# How good is science!?

## EIANZ ANNUAL CONFERENCE

ONLINE 9, 10, 16 & 17 November 2021

## DAY ONE | ROOM ONE

### HOW INDIGENOUS PRACTICES OF SELF-GOVERNANCE BE INTRODUCED INTO MODERN SOCIETY?

Although there are still examples of traditional self-regulatory, self-management and self-governing practices around the world, and modern examples exists for firms, civic and sporting organisations there is no educational institution where this knowledge is taught. To avoid further degradation of our planet and its biodiversity there is an urgent need to format both traditional and system science knowledge in suitable forms to be disseminated through multiple channels around the planet. Traditional Australians have the longest continuous track record of indigenous practices. But other traditional cultures and system scientists could also provide alternative and/or complementary contributions in presenting details, practices and processes for knowledge dissemination. An outcome driven by distributed bottom-up decision making that is alien to authoritarian societies and democracies dominated by centralised command and control hierarchies not found in pre-modern societies. Education courses exist in Australia on how to teach Aboriginal general knowledge and recognise the various ways of sharing traditional knowledge but they do not seem to be focussed on if traditional knowledge and practices can contribute to mitigating and/or reversing the growing existential environmental threats. These arise from ever increases in population, declining bio diversity and the degradation of soils, oceans and atmosphere. The complex inter-related multidimensional existential threats from these problems require citizen led bottom-up solutions guided by top-down collaborations While a number of institutions now teach about traditional knowledge none are known to suggest that it can make crucial contributions to modern society. Neville Namarnyilk sees the need to reverse the modern mindset to exploit the environment to become its steward. The PhD research of Tyson Yunkaporta on 'Aboriginal Pedagogies at the Cultural Interface' is particularly relevant as are the credentials in education of Anne Poelina. The PhD research of Shann Turnbull established the science of governance in any species.

## SPEAKER BIOGRAPHIES

### SHANN TURNBULL

Shann Turnbull PhD graduated as an electrical engineer in Tasmania, a Melbourne University BSc, Harvard MBA and a PhD from Macquarie University, Sydney. He has been a serial entrepreneur founding new firms that included two public mutual funds and three firms that became public traded. His experiences as public company chair and/or CEO was increased by being founding partner in a private equity group that obtained control and re-organised eight public companies. He initiated and became a founding author of the first educational qualification in the world for company directors in 1975 when he published Democratising the wealth of nations. His bottom up reform proposals resulted in being commissioned by the Australian Government to undertake the first economic analysis of Aboriginal Communities in 1977. He was invited to Prague in 1990 & 1991, and to Beijing in 1991 to advise on stakeholder privatization. His PhD research introduced bytes as a unit of analysis to establish the science of governance in any specie. Shann has been a prolific author on reforming the theories and practices of capitalism by following the processes found in nature. Refer to **Bibliography/CV**

### ANNE POELINA

Anne Poelina PhD is a Nyikina Warrwa (Indigenous Australian) woman in the Kimberley region of Western Australia. Poelina is an active Indigenous community leader, human and earth rights advocate, filmmaker and a respected academic researcher, with a Doctor of Philosophy, Master of Public Health and Tropical Medicine, Master of Education, Master of Arts (Indigenous Social Policy) recently submitted a PhD (Health Science) titled, 'Martuwarra First Law Multi-Species Justice Declaration of Interdependence: Wellbeing of Land, Living Waters, and Indigenous Australian People'. Signatory to the Redstone Statement 2010, she is a 2011 Peter Cullen Fellow for Water Leadership. In 2017, she was awarded a Laureate from the Women's World Summit Foundation (Geneva), elected Chair of the Martuwarra Fitzroy River Council (2018), Adjunct Professor and Senior Research Fellow with Notre Dame University and a Research Fellow with Northern Australia Institute Charles Darwin University. Poelina is a Visiting Fellow with the Crawford School of Public Policy at the Australian National University, Canberra Australia Water Justice Hub to focus on Indigenous Water Valuation and Resilient Decision-making. Professional website: **www.martuwarrafitzroyriver.org** - **ORCID: https://orcid.org/0000-0001-6461-7681** - Personal website: **www.majala.com.au**

### TYSON YUNKAPORTA

Tyson Yunkaporta PhD belongs to the Apalech Clan from Western Cape York and resides in Melbourne. In 2019, he was a senior lecturer at Monash University in Indigenous Knowledges and now teaches at Deakin University. He also carves traditional tools and weapons, and is a published poet. In 2019, he published the non-fiction Sand Talk: How Indigenous Thinking Can Save the World. His PhD research at James Cook University was on 'Aboriginal Pedagogies at the Cultural Interface'. Other publications are: 2021, 'All our landscapes are broken: right story and the law of the land', Griffith Review, no. 72, Special issue: states of mind, pp. 1-1; 2018, No Cure for the Colour Blind "That serpent rainbow", Australian Poetry Anthology (p. 59); 2017, First Law "Systems isolated, closed, vacuum", Australian Poetry Journal, vol. 7 no. 1, (p. 21); 2017, 'I'm Part of the World's Oldest Living Culture, But Could I Kill a Zombie with a Boomerang? The Guardian Australia , 27 September;

### NEVILLE NAMARNYILK

Neville Namarnyilk is an indigenous man of the lightning totem from Kunbarllanjnja (Oenpelli) in the Northern Territory. He is an artist who speaks eight indigenous languages as well as English. He was educated in both traditional and modern realms. He is a schoolteacher, tour guide and a film actor in High Ground.

### PROFESSOR NORM SHEEHAN

Professor Norm Sheehan is a Wiradjuri man born in Mudgee, New South Wales. Norm's expertise is based on Respectful Design; a practical non-violating way for identifying and activating cultural strengths within Indigenous communities as a basis for relevant and wellbeing enhancing education and research. He is currently Honorary Professor at the University of Queensland (UQ), Co-chair of the Vice Chancellor's University of Queensland Reconciliation Action Plan Oversight Committee, member of the UQ Education Advisory Council, and expert advisor Indigenous Research to the UQ Human Research Ethics Committee. Norm is currently in receipt of philanthropic funding to conduct cultural cohesion research in urban Aboriginal contexts.

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## DAY ONE | ROOM TWO

### THE SOCIAL 'GLUE:' ALTERNATIVE CONSIDERATIONS FOR CREATING EFFECTIVE CIRCULAR ECONOMY HUBS

**AUTHOR:** Carolyn Cameron FEIANZ

As Australian food and agribusiness are rebuilding after the sequential shocks of drought, bushfires, floods and a global pandemic, alternative business models such as clustering and embedding circular economy principles are increasingly on the agendas of industries, governments and communities. While the literature in geography, regional science and economic development is rich with the physical, logistical and technological attributes of effective circular economy hubs and clusters, researchers have paid less attention to soft infrastructure – the 'social glue' (Porter, 1998 ) needed for high performing clusters. What is needed, in addition to understanding and applying the principles of a circular economy, is proactive consideration of the social dimensions required to underpin an effective economic cluster. One major consideration is understanding the current and preferred positioning along a continuum from competition to collaboration. The Food and Agribusiness Growth Center, trading as Food Innovation Australia Limited (FIAL) has recognised the limitations of 'hard' science and planning prescriptions and has compiled a Good Practice Guide showcasing a range of potential 'social' dimensions likely to contribute towards effective food and agribusiness clusters. Seven social dimensions for more effective clusters are described. There is no right or wrong application of the dimensions, only the provision of optional good practice guidance to assist decision makers as they come together to create clusters or build circular economy precincts.

## SPEAKER BIOGRAPHY

**CAROLYN CAMERON**

Carolyn Cameron has over 40 years' experience in environmental and strategic planning working with the mining industry, universities, state and national governments. She has worked in six states and territories in Australia, including developing on-line Masters-level courses, regional service delivery roles with the NSW EPA, and later with the Department of Primary Industries in Victoria, where she as a member of the North East Catchment Management Authority. More recently Carolyn was a Senior Executive with the national Department of Environment, leading teams to undertake strategic environmental and cumulative impact assessments across the country. Since 2015 she has been a senior consultant on complex environmental management projects, applying her skills in policy analysis, cumulative and strategic impact assessment, stakeholder engagement and strategy development with local and state governments, Departments of the Australian government, the Great Barrier Reef Marine Park Authority (GBRMPA), Jacobs and Food Innovation Australia Limited (FIAL). In all her roles, Carolyn has focused on working with industry and community stakeholders to develop and deliver practical strategies that incorporate good practice combined with grass roots input.


# DAY ONE | ROOM TWO

## MUSEUM OF UNDERWATER ART: LINKING SCIENCE WITH ART, EDUCATION AND COMMUNITY

**AUTHORS:** Rachelle Brown, Adam Smith, Gemma Molinaro, Al Songcuan, Nathan Cook

The Museum of Underwater Art (MOUA) is an innovative project combining underwater art, research and education in the waters around Gurambilbarra (Townsville), Queensland. The project increases knowledge, education, stewardship, tourism and conservation of the Great Barrier Reef. The first stage was installed in November 2019. 'Ocean Siren' is a large intertidal sculpture of an indigenous girl that changes colour and links art and culture with climate change. Coral Greenhouse is a 160 tonne, 12 x 6 x 7m stainless steel and concrete sculpture located 37Nm offshore at John Brewer Reef. It is a submerged sculpture in 18m of water and showcases reef restoration. Two more stages are proposed: Stage 2 at Bwgcolman (Palm Island) and Stage 3 at Yunbenun (Magnetic Island). Citizen science initiatives at MOUA engage the community with the artworks and the reef. In March 2021, a team of volunteers installed coral transplants in the artworks. These corals will increase the aesthetics of the area as well as attract wildlife. A pilot indigenous training program increased diving, boating, science and tourism skills and has led to jobs and further training programs. The sculptures and the associated reef issues have reached an audience of over 400 million people through over 400 news articles, social media and tourism.

# SPEAKER BIOGRAPHY

### RACHELLE BROWN

Reef Ecologic specialises in providing expert advice to design and implement innovative solutions to environmental challenges facing tropical marine ecosystems and the people who love and depend upon them. They bring over 40 years of experience at the leading edge of coral reef science, management and policy to provide insight, guide strategic actions and build capacity among the leaders of today and tomorrow to secure a more sustainable future. Reef Ecologic have implemented major projects in all the coral reef regions of the world. They are united by their love of coral reefs and a conviction that the considerations, decisions and actions they take can make a meaningful and enduring difference to the future of coral reefs

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### NOOSA YOUTH ACTION ON CLIMATE CHANGE

**AUTHORS:** Claudia Baldwin, Gary Pickering, Kate English et al

Today's young people are forming their worldviews and will be tomorrow's leaders making decisions about transitioning to a low-carbon future to deal with environmental and societal consequences of climate change. Many have 'eco-anxiety' about the future so need clear science to support and empower them to take action. This presentation presents outcomes of an online survey of Noosa youth to identify their knowledge about causes and mitigation about climate change, their level of concern and preparedness to take action. It found that 85% believe climate change is real, and most trust information provided by scientists more than other sources, but less than half understand the most effective mitigation actions. The information was used to design a Noosa Youth Climate Summit held in August 2021, at which secondary school students (grades 9-12) identified climate mitigation actions to champion with their families, schools, Council and beyond.

## SPEAKER BIOGRAPHY

**CLAUDIA BALDWIN**

Professor Claudia Baldwin (PhD UQ) is Co-Director of the Sustainability Research Centre and teaches Urban Design and Town Planning at University of the Sunshine Coast. Her research interests focus around engaging communities for change. She specialises in using participatory and visual methods to research institutional and social-environmental change and consensus-building on topics as diverse as water, coastal, rural and regional land use planning and management; and climate change adaptation; as well as affordable housing and ability and age-friendly communities. Her co-edited book with Lukasiewicsz, Natural Hazards and Disaster Justice: Challenges for Australia and its Neighbours (2020) addresses risk, resilience, participation, and justice related to disasters.

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### SCIENCE - AS GOOD AS THE HUMANS WHO PERCEIVE IT: LIMITATIONS OF 'GOOD SCIENCE' IN THE FACE OF SUBJECTIVITY (CASE STUDY FAKE NEWS)

**AUTHOR:** Michele Hartz

Perhaps our greatest modern limitation and challenge to producing 'good science' is how that science is perceived and interpreted by the public. We are all wrought with pre-existing subjectivity and Bias, which is only compounded by the subjective era of 'Fake News' in a seemingly "Post Truth" world. Born from predecessors such as sensationalism, propaganda, and 'yellow journalism'; the art of Dezinformatsiya, or 'Fake News', has never been so imperative for scientists and scholars 'who must engage' with it (Garrett K.R., 2017). An engagement that is necessary to give the 'facts' of Science a place for greater and more effective action towards human progress and sustainability. But in order to achieve this- we must first understand how the publics' subjectivity and the onslaught of 'Fake News' is presently (and arguably) the greatest block towards Science reaching that pillar. This warrants further research into " how and why citizens become (and sometimes remain) misinformed about science" with ``Fake News" at the helm- perpetuating the paradox of Fact vs Fiction (Dietram A. et. al., 2019). Anywhere from 67 to 80 percent of the public have been exposed to 'Fake News' and believe it is causing "confusion" (Watson A., 2021). A confusion with immense impact to our capacity to progress on key issues facing our sustainability presently and into future generations. We implore rigorous methodologies to minimise the effects of subjectivity when we create science. However, it is now time for science to turn to how we do this for the general public when they receive science. This takes us to the roots in our primal human behaviours, psychology, and biology. An evolutionary past and predisposition to the creation of rumours and lies and their perpetuation. This provides us with a pathway to combat public subjectivity putting science 'fact' ahead of fiction.

## SPEAKER BIOGRAPHY

**MICHELE HARTZ**

Michele Hartz is an enigmatic public speaker who's passion for the environment has translated to a number of commercial projects, along with her own consultancy practice E Coefficient which helps lead businesses and projects on how to sustainably capitalize on making an Impact 4 Good. She has depth and expertise advising and coaching as a strategic sustainable specialist across LCA's, EMS's and helping businesses certify to ISO standards. She has worked closely with government and industry stakeholders in facilitating investments into Clean Technologies here in Australia and into her own 6 figure businesses as a hands-on entrepreneur. She has also held the pleasure of having lectured and taught at Monash University for 'Cities in Sustainability' . Michele is sparked by the demands for innovation, the call for tenacity- and the challenge to align 'eco' inspiration commercial application bringing entrepreneurial and visionary qualities combined with board experience, directorship and startup experience to deliver out of the box, divergent, and inspiring sustainable projects.

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## EIANZ ANNUAL CONFERENCE

## DAY ONE | ROOM THREE

### GLOBAL PREVALENCE OF CUMULATIVE EFFECTS CONCEPTS IN EIA LAWS AND THEORETICAL CONTRIBUTIONS TO POLICY AND DECISION-MAKING

**AUTHOR:** Rebecca Nelson, L.M. Shirley

Most modern-day environmental problems are cumulative environmental problems caused by the complex aggregation and interaction of numerous individual causes of harm, contributing to large scale problems from biodiversity loss to climate change. By providing a framework for assessing and responding to complex interactions between larger projects, environmental impact assessment (EIA) law is an important legal context for considering cumulative environmental problems, and an important way to translate science for assessing cumulative effects into decision-making. This research evaluates the theoretical importance of cumulative effects concepts for EIA law beyond its technical value, to its potential benefits of (1) encouraging deeper engagement with values embedded in decisions about EIA; (2) encouraging wider participation in EIA, and (3) paving the way for regulatory 'ripple effects' outside EIA, to typically unregulated activities. The research then investigates the presence of cumulative effects concepts in national laws around the world, multilateral environmental agreements, and the policies of large multilateral development banks, showing that cumulative effects considerations appear in an overwhelming majority of these contexts around the world. Not only nations, but also financiers and other private actors should consider project-level cumulative effects considerations an accepted international norm for policy and decision-making. Against a theoretical background, this prevalence highlights the potential for deeper implementation of cumulative effects provisions to deliver more significant benefits from EIA law for policy and decision-making than have previously been appreciated. Analysing the legal functions of cumulative effects concepts in a sample of national laws suggests that the most significant benefits would arise if cumulative effects were considered comprehensively throughout all stages of EIA (including screening and post-assessment), rather than being confined to the assessment stage alone.

## SPEAKER BIOGRAPHY

**REBECCA NELSON**

Rebecca Nelson is an Associate Professor of Melbourne Law School in Environmental Law and Water Law. Her research focuses on environmental and natural resources law and policy, with an emphasis on empirical research and practical solutions. Dr Nelson is an Australian Research Council DECRA Fellow (2018-2021), leading a project that evaluates laws regulating cumulative environmental effects across diverse resources around the world. From 2010-2014, she led the Comparative Groundwater Law and Policy Program, a collaborative initiative between Water in the West at Stanford University and the United States Studies Centre at the University of Sydney. The Program focused on empirical research and stakeholder workshops to improve groundwater sustainability in the western US and Australia. Dr Nelson is an author of Water Resources Law (2nd ed, LexisNexis Australia) and over 40 other publications. Dr Nelson was the IAH (Australia)/National Centre for Groundwater Research and Training Distinguished Lecturer (2016) and the Law Council of Australia's Young Environmental Lawyer of the Year (2014), awarded for her contribution to water law and environmental law. Dr Nelson holds a Doctor of the Science of Law from Stanford University, a Masters in Law (Stanford) and Bachelor of Engineering (Environmental) and Bachelor of Laws (University of Melbourne).

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### THE ROLE OF SCIENCE IN ENVIRONMENTAL IMPACT ASSESSMENT FOR EMERGING OFFSHORE WIND ENERGY PROJECTS IN AUSTRALIA

**AUTHOR:** Naomi Campbell, Development Director, Star of the South

Star of the South is Australia's first offshore wind project, proposed to be located off the south coast of Gippsland in Victoria. Offshore wind is one of the world's fastest growing renewable energy technologies. The global offshore wind sector is forecast to grow from around 30GW of installed capacity today to 230GW of installed and committed capacity by 2030, as nations around the world look to their coastlines to expand their renewable energy capabilities. Star of the South has been leading the charge for offshore wind in Australia for several years. The project is in the feasibility phase with a range of scientific and site investigations underway since 2019, including wind and wave monitoring, marine mammal and bird surveys, fish studies and seabed mapping. Star of the South are progressing with numerous scientific assessments as part of its Environmental Impact Statement (EIS) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and the Environment Effects Statement (EES) under the Victorian Environment Effects Act 1978, some of which are a first for the Australian environmental impact assessment regime. This presentation offers environmental practioners, regulators and industry the opportunity to learn about the importance of science, the complexities of collecting environmental data in data deficient areas (Commonwealth and State waters), and the need for a balanced approach to scientific assessment versus scientific research for EIA. What are the key learnings for the audience from your presentation? The speaker will share learnings on: - the importance of science – baseline data – Marine Ecological Survey Program to inform EIA - finding the balance between science for research and scientific assessment for the regulatory process of EIA - using science to understand acceptability for project (offshore wind) EIA

## SPEAKER BIOGRAPHY

**NAOMI CAMPBELL**

Naomi is leading the Star of the South approvals process including environmental assessment and landowner consultation in her role as Development Director. During her career, Naomi has successfully managed the approvals process on numerous energy projects totalling over 3GW of electricity. Working on some of the UK's largest offshore wind projects, Naomi has extensive knowledge of the project lifecycle of an offshore wind farm.

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### ARE THREATENED ECOLOGICAL COMMUNITIES UNDER THE EPBC ACT SCIENCEY ENOUGH?

**AUTHOR:** David Francis

An integral feature of most definitions of the word 'Science' is that it involves a systematic approach to study or knowledge. From this we know that all scientific endeavor must be systematic. The Environment Protection and Biodiversity Conservation Act 1999 (the Act) is the Australian Government's key piece of environmental legislation. One of the matters protected under the Act are Threatened Ecological Communities (TECs). Most actions referred to the Australian Government under the Act relate to potential impacts on listed species or TECs. Given the important role the Act plays in the protection of TECs it is reasonable to expect that all aspects of their nomination, listing, description and assessment are based in science and should be systematic in their approach. Once nominated, the process of determining whether a community should be listed as a TEC follows a widely accepted scientific approach, however the nomination process is ad hoc and not systematic. While the Independent Review of the EPBC Act does not directly broach the nomination process of TECs, or how TECs are individually defined and described, it does identify there are issues across the Act pertaining to terminology and identifies that information is sometimes 'locked' in inaccessible formats. These are significant issues as they relate to the description, assessment and ultimate protection of TECs. In this paper I will identify a number of issues pertaining to the way TECs are described that do not accord with a systematic scientific approach and offer suggestions as to how these, and the nomination process, can be improved.

## SPEAKER BIOGRAPHY

**DAVID FRANCIS** B.Sc (Hons) FEIANZ CEnvP

David Francis is the Director of Francisii Ecology and has over 28 years experience in environmental planning and ecological assessments across eastern Australia and PNG. Through this work David has been involved with a wide range of projects that grapple ecological and environmental conundrums. This has included several broad scale vegetation mapping studies in Queensland, NSW and Victoria using mapping systems of each jurisdiction and/or Threatened Ecological Communities listed under the *Commonwealth's Environment Protection and Biodiversity Conservation Act 1999.*

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### WHAT DO TO WHEN SCIENCE AND POLICY AREN'T FULLY ALIGNED – SOME ANSWERS FOR THREATENED SPECIES IN CENTRAL QUEENSLAND

**AUTHORS:** Ailsa Kerswell & Julian Wall (2rog Consulting)

Ideally, scientific information would be deeply embedded and well aligned with policy development and implementation. However, policy development is often slow and not dynamic enough to incorporate new scientific information and ideas as they are developed. This situation is often experienced by environmental practitioners and their clients in central Queensland, where meaningful scientific information for threatened species has been developed over recent years, however policy documentation lags behind and integrating this scientific evidence into decision making is sometime challenging. This has negative consequences both for environmental impact assessment and also for driving improved biodiversity outcomes for threatened species. We are working across a number of projects to address these issues, including to understand and embed the latest scientific knowledge and techniques into impact assessments and conservation planning, as well as liaising with policy makers to review and refresh policy. Some examples that will be explored in this talk include, developing region-specific habitat definitions using the best available scientific information, raw data and expert elicitation; species habitat modelling using combined statistical and expert models; and impact assessment underpinned by detailed scientific research and monitoring. The outcomes of these projects include a contemporary, evidence-based understanding of where threatened species occur in the central Queensland landscape, the areas that may be most important for their persistence and improved outcomes of environmental impact assessment. The challenge of embedding the updated information in policy and gaining overarching acceptance from regulators for our novel approaches is ongoing. However, these principles and techniques are applicable across all parts of Australia and for any species or ecological community of interest. Applying them gives environmental practitioners opportunities to make best use of scientific information, whilst also pushing for better, evidence-based policy development and decision making.

## SPEAKER BIOGRAPHY

**AILSA KERSWELL**

Ailsa and Julian are principal consultants and directors at 2rog Consulting, a small strategically focused environmental consulting company. Both have formal post-graduate scientific qualifications and now work to develop and apply ecological knowledge to achieve good environmental outcomes. Ailsa's current work focuses on undertaking landscape scale environmental assessments and encouraging both clients and regulators to make better environmental decisions. She is involved in numerous advisory groups and is passionate about cross-sector collaboration to achieve outcomes both for people and the environment. Julian also thinks big and has considerable experience in large scale ecological assessment and strategic planning projects, particularly using spatial science and mapping techniques. His specialist expertise is in ecological condition assessments, monitoring, spatial analysis, climate change adaptation, and impact and risk analysis. He is also keenly aware of the interplay between human and ecological systems and strives to achieve pragmatic, sensible and sustainable solutions for the environments and communities with whom he works. Ailsa is based in south-east Queensland and Julian on the NSW mid-north coast.