunter Wetlands National Park (500 ha)



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2017 – Restored

Before...

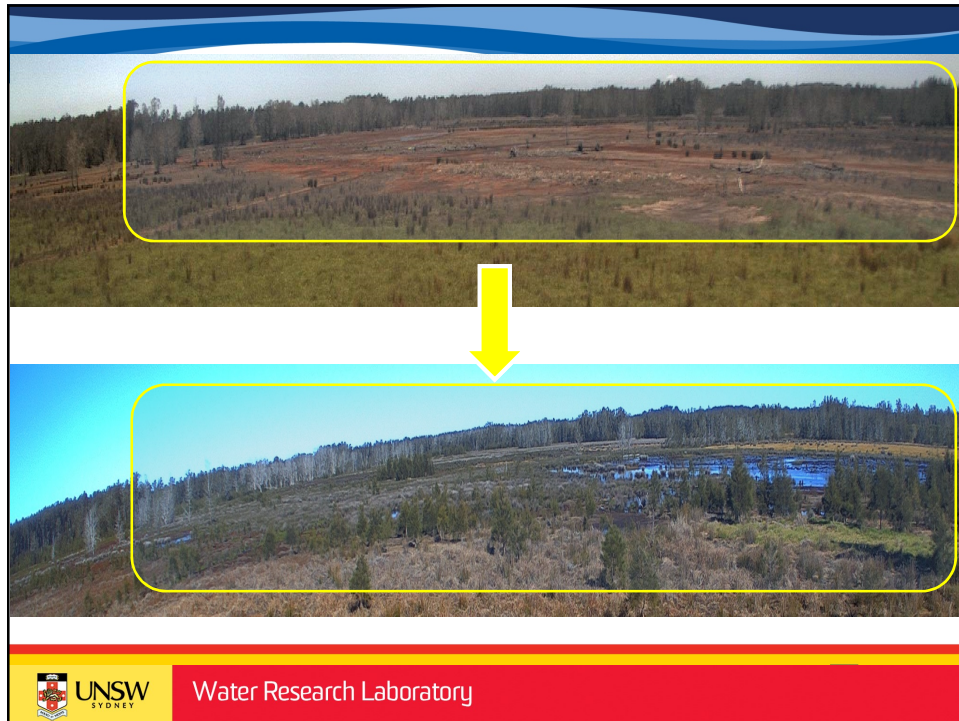


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...After



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Success requires understanding of:

- System values (what is important and why).
- Legal impediments.
- Planning instruments.
- Climate Change impact.



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Climate change in NSW estuaries State of the science & guideline for assessment

8 Modules: Free, Online, Best Practice

1	Introduction	Introduction to estuaries, their eco-hydrological system, climate drivers and climate change & framework for assessment.	Framework for assessment The conceptual workflow for the risk assessment
2	Determining changes in climate boundary conditions	Guideline on how to project and prioritize changes in estuary climate boundary drivers & summary of relevant changes in NSW	
3	Determining changes to the physical estuarine environment	Guideline on how to determine changes to the physical estuary environment resulting from changes in climate boundary conditions	
4	Estuary ecosystems & climate change - introduction	Assessing climate change impacts to estuary ecosystems, the role of the physical environment and feedback loops	
5	Existing stressors	Introduction to existing stressors to the eco-hydrological estuary system and interactions with climate change stressors	
6	Conducting the assessment - case study	Step by step practical guideline on how to assess climate change impacts based on two "case-study" estuaries in NSW	Collateral Modules
7	Estuarine species & climate change - Metadata Analysis	Review of climate change impacts in estuary ecosystems; metadata analysis on species-specific environmental thresholds & database	
8	Knowledge gaps, limitations and next steps	Knowledge gaps, ongoing and future research; recommendations for monitoring, infrastructure and adaptation programs	



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Interested?

3 PhD scholarships
available now:

1. **Prioritising Wetland Restoration**
2. Integrating Ecology, Hydrology and Land use
3. Cost Benefit Analyses for Assessing Restoration Options



01 MAR 2019 | PRESS RELEASE | ECOSYSTEMS

New UN Decade on Ecos Restoration offers unparalleled opportunity for job creation, security and addressing climate change

- The United Nations General Assembly declared 2021 – 2030 the Decade of Ecosystem Restoration.
- Restoration could remove up to 26 gigatons of greenhouse gases from the atmosphere.



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- Office of Environment and Heritage
- National Parks and Wildlife Services
- Hunter Water Corporation
- Local Land Services
- Councils (Shoalhaven, MidCoast, Hornsby, Newcastle City Council, Clarence Valley, Tweed)
- Office of the Chief Scientist and Engineer
- UNSW's Water Research Laboratory staff and colleagues



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