

FRDC Bursary 2023-102 & 2023-067

2023-102 - Electric and Hybrid Maritime Expo North America and Conference (2024)
2023-067 - Investigative tour to World Fisheries Congress, Boston Seafood Show, and
World Fisheries Congress 2024 - Seattle March 3-7th 2024.

I was lucky to receive a bursary from the FRDC to attend the WFC and then the Electric and Hybrid Conference in Long Beach with a number of other recipients. I believe there are about 50 Australians here from AFMA, FRDC, UTAS, CSIRO, Murdoch Uni, DPIRDWA and me from Industry.

There are about 1800 attendees, and I would liken it to schoolies for research scientist and PHD folk.

I attended a lot of sessions and have only summarised those that I feel were relevant.

<https://www.xcdsystem.com/afs/program/Yf71aaK/index.cfm>

There are 71 separate sessions with most sessions having 4-8 presentations that vary greatly from the headline session. The conference is held over 5 levels at the Hyatt and connectivity is by lifts or escalators. It is a real challenge trying to get from level to level for different sessions.

Day 1

Fisheries strategies for changing oceans and resilient ecosystems

Description

FishSCORE2030 was endorsed as a decadal program by the UN Decade of Ocean Science for Sustainable Development. The program will build a global network of scientists, stakeholders, and practitioners to identify approaches to sustain marine fisheries, protect ocean ecosystem health, and secure equitable benefits from fisheries in a changing ocean. This workshop will provide an opportunity to learn more about the program and climate-resilient case studies and to engage in the effort to apply climate-resilient vulnerability assessments and implement effective strategies in diverse fisheries. Abstract: Building resilient fisheries is essential for ensuring the continued flow and equitable distribution of benefits, such as nutritious foods, economic benefits, and cultural traditions, that are necessary for achieving many of the SDGs. The UN Decade of Ocean Science endorsed programme FishSCORE (Fisheries Strategies for a Changing Ocean and Resilient Ecosystems) will form a network of collaborators from across the globe to develop the scientific information base needed to sustain resilient marine fisheries in changing oceans. This programme will integrate transdisciplinary knowledge into new understandings of how climate change will affect marine fisheries at local to regional scales, and moreover, how healthy marine ecosystems and resilient fisheries can be achieved in the context of these changes. FishSCORE will rely on co-development of products through ongoing collaborations between scientists and fishery practitioners in local and regional fisheries. This process will improve the scientific products, ensure they are tailored for applied

needs, and support their use in real-world fishery systems. This co-development and application approach will strengthen partnerships and build capacity for forward-looking resilience planning in marine fisheries across the globe, including in industrial and artisanal fisheries as well as in developed and developing countries.

The program seems lagging behind the work that has been done in Australia by AFMA and CSIRO in Climate Resilience and Adaption and also seems to have no reference point to Industry consultation. I asked if they had tried to link with Industry groups like Seabos and they accepted that this was a WIP still. Oceans Decade still feels like a pure conservation thrust rather than a “partnership” of marine users. I have connected with Kathy Mills and will follow this through.

There was not a lot of reference to managing risk in a changing environment although it seems clearly accepted that more data is needed to be made available, NOAA have a pretty neat data collection and management model that I have asked for information on. AFMA at least have developed a risk management framework for Climate and this was presented by Dan Corrie.

There was a common theme around the disconnect between Government policy and designing adaptive management protocols for the quickly changing oceans and species, Data was siloed in many countries and this was not being utilised to look at rigid harvest strategies that were in place in many countries (and many that did not have HS in place).

Ocean Decade also had a big focus on social outcomes and equality across nations.

There are many Climate variability Assessments available that include social/ecological components but they are still being developed from early stages. The NOAA link is worth a look <https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments>

Day 2

Plenary- Nexus

<https://vimeo.com/919346096?share=copy>

Scroll to about the 21m section to see how the treaty system was implemented in the Pacific North West and the conditions that were negotiated. The theme of this session I think was around social equality and outcomes. It does seem that the treaty conditions have not saved the fishery from the impact of Climate change and as income from wild salmon has fallen dramatically this has affected the conditions of the indigenous that rely on fish.

Enforcement and observer programs: An essential partnership to protect observers, maintain high-quality data, combat IUU, and ensure sustainable fisheries management

This session highlighted the essential relationship between fisheries observer programs and enforcement in order to foster the support of observers and ultimately sustainable management of our marine resources. Although observers are central to high-quality fishery-dependent data collection, observers also face challenges in performing their work safely at sea on commercial fishing vessels. Without effective enforcement programs, regulations and measures designed to the rules that are in place to create a safe and efficient sampling

environment for observers are easily subverted. Enforcement also is paramount to combating illegal, unreported, and unregulated fisheries. The expert panel discussion provided an opportunity to share ideas, present case studies of collaborative partnerships with observer programs and enforcement agencies, and illustrate operational challenges. The end goal will be to identify tactics and strategies that contribute to effective observer and enforcement relationships.

The statistics of observer deaths, assaults and sexual violence around the world was shocking and really emphasised how dangerous the job is for some fisheries.

Plastic Contamination: Inputs from Fisheries and Occurrence in Decapods in Western Australia

Katrina Bornt

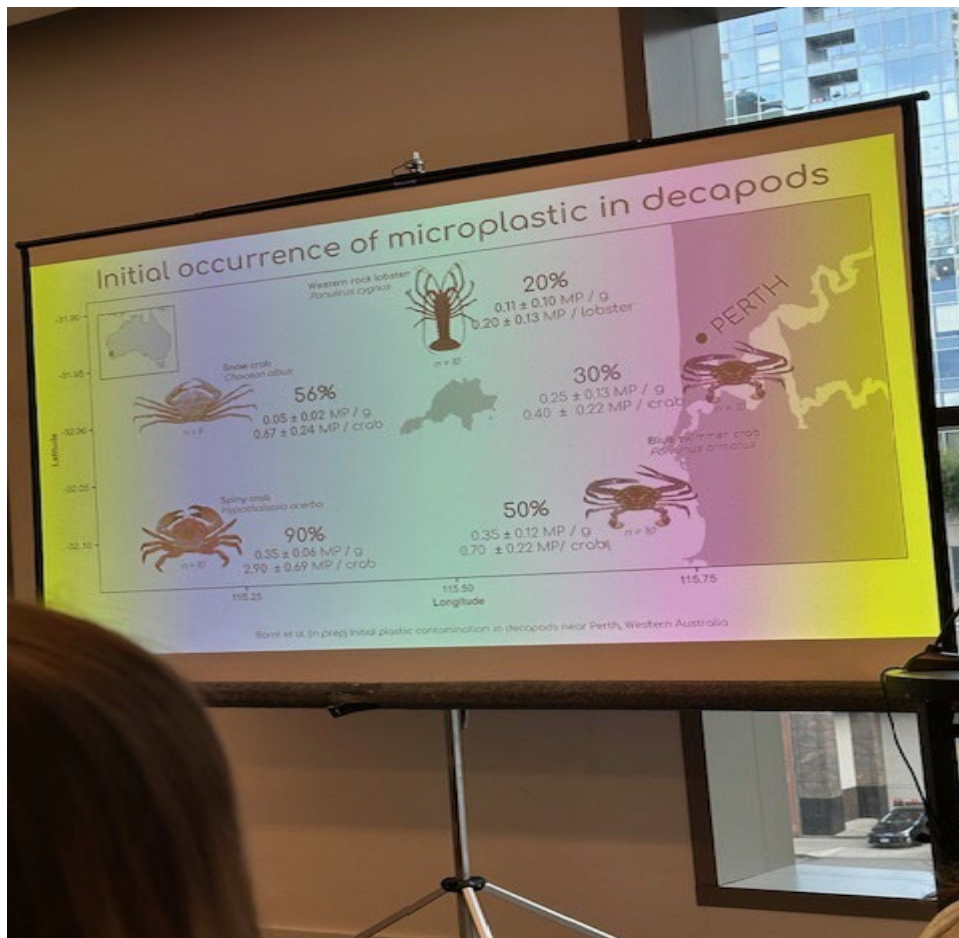
The University of Western Australia

Plastic contamination in the marine environment that arises from fishing gear and other sources can shed microplastics (< 5 mm) and infiltrate lower trophic level species, bioaccumulate in food webs and culminate in humans that consume contaminated seafood. However, there is limited understanding of plastic contributed by fisheries and plastic contamination in commercially significant marine biota in Western Australia (WA).

This study assessed plastic inputs from fisheries into marine environments and plastic contamination in decapods near Perth, WA. In the first stage, the use and loss of plastic fishing gear by the iconic West Coast Rock Lobster Managed Fishery in WA was estimated from fisher interviews in 2021, and supplemented with fishery-dependent statistics and beach litter surveys. A cost-benefit analysis that assessed and recommended viable options for mitigating plastic gear use and loss from this fishery whilst maintaining feasibility for commercial fishers was also completed.

In the second stage, microplastic contamination in gastrointestinal tracts and plastic related chemicals (e.g. phthalates and bisphenols) in muscle tissue were assessed in commercially targeted species of decapods in WA. These species of decapods were all wild caught in their different depth ranges near Perth, WA in 2022 and included: western rock lobster (*Panulirus cygnus*), crystal crab (*Chaceon albus*), champagne crab (*Hypothalassia acerba*) and blue swimmer crab (*Portunus armatus*).

This was a fascinating study off the WA coast that showed higher microplastics in snow crabs in 400m than crabs in the Swan River or Rock lobster from Rottnest island.



Challenges Managing a Multi-Species Recreational Fishery to An Explicit Catch Allocation

Gary Jackson

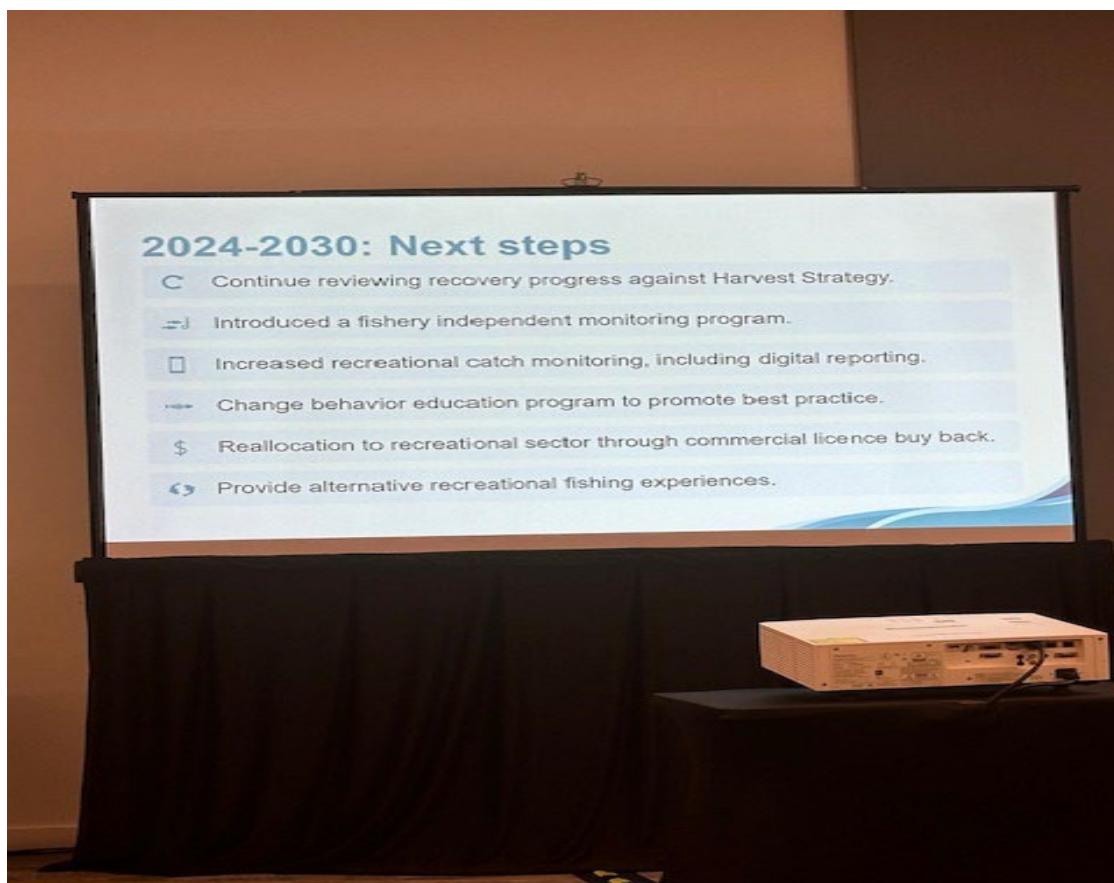
The Department of Primary Industry an regional Development - WA

The adoption of formal catch allocations between recreational and commercial fishing sectors seeks to improve ecological sustainability outcomes and maximise the social and economic flow of benefits of fishing to the community. Sectoral catch allocations for the multi-species West Coast Demersal Scalefish Resource in Western Australia were established in 2012. Catch shares were allocated to the commercial (64%) and recreational (36%) sectors and sectoral allocation guidelines were also established for key species. This resource includes over 100 species across a large spatial area, with catches dominated by West Australian dhufish (*Glaucosoma hebraicum*), pink snapper (*Chrysophrys auratus*) and baldchin groper (*Choerodon rubescens*). We present a synthesis of the development and implementation of the management review processes for of the resource over the last 20 years and outline future directions. Firstly, the initial stock assessment in 2007 identified reductions in catch of at least 50% were required to allow stock recovery and significant management intervention was implemented to initiate a 20 year recovery plan. Secondly, management strategies expanded from catch-objectives to include ecological, social and

economic objectives within a formal Harvest Strategy developed for the first time in mid-2021. Thirdly, a stock assessment in late 2021 identified recovery was slower than anticipated and management intervention was required to achieve a further 50% reduction in catch limits. This synthesis highlights the importance and challenges of monitoring sectoral catch, credible scientific data, formal allocation processes, robust co-management and flexible management arrangements to manage the recreational sector to their allocation.

This was a very biased presentation by DPIRD showing decades of mismanagement on the west coast bioregion. Very little data collection up until 2021 and still no program going forward to improve on this apart from the final slide which indicates clear WAG policy of removal of Commercials and reallocating to recreational. If this is policy, then it is not public.

I would actually refer to Recreational fishing in Australia (and other parts of the world) as clearly in the **IUU** category.



Battling ghost fishing: ecosystem impacts, policy and search and retrieval

Derelict fishing gear is a global problem, damaging marine ecosystems via habitat degradation and killing marine life, negatively impacting fisheries. To mitigate these issues, managers and marine stakeholders must understand the reasons for, and areas of, fishing gear loss specific to their region. We conducted a global review of reasons for commercial gear loss, using the findings to design a survey focused on coastal British Columbia (BC), Canada as a case study.

We conducted dockside and on-line surveys of commercial fishers to record their experiences with lost gear across the categories of nets, lines, and traps. Additionally, we used regression analysis to create a species distribution model of lost fishing gear in BC based on prior observations of lost gear and their associated environmental variables. The global review highlighted that the most common reasons for gear loss were interactions with other fishing vessels and their gear, marine weather, and snagging on submerged features. Survey results indicated that snagging gear on rough substrate was the most important reason for loss across all gear categories. Fishers indicated that Hecate Strait, Clayoquot Sound, and the Strait of Georgia were common areas for gear loss. We found that the model results generally reflected those from the global review and fisher survey, with some differences. The model indicated that bathymetry, fishing effort, and wind speed were important gear loss factors. The areas with the highest probability of lost gear occurrence predicted by the model were similar to those indicated by fisher survey. Differences between the fisher survey and the model may be due to spatial scale, which may have management implications. By increasing our understanding of why and where commercial fishing gear becomes lost in coastal BC, we hope to support decisions to prevent gear loss and remove derelict gear. Lots of work in this space being done in nearshore fisheries with decades of gear on the bottom. There are some good methods being developed but critical to any gear is the development of cathodic or sacrificial panels to stop ghost fishing. AIS transponders are also pending approval for use on gear. This could be a cheaper way of marking floats to stop vessels running over when in transit.

There are some good camera models being used that could help in the Northern Trap Fisheries, and they are using these rather than ROV's. The work has multiple partners across agencies and NGO's. This might be what we need to get a longer term program in place for ghost gear and gear recovery practices.



There is multiple technology available for tracking GG or locating ALDFG (Abandoned, lost or discarded fishing gear) and these include RFID on traps, Active RFID on floats (drone systems), Smart Buoys, AIS Fishing gear(not yet approved, but available).

<https://www.resqunit.com/> - Self surfacing unit on trap.

<https://www.notus.ca/gearfinder-700>. Transponder unit for locating traps.

<https://equalsea.eu/net-tag-2019-2021/>

Day 3

Plenary Session 2 - Food & Nutrition

Description [Please use this link to access a live stream of the Plenary.](#)

Scroll to the 1.40.00 mark for Vera.and 02.42.00 for Shakuntala.

Vera Agostini

Deputy Director, Fisheries and Aquaculture Division at the UN Food and Agriculture Organization (FAO)

Vera Agostini, Ph.D. is the Deputy Director of the Fisheries and Aquaculture Division at the United Nations, Food and Agriculture Organization (FAO) where she provides oversight, strategic leadership and technical support. From 2007-2017 Vera was with The Nature Conservancy, initially as Senior Scientist with the Global Oceans Team, and then as Director of Conservation and Director of Climate Adaptation. Dr. Agostini is a fisheries scientist by training, who has held positions across three sectors (non-governmental, government, and academia/educational) providing technical and strategic leadership across a range of multi-disciplinary efforts around the globe. Her experience ranges from comprehensive ecosystem research to broad policy and planning. She has provided technical and strategic leadership across a range of multi-disciplinary efforts and worked with coastal communities and artisanal fishers around the globe. Areas of focus include biodiversity mainstreaming in the fisheries sector, marine spatial planning and protected area network design, ecosystem based climate adaptation and disaster risk management, ecosystem approaches to fisheries, ecosystem services in pelagic environments, social resilience and small scale fisheries.

Shakuntala Thilsted

Director for Nutrition, Health and Food Security Impact Area Platform, CGIAR

Shakuntala Haraksingh Thilsted is the CGIAR Director for Nutrition, Health and Food Security Impact Area Platform. She was previously the Global Lead for Nutrition and Public Health at WorldFish. She was awarded the 2021 World Food Prize for her ground-breaking research, critical insights, and landmark innovations in developing holistic, nutrition-sensitive approaches to aquatic food systems. She was awarded the 2021 Arrell Global Food Innovation Award for research innovation. She is the chair of the Scientific Advisory Committee (SAC) of the UN Food Systems Coordination Hub.

This was in my view the best session of the conference and really highlighted the task ahead to feed the population. With Africa's population increasing at an astounding rate there is forecast to be 42% of the worlds population in poverty by 2050. We have the ability and the need to double production from the Ocean to meet our obligations for the future. We are not utilising our resources in a sustainable manner.

Interestingly and disturbingly, The United Nations Food Systems summit in 2021 made NO reference to food available from the aquatic space. Strange.

I met Paul Lansbergen, who is the President of the Canadian Fisheries Association and the President of the International Committee of Fisheries Associations. Patrick made the introduction.

I thought his slide deck was a good insight on how they are tackling the same issues we are. Old boats , no value add of products and products being relegated to commodity status. The view is to modernise or become redundant.

Some points from other presentations:

Lisa Pfeiffer, National Marine Fisheries Service

She presented on the “Development of Spatial Data to Support Ecosystem Management initiatives and Economic Impact Analyses”. See [fishSET](#) for more details.

Kelly Andrews, NOAA Fisheries

He presented on “Representing Fisheries’ footprints in Offshore Wind Energy Planning”. He highlighted [spatial suitability modeling](#) that the US Bureau of Ocean Energy Management (BOEM) does. It creates a suitability score for where to place offshore wind.

Kelly also presented on “Framing dynamic interactions between offshore wind energy development and commercial fisheries”. This started to incorporate climate change dynamics. Here is a link to a paper I found online – [NOAA, March 2023](#).

These presentations talked about the geographic displacement of fisheries as a result of the offshore wind farms. They did not go into the ecosystem impacts of the wind turbines on fish habitat and/or stocks.

Ray Hilborn has some new unpublished research on how various countries are performing against their seafood production potential. It is a function of conservative (or not) approaches to setting TAC/quota; stock rebuilding efforts; and actual harvest levels. Not surprising, Iceland was top of the pack, producing at their full potential. Canada and the US are middle of the pack while other countries I can’t remember were much lower – like less than half of their potential. I would like to see this when it is published. Ray did not indicate when.

Ray also presented at a session on bottom trawling and he compared the environmental impacts of bottom trawling to other forms of food production. His main point was that all methods of food production have environmental impacts. Let’s not forget that farming is monoculture with no biodiversity to contaminate the crops. It was a good contrast to some of the other presenters that are biased against fisheries and bottom trawling.

There was a student who presented his research on whether the US could be self-reliant in seafood production. He categorized the requirements along existing breakdown of production and consumption of seafood product groupings (fish, shellfish, molluscs, etc). He also broke it down by region of the country. Upshot is that it is possible but it would require some shifts in consumption behaviour and an increase in processing capacity and other infrastructure. I thought it was interesting. It is not yet published.

I didn’t take notes of the presentations that were biased against the sector. I thought most of them were similar to what I have seen previously.

Wind farms and Climate change were also front of mind.

The overriding talking points the 5 days was

- Reduce fishing, reduce impact, move fisheries back to artisanal/non industrial status to deliver social equality- Social engineering type of stuff and ignoring SDG14 (that did not get much of a run!)
- World poverty and hunger is at crisis point and we must produce more food (although not from wild catch fisheries)
- Climate change was real but it seems no one except Beth Fulton was making any progress on it in a meaningful way. The US and European modelling on species shift were not as good as what AFMA and Beth have done. The issue around Marine conservation areas was contentious with many taking the view that Oceans needed to be protected by vast areas of Marine parks (I am guessing so they can continue to study fish and not necessarily productive fisheries.)
- Food security was spoken about by a number of presenters BUT they were not lauded at all. The US student referred to below (in yellow) made a case for world turmoil and the US stopping all imports due to various security concerns. His presentation showed that the US could sustainably ramp up production in US Fisheries and maintain them at a sustainable level by moving to a non-waste model for all product landed. This would also feed into a circular economy for waste products. Although Australia is not as productive as many other country's, this should be something we should be aware of.
- It was accepted that systems are morphing quickly due to climate and the scientific community were struggling to keep models updated. I do believe that by using more industry knowledge and getting data systems amalgamated across fisheries, there would be a better picture of the changes that are happening. 80% of the worlds fisheries are data poor.
- Of note was the attendees at the conference were 60% female, 38% male and 2% non- gender specific (like the Electronic cigarette in the Qantas add- *Whatever that is..?*)
- Academics 55%, Government 20%, NGO's 15%, Private sector 7%, Indigenous 3% .

Boston Seafood Show March 10-12th.

I visited the Boston show and so did about 25,000 other seafood folk. Australian and related people that were there (and I am sure that I missed a lot) were

- Malcolm and Alice from ALPL
- Peter Thomson and Janet from Argos
- David Ellis (tuna Australia) and Ilse Keesling from CSIRO/Oceans
- Sophie Sharland (Johns Daughter who was at Yale for a week doing her MBA)- Impressive young lady
- Greg Hart
- Paul Lansbergen who is the President of the International Council of Fisheries Associations and also President of the Canadian association.
- Marcos Andrade (ex Pescanova)

I met the Mark Foods guys Barry, Sam B, JB and others. They put on a great stand and one of the few that don't have a chef there but very well attended and displays of all of Austral

Fisheries products. The visuals of the Australian prawn and long line fleet were crisp and really prominent. I only saw one other bit of toothfish at a Taiwanese stand (a small 2kg trunk).

The show was well represented with

- Salmon in all forms from fillets, portions, value add, smoked, souped, deli packs, lunch tins etc.
- Wild caught Shrimp in all forms 3kgs head on/off and smaller packs down to 500gm.
- Farmed – crumbed, crumbed with cheese, crumbed with chilli/creole etc flavours.
- Farmed – soups, chowders, meat- tail on/off prawn cakes etc.
- Blue Fin Tuna- some fantastically visual stands of tuna that seemed well populated
- Pollock- Fried, crumbed Pollock and haddock everywhere. Trident the most prominent.
- Crabs and Lobster- LOTS

There was a large Ecuadorian stand that gave some type of idea how big that country's production really is. Heading for 1m tonnes per annum of shrimp.

There was a 40ft self contained prawn farm in a container. 20,000L and 1T of free swimming white prawn.. Impressive tech.

I attended a Plenary on the Economics of Populism that broke down the Biden – Trump contest. The election is viewed as really the only globally significant event this year.(go figure) If Trump wins then that is the end of the IRA as it threatens key business models all across the red belt of the US. They are the states that pump oil and gas. Interestingly, the major investment areas of the IRA are these key states. The strategy behind this is to pour money into green energy in O&G states, creating jobs that rely on green energy funding and therefore democratic votes. The cost of living has risen 38% in the US since Biden was voted in and is unlikely to fall if Trump wins with his stance on tariffs. Inflation will stay high and global trade turbulence will return. Labour markets are tight in the US and will tighten further if Trump wins.(close the border and arrest all the illegals). The GOP states are responsible for food, fuel, fertilizer, farms and hydrocarbons- in short Carbon. The Democrat states and responsible mainly for finance , Insurance, real estate, software, Govt services, movies, tech and biotech

You get where this is leading- Democrats –

- Decarbonisation is good business,
- GOP oil and the use of it is critical to their business model.

This is an election about asset classes,

If the Democrats win

- IRA 2,3 and maybe 4
- Carbon assets get stranded in the US

If the GOP wins

- IRA remains but the “ administrative state” is dismantled under Executive order project 2025 Schedule F. This means that all senior Govt workers in the IRA become “ hire and fire” rather than public servants . The IRA executive will be gutted so any further decisions around a decarbonisation program will be stalled.
- Existing Carbon subsidies remain (most go to large O&G producers now) so they can continue to earn revenues from fossil fuels while offsetting through solar, wind etc. The Business model remains intact

ESG

- Southern states Attorney Generals have banned state pension funds from ESG investments.
- Florida, Oklahoma and Alabama divest from Blackrock over ESG.
- Over 20 GOP states have bills in parliament to ban ESG.
- Why- Back to core GOP states have carbon business models.

COOL

There was a session on COOL that has been in place in the US since 2006.

It is managed by the USDA, NOAA and the FDA who all have responsibility for some part of the audit trail The FDA is responsible for compliance and this stops at the retail level. They have decided that trying to enforce COOL labelling at a restaurant level is impossible to manage at all.

This is a stark reminder of the task that we have to navigate at an Australian level in 2025.

There was a number of modern slavery and workforce NGO's in the room including PEW who are taking a Global lead on workforce conditions. We need to be mindful of this position from PEW.

Electric and Hybrid Expo , Long Beach, March 13-14th 2024.

The Expo was attended by about 500 people and also the other bursary recipients for Australia, Mike O' Brien, Adam Radford, Jayden Pittorino, Matthew Whittle , Matthew Ottersen and Prue Davies.

Day 1

The Plenary speaker was Ben Gully (ex BV and now with Lloyds)

His presentation was on the evolution of battery's and the types that would be used in the future.

- Battery manufacture was becoming cheaper by the month and was rivalling solar panels in production capacity.
- Large banks of storage battery's were being made for commercial use around the world and they are being applied to support fast charge systems for Marine infrastructure. (ferry's and harbour transport)
- Corvus is still the leader in Marine battery applications with the development of their Dolphin NxtGen system
- Battery management systems are the technical growth area and are the major part of any battery system that is load sharing or shaving.
- The stark reality is that the Maritime market is tiny compared to road and terrestrial freight. The fast moving solutions for battery development are for subsidized operations in European countries.
- Waste heat from batteries is being used in more applications in colder climates as replacement for HVAC system.
- There are battery systems available now to run a 15m fishing vessel for 8-10 hours but the weight of the batteries make it an unlikely option.

Hybrid systems seemed to be the focus of a lot of the discussions, with lots of commentary around " its easy to build a bad hybrid system"

- Hybrid systems are now becoming a whole of vessel solution from systems design and integration from multiple designers working together. Operational mapping was seen as the starting point.
- Retro fitted systems were seen as difficult to design and install with cost and compromise being significant factors.
- The genset was seen as the most critical piece in the hybrid puzzle with operational mapping as a primary concern to design load sharing/shaving profiles.
- Gensets need to be " right sized" and matched to a battery management system to optimise power rather than battery storage.
- Technical solutions are available but for Australia's DCV fleet, this brings into focus the skills and expertise needed to run these vessels.

With European regulations very stringent on emissions, it calls into question the emissions standard that maritime will be held to in its DCV fleet. I would hazard a guess that most propulsion and genset engines are Tier 1 or Tier 11 at best within the fleet.

Tier 4 is now being used at the next standard for Europe. If we are to meet this on equal footing then there is a massive gap between standards. Given the Governments recent release on emission standards in vehicle, one would think that maritime will not be far behind.

Building a hybrid vessel.

- Cost barriers and performance needs are too high to build a fully electric vessel in the US (and Australia) without Government assistance.
- Cost benefit analysis does not support a new build electric vessel of any size. In the US, it is cheaper to run gensets to charge vessel batteries than take power off the grid (go figure that as a emission reduction pathway)
- Reliance on diesel engines is still very prominent and will be for the near future. Diesel is about US\$1 per litre. (AUD1.52)

E1 Marine- Kyle Taylor

This is the RIX group (designer, vessel builder and fuel systems engineering partnership)

<https://www.e1marine.com/>

- The Hydro 1 push tug is starting construction next month. 25m x 2000bhp.
- E1 Marine is the commercial manager for the Methanol- Hydrogen generation system.
- Basic function of the Hydrogen generator is to create hydrogen from deionised water and methanol using steam reforming processes.
- System design is either modular or whole of system design including vessel.
- Cost of vessel is circa USD10m.
- Training package needed for dealing with methanol, Best operating practice already constructed and 5 year maintenance period on fuel cells.
- The modular concept is appealing for a proof on concept if the vessel can have the equipment and fuel deck mounted.

There was little on alternative fuels but methanol was firming as the fuel of choice to use as dual fuel or to power hydrogen fuel cells. Hydrogen injection was seen as a trial able option, although Matt Whittle from Huon said they have trailed it with a smaller reduction in fuel burn than expected (2%) .They did not seek AMSA approvals nor did they measure emissions. Huon are very proactive in this space and are directing a lot of budgeted resources (and BECRC money) in this direction.

I think it is worth trialling a hydrogen system on a dyno to see what it does.

Outboards were present but once again, a 150hp OB needs a 650kg battery to run it for 4 hours. They are just not practical apart for short runs on a farm barge type vessel.

All in all, the European Electric and Hybrid Expo was much larger and more informative across a broader range of options than the US show. Of note was the change in conversation from a single solution to a hybrid as the transition.

It is still moving very fast.

Summary

I believe the value that bursary recipients received from attending the Electric and Hybrid Expo was valuable in a number of ways. The networking opportunity for the younger members was valuable as they all shared experiences and were a little removed from what was happening on a global stage for alternative sources of propulsion and energy. The balance of a couple of older heads like Mike and myself balanced out” what needs to be done / what can be done” across various industry applications.

I note that the US Expo was of a much smaller size than the European Expo and did not have the displays and working models available to interact with. There is no doubt that a visit to the European Expo for Seafood industry participants would be very valuable. This should be targeted at those parts of industry than could not attend the US forum due to season dates. (ie Trawl)

The participation of Dr Jennifer Marshall gave those attending a link into the FRDC executive and the relationship will be further strengthen by her attendance and interaction with the team.

Clayton Nelson

Austral Fisheries Pty Ltd.