

# Torres Strait Scientific Advisory Committee Meeting 80

Meeting Record  
30 November – 1 December 2021  
Videoconference and JCU conference  
room Thursday Island

Note all meeting papers and records are available  
on the PZJA webpage: [www.pzja.gov.au](http://www.pzja.gov.au)



Australian Government

Australian Fisheries Management Authority

# 1 Meeting Administration

## 1.1 Acknowledgement of Traditional Owners, welcome and apologies

1. The 80<sup>th</sup> meeting of the Torres Strait Scientific Advisory Committee (TSSAC) was opened at 930am AEST, on Tuesday 30 November 2021.
2. Attendees were welcomed by the Chair who acknowledged the traditional owners of the land on which all participants were on, and paid respect to elders past, present and emerging.
3. A prayer was offered by Mr Rocky Stephen.
4. Apologies were received from Mr Gavin Mosby (industry member), Mr Mark Anderson (TSRA member), and Ms Michelle Winning (Queensland Fisheries member).

## 1.2 Adoption of agenda

5. The agenda (Attachment A) was adopted as circulated by AFMA. The TSSAC also acknowledged that the FRDC would be attending the meeting on day two, to hear about the climate change and non-commercial catch monitoring projects.

## 1.3 Declarations of Interest

6. The Chair advised members and observers, that as provided in PZJA Fisheries Management Paper No. 1 (FMP1), all members of the TSSAC must declare all real or potential conflicts of interest in related to Torres Strait research, most specifically the agenda items being considered in the current meeting. It was noted that where a direct conflict of interest is determined to exist, the TSSAC may allow the member to continue to participate in the discussions relating to the matter but may also determine that, having made their contribution to the discussions, the member should retire from the meeting for the remainder of the discussions on that issue.
7. Each TSSAC member updated their interests lists, and roles held that may pose conflicts (as documented in **Table 1** below).
8. No declarations were reported for any members against any specific agenda items.

**Table 1.** Declarations of interest for members and observers against. Each member includes a list of their positions and associations which have potential to create a conflict of interest. A note is also included as to whether each member has any specific conflict related to the TSSAC 79 agenda.

Name	Position	Declaration of interest
Mr Ian Cartwright	Chair	Fisheries consultant. Member of QLD sustainable fisheries expert panel. No specific conflicts against this agenda.
Ms Selina Stoute	AFMA Representative	Senior Manager Torres Strait Fisheries, AFMA. No specific conflicts against this agenda.

Name	Position	Declaration of interest
Ms. Lisa Cocking	Executive Officer (AFMA)	Senior Management Officer AFMA. EO of TSPMAC. No specific conflicts against this agenda.
Dr Roland Pitcher	Scientific Member	Fisheries Scientist, CSIRO. Some CSIRO projects are held by researchers in same office. See section 1.2 of meeting record for the TSSAC decision on managing this perceived possible conflict against this agenda during discussions.
Dr Dirk Welsford	Scientific Member	Research scientist at Australian Antarctic Division. Sub-Antarctic resource assessment group. No specific conflicts against this agenda.
A/Prof Natasha Stacey	Scientific Member	Researcher at Charles Darwin University. Past (early 2020) FRDC NT Research Advisory Committee member. Not involved in any Torres Strait related projects currently, however was a member of the advisory committee for the non-commercial catch project. No specific conflicts against this agenda.
Dr Steve Newman	Scientific Members	Fisheries Scientist at Department of Primary Industries and Regional Development (WA). No specific conflicts against this agenda.
Mr Keith Brightman	TSRA Member	The TSRA hold in trust, on behalf of Traditional Inhabitants, sunset licences for the Finfish Fishery, and hold licences in the TRL and BDM fisheries. No specific conflicts against this agenda.
Mr Rocky Stephen	Traditional Inhabitant Industry member	Kemer Kemer Meriam member. TSIRC Councillor for Ugar. President of Kos and Abob Ugar fishers association. Finfish working group member and Finfish RAG member. Partnership in fisheries business. TSRA member for Ugar. Member Zenadth Kes Fisheries Limited. Was a part of the project steering committee for the non-commercial catch project. No specific conflicts against this agenda.
Mr Patrick Mills	Traditional Inhabitant Industry member	Member of the Torres Strait Fishers Association. TIB fisher. TRL Working Group industry member. No specific conflicts against this agenda.
Mr Maluwap Nona	Traditional Inhabitant Industry member	Chair of Malu Lamar, TIB licence holder (all entries), HCWG member. Chair of Maluilgal PBC, Badu Ar Mua Migi Lagal PBC.

Name	Position	Declaration of interest
Mr Yen Loban	Fisheries Portfolio member TSRA	TIB licence holder, director Zenadth Kes Fisheries. No specific conflicts against this agenda.
<b>Observers</b>		
Dr Leo Dutra	CSIRO consultant	Attending for agenda item 2 only on day 1 and 2.
Mr Josh Fielding	Invited guest observer. FRDC	Attended for agenda item 2 on day 2.
Mr Crispian Ashby	Invited guest observer. FRDC	Attended for agenda item 2 on day 2.
Mr Ryan Murphy	Invited guest observer. AFMA research manager	Attended for agenda item 2 on day 2.
Mr Brett McCallum	Invited guest observer. ARC Chair, AFMA commissioner.	Attended for agenda item 2 on day 2.

## 1.4 TSSAC 79 meeting record and action items from past meetings

9. The TSSAC noted the ratified TSSAC 79 meeting record, distributed to members on 2 August 2021.
10. The TSSAC noted progress against actions arising from past meetings. They discussed action item 79.4 (seeking advice from the Finfish RAG on the close kin mark recapture project). The committee noted that the project is now underway, and the project team will have a report early next year on genetic connectivity of Spanish mackerel throughout the region.
11. The committee discussed the possible benefits the project could have, particularly to the traditional sector. The project has two main benefits; i) to understand if fish in a certain area of the fishery, or different fisheries (gulf or east coast) are mixing with fish in other areas, and ii) to explore another method to estimate the number of fish in the water, which will improve the stock assessment. This will help Traditional Owners provide advice on how many fish should be caught.
12. The TSSAC Chair noted that the process for approving this project was robust, where the Finfish RAG identified the project as a priority. The TSSAC considered the proposal and sought further advice from the Finfish RAG regarding a few possible issues with the project. The concerns were then addressed by the Finfish RAG and provided back to the TSSAC for consideration before the project received final approval.

13. The Chair provided an update against action item 79.5, to speak to the AFMA CEO about TSSAC funding. The Chair noted that AFMA has its own budget constraints and the first step will be seeing whether funding can be secured from FRDC or other research supporters. If these efforts are unsuccessful, the Chair is happy to approach AFMA again. The Chair again noted the importance of securing enough regular funding to ensure the TSSAC have sufficient information to ensure sustainable management of the Torres Strait stocks.

## **2 Research priorities for broad Torres Strait Research**

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14. The TSSAC noted the background and main outcomes of the two scoping projects, “*Scoping a future project to address impacts from climate variability and change on key Torres Strait Fisheries*” and “*Developing an approach for measuring non-commercial fishing in Torres Strait in order to improve fisheries management and promote sustainable livelihood*”, which were discussed at TSSAC 79.
15. The TSSAC also noted the discussion and recommendations from meeting 79, where both projects were considered a priority for funding for as soon as possible. Both priorities are important to Traditional Inhabitants as well as Torres Strait fisheries management generally.
16. The TSSAC noted funding beyond the TSSAC would likely be required due to the scale of these two projects. They also noted the need to ensure the TSSAC are clear on their recommendations on moving forward with these two projects, for the FRDC presentation tomorrow.

### **Scoping a future project to address impacts from climate variability and change on key Torres Strait Fisheries**

17. The TSSAC discussed the project “*Scoping a future project to address impacts from climate variability and change on key Torres Strait Fisheries*”. Dr Leo Dutra, CSIRO, joined the meeting to answer questions relating to the scoping project and recommendations for future work. The following major points were noted and discussed over two sessions during the day:
  - a. There has been relatively little investment in quantitative modelling work on climate change impacts in the Torres Strait, which tries to identify direct effects of climate change on the species and environment in the region.
  - b. The objectives of the scoping project were to identify what is already known about climate change in the Torres Strait, and then scope out the requirements and costs of a quantitative modelling framework. Four components for a future project were identified:
    - Component 1 - Development of the over-arching data framework.
    - Component 2 - Development of an integrated modelling framework: Combine existing data and models (TRL, BDM, and dugongs) into an integrated spatial MICE model.

- Component 3 - Development of a regional hydrodynamic modelling platform.
  - Component 4 - Monitoring program to collect physical data (e.g. temperature, salinity, currents, surface elevation): 1 x 2 month deployment in both the wet and dry seasons for 2 separate years if possible.
- c. There is existing data (some global climate data, as well as BDM, TRL and Dugong data) already available, which will be fed into the data and modelling framework right away (components 1 and 2). As more data is collected, it will continue to be fed into the model, and be used to further develop the model.
  - d. The TSSAC noted the Finfish RAG advice; in which they supported the four components of this project moving forward, however collection of physical data is the highest priority for them, as they are trying to identify environmental drivers that effect recruitment of finfish. The data collected in the climate project may overlap with this other priority research.
  - e. The TSSAC also noted that the model that would be developed through this project, would be transferrable in some capacity to other fisheries, as a framework.
  - f. The TSSAC noted advice from the representative from Malu Lamar, that it is important for copyright requirements to be considered, to ensure appropriate partnerships are explored and established with Traditional Owners on all research. The TSSAC also noted that most research in the Torres Strait does not tend to result in any commercial products that would have profits tied to them in the future, and require copyright considerations.
  - g. AFMA noted that this issue was raised at the Hand Collectables RAG meeting in October this year. An action from that meeting was for Malu Lamar to seek assistance from the TSRA, together with legal advice, on how to manage intellectual property of Traditional Owners, and provide the outcomes to AFMA. AFMA suggested this continue to be progressed out of session, and that AFMA could also share the research contract template with Malu Lamar and the TSSAC, so some time can be spent understanding Malu Lamar's needs and how these can be considered and managed.

**ACTION:** TSRA to organise meeting with Malu Lamar and AFMA to discuss copyright considerations for Torres Strait research, to ensure proper partnerships and copyright management relating to any Traditional Ecological Knowledge and data ownership. Once preliminary discussions and work are completed, the TSSAC should be presented with options for managing research data and copywrite, including a copy of the standard TSSAC research contract template for consideration.

- h. The TSSAC noted that the additional data that would be collected during component four of the Climate change modelling project includes currents, depth temperature for tides, as well as circulation data (which is the minimum data needed for a hydrodynamic model). The estimated costs (\$160k per year) include data collection (including two boat trips per year) and cleaning

and management of the data. Dr Dutra said it may also be possible to collect some data during TRL surveys.

- i. In regards to the staging and budgeting of the different components of the project, the TSSAC noted that the project budget can be spread across several years if needed. In this case, components 1 and 2 should be completed together over the first two years of the project (around \$580k), then 1-2 years of additional data collection (around \$160k per year for 2 years) is required for development of the hydrodynamic model (around \$350k).
  - j. The TSSAC noted that some initial advice would be able to be provided after the first two years (components 1 and 2) are completed. This would allow the PZJA and communities to discuss some of the issues and preliminary results that could start informing adaptation strategies based on changes to seagrass and similar. However the hydrodynamic model will provide more detailed results based on localised temperatures for specific areas, and how this may effect the different stocks and fisheries based on larvae movement and recruitment.
  - k. The TSSAC noted that Torres Strait communities feel there is a real need to identify climate change risks as soon as possible, given preliminary predictions indicated there may be significant changes in even 5-10 years in the Torres Strait. Clear predictions will allow communities to make decisions about how they will cope with changes (e.g. to fish moving), both for their kai kai, and commercial fishers. There is concern that waiting five years for results, if the project takes that long, may be too late.
  - l. The TSSAC agreed that their preference is to start, and complete this project as soon as possible, meaning if funding can be secured, components 1, 2 and 4 should be completed simultaneously, allowing earlier development of the hydrodynamic model, and completion of the project in around 3 years instead of 5 with a staged funding approach.
18. The TSSAC discussed several other matters relating to this project:
- a. The TSSAC noted that it would be desirable to have specific actionable outcomes at the end of this project (e.g. a recommendation to move a freezer from one island to another based on fish no longer being there). At the same time, the TSSAC acknowledged that fine scale recommendations such as this don't tend to come out of climate change models. The agreed the project scope could ask researchers to clarify whether this level of detail will be provided or not.
  - b. If possible, the model should provide estimates of the economic, social and other fisheries-related livelihood impacts of climate change on communities in the short (2 yrs), medium (5 yrs) and longer term (10+ yrs).
  - c. The TSSAC noted that a number of data frameworks already exist (such as eREEFs) that could be used as a guide in developing this climate model, however some advice has been that adapting these existing models could be as much work as developing a new framework. All options could be considered if this project goes ahead.

## Developing an approach for measuring non-commercial fishing in Torres Strait in order to improve fisheries management and promote sustainable livelihood

19. The TSSAC discussed the project “*Developing an approach for measuring non-commercial fishing in Torres Strait in order to improve fisheries management and promote sustainable livelihood*”.
20. The TSSAC noted that the recommendations from the scoping project included a five step process for development of the data collection and storage system, and trialling and rolling out the system to communities.
21. The TSSAC noted their recommendations from meeting 79 (detailed in Attachment B to these minutes). The TSSAC supported a future project, but suggested it be carried out two stages. Steps 1 and 2 should be completed in stage 1 (and funding approved for these steps only initially), where a costing for stage 3-5 can then be determined and considered by the TSSAC.
22. The TSSAC also acknowledged that the co-development of this data collection and management system, with communities, is critical to the success of this project.
23. The following major points were noted and discussed:
  - a. The TSSAC noted that the priority for this project came about as the TSRA board Finfish quota committee identified a priority to know estimated catches outside of commercial fishery. Through knowing how much catch communities take, it allows the PZJA to set aside the appropriate amount of community catch, before setting the allowable catch for the commercial fishers. The priority was then considered by the FFRAG and other committees, and identified as a priority by the TSSAC and approved for funding the scoping project.
  - b. The TSSAC reiterated the need for broad consultation, with all Torres Strait and Northern Peninsula Area (NPA) communities, which will allow us to manage any concerns from communities regarding how and why data would be collected, and ensure communities are a part of the design process.
  - c. The TSSAC recommended that a Traditional Inhabitant member from a PZJA advisory committee be present at the workshop at each community wherever possible. The representative needs to be chosen carefully, and using FFWG members may be a good option.
  - d. The committee also noted the need to collect data on recreational fishing catch. This could be incorporated into the project scope, However AFMA advised that it may be more appropriate to get recreational catch data through working with the Queensland Government using their state recreational catch surveys, separate to this project.
  - e. The budgets estimated for this project are for staff time only (\$30-45k), and no travel. Travel and proper engagement could add \$45-65k on top of the first two steps of the proposal, based on other consultation that has been undertaken. This could be even higher if the consultation is even broader, as suggested.
  - f. The TSSAC agreed that a scope did not need to be drafted for this project for tomorrow's discussion with FRDC, as the presentation by Traditional



Inhabitant members of the TSSAC, and AFMA will provide sufficient information on this project.

### 3 2022-23 Budget and Research Priorities

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24. The TSSAC considered 2022-23 the Torres Strait research priorities and budget. The following major points were discussed:
- a. Research priorities have been identified by the RAGs and Working Groups, and 6 have been identified as priorities that should be considered for funding in 2022-23. The two projects discussed earlier in the agenda are in addition to these 6, taking the total to 9.
  - b. The estimated budget for the 6 projects identified (\$604,000) exceeds the predicted budget (around \$570 000) that will be available between AFMA and the TSRA by around \$221 000) in 2022-23. These projects are estimates only and could be significantly different to what comes through with research applications.
  - c. The budget estimates may be an underestimate, as some of the costs associated with research have greatly increased as a result of Covid. For example boat hire for another project has doubled in cost.
  - d. The TSRA contribution can be used towards any project, as with the AFMA funding.
  - e. AFMA prefer not to release project scopes beyond what will realistically be able to be funded by the TSSAC, so as not to waste time of researchers. However there may be use in releasing all of the projects in the call, to get an accurate estimate of the costs of research for the Torres Strait. This may provide more evidence for seeking more funding for Torres Strait research, which may result in unfunded (from TSSAC funds) going ahead through funding from other resources.
  - f. The TSSAC noted that it may be useful to ask the RAGs and Working Groups to prioritise the research with their consideration of the full proposals, so TSSAC can consider this when making decisions around projects at its next meeting.
  - g. The TSSAC considered whether the Curryfish conversion ratio project could be postponed, as a lower priority, particularly given there is uncertainty of whether CSIRO have capacity to continue for this project. On guidance from the Traditional Inhabitant members, the TSSAC decided it should be progressed, and could be combined with the other two BDM priorities in an attempt to achieve some savings. The combined project proposal would still need to provide costings for each project separately, in case the TSSAC do not secure sufficient funding for all three project when bundled.
  - h. The TSSAC also noted that if the black teatfish survey goes ahead, AFMA hope the sampling could be completed during the season opening in early 2022. This means AFMA will try to find funding within the existing budget to allow this work to start before 2022-23.
25. The TSSAC reviewed each of the project scopes, and **RECOMMENDED** that:
- a) The curryfish conversion ratio project remain as a priority project to pursue in 2022-23 on advice from a Traditional Inhabitant member.

- b) the three BDM scopes should be combined, to allow possible cost savings, however the scope should ask for the separate costings for the three different project elements, in case funding cannot be secure for all three parts of the project.
  - c) five scopes in total be released in the call for research in 2022-23, which includes the triple project scope for the Beche-de-mer fisheries, and the non-commercial catch project scope, noting the TSSAC will continue to pursue additional funding for this project.
  - d) the Climate change project should not be released through the TSSAC call, but left with FRDC (and the Chair and AFMA to follow up) in a hope FRDC will take a lead role in progressing this project.
  - e) a second call for research be considered for the climate project if the work with FRDC does not progress this project through other avenues.
26. The TSSAC noted the following additional points regarding the projects and funding:
- a) the white teatfish scope is the priority of the three BDM projects, if not all three can be pursued at once.
  - b) If the black teatfish project is approved, the initial industry advice is that the opening may be this financial year, which means this project would be started early.
  - c) although a number of possible funding suppliers have been identified earlier in the meeting, most of the CRCs already have funds allocated at the beginning at their implementation, and this is similar for NESP, meaning that don't tend to accept open applications.
  - d) the budget for the climate change project is quite a moderate if not minimal investment for FRDC over five years.
  - e) The TSSAC Executive Officer agreed to draft the scope for the non-commercial catch project, and send to the scientific members for feedback, before sending the whole TSSAC for consideration.
27. Industry members placed a high priority on this project as it is a high value species, and the fishery is underutilised due to gear restrictions (hookah ban), which is being discussed by the stakeholders next year. Knowing the fisheries capacity is important in understanding how to manage increased effort if changes happen to gear restrictions.
28. The committee noted concerns from one Traditional Inhabitant member around differing rules between jurisdictions for BDM fisheries, where the Queensland BDM fishery allows Hookah, as they manage the fishery with other regulations. Torres Strait Islanders would like the same benefits for fishing.

**ACTION:** TSSAC Chair and AFMA to follow up with FRDC regarding the climate change project discussions.

**ACTION:** TSSAC Executive Officer to draft non-commercial catch monitoring scope and send to TSSAC scientific members for input, before providing to the broader committee.

## 4 Historic Research Project Database

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29. The TSSAC noted the history of this agenda item. At TSSAC 73 in 2019, the committee recommended AFMA look at ways to collect a Torres Strait research database, which would include TSSAC funded, and all other Torres Strait research, to assist with avoiding research duplication and ensure data and information access. This was later refined to TSSAC funded research only, given the huge scale of the former task.
30. There are already a number of research databases, include the CSIRO Marlin database. There were also a string of projects (including the Torres Strait research repository project, completed in 2013), which collected Torres Strait research data, reports and metadata for input into the CSIRO research database. There won't be any non-CSIRO data in the CSIRO database since 2013, when the last project was completed.
31. The TSSAC **RECOMMENDED** uploading to the PZJA website, TSSAC funded research projects back to 2013, which is the time period since the other project was finalised, as detailed in the spreadsheet. This will include the project title, date of completion of the project, and the Project primary investigator's name.
32. The TSSAC noted that if at some point the TSSAC would like a separate project would need to be funded to collate a list of all Torres Strait research outside of the TSSAC, as this is beyond AFMA capacity to manage within their resources.
33. Researchers can provide a link to with their data and reports to CSIRO, for inclusion in the CSIRO database. AFMA could consider this being included within the research contract. If this happens, AFMA would need to ensure data confidentiality could be managed.

**ACTION:** AFMA to consider possibilities of adding provisions into research contracts for researchers to provide metadata (and data if confidentiality can be managed) and reports to AFMA, for inclusion in the CSIRO database.

34. The Chair closed the meeting at 430pm Queensland time, and the four TSSAC scientific members, AFMA and the TSSAC chair stayed to develop a draft scope for presentation to FRDC tomorrow, based on the discussions detailed above.

### DAY 2

35. The second day of the meeting was opened with a prayer. The Chair welcomed members back, and invited guests; Josh Fielding from FRDC, Ryan Murphy the research manager from AFMA, and Brett McCallum the AFMA Research Committee Chair and AFMA Commissioner. The TSSAC also noted that Crispian Ashby from FRDC would be joining us shortly.

## 5 Introduction to Torres Strait Fisheries and FRDC Verbal Update

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36. The Chair warmly welcomed AFMA Commissioner Brett McCallum, AFMA Research Manager Ryan Murphy and Crispian Ashby, representing the FRDC CEO Patrick Hone

37. FRDC provided a short introduction about their role in research.
38. The FRDC is a partnership between Federal Government and Fishing and Aquaculture sectors around the country. Revenue for R&D investment is based on a co-funding model between the Australian Government and the commercial fishing and aquaculture industries. Funds are collected by the Commonwealth, state and territory governments as part of their fisheries management activities. The Australian Government provides unmatched funds equivalent to 0.50 per cent of the average gross value of Australian fisheries production (AGVP). This funding is most commonly associated with 'public good' projects' Industry provide contributions via state and territory governments and the Australian Government matches this amount up to a maximum of 0.25 per cent of AGVP. This funding is associated with industry sector priorities.
39. The public good research is for projects considered to have broad community benefits beyond just the commercial fisheries, including Indigenous and Recreational sectors who don't have a mechanism for contribution to the FRDC. In the current circumstances, where Torres Strait GVP isn't included in the GVP, if Torres Strait research was supported by FRDC, it would come from this public good pool (0.5% of AGVP).
40. The TSSAC Chair questioned why the Torres Strait fisheries production value is not included in the AGVP calculation.

**ACTION:** AFMA to follow up with FRDC who agreed to look into why Torres Strait fisheries are not included in the FRDC GVP calculations, which would increase the overall pie, and how the matching industry contribution to be accessed.

41. There are also some FRDC sub committees including the Indigenous Reference Group that provide advice on opportunities for investment in research to improve opportunities for Indigenous Australians in fisheries and aquaculture. Stan Lui is the chair of that group, and there are other Aboriginal and Torres Strait Islander members from around Australia.
42. A Traditional Inhabitant member ask if there could be an opportunity for the Torres Strait region to be made a part of the voluntary contributions.
43. Ryan Murphy advised that Torres Strait fishers could make a decision to make a GVP contribution towards FRDC research, in order to be able to access this part of the funding. This is a voluntary contribution.
44. FRDC agreed to look into whether Torres Strait fisheries can contribute, or if there is some other impediment.

**ACTION:** AFMA to follow up with FRDC who agreed to look at whether there are any impediments to Torres Strait fisheries being a part of the voluntary FRDC contributions, to allow them access matching funding available from FRDC.

**ACTION:** AFMA to follow up with the FRDC who agreed to provide paperwork explaining the FRDC funding model for distribution to members.

45. The TSSAC discussed the membership of the IRG, and noted that there have been some issues with getting interest in membership. FRDC are currently looking at the operation of the IRG, and interested Traditional Inhabitant members could be dialled into that meeting if they wish.

46. The Chair Invited Selina Stoute from AFMA to provide a bit of an overview of the committee membership and representatives from Torres Strait, noting many members have multiple roles including TSRA board members, local council members and Native Title body corporate members. Most members also have long term involvement on committees and long term experience and expertise on fisheries, and understanding the cultural needs of communities.
47. Each Torres Strait Industry member provided background on their individual expertise they bring to the committees.
48. The TSSAC discussed some of the challenges associated with research funding in the Torres Strait. The following points were discussed:
  - a. The research budget in the Torres Strait has been at the same level for a long time, however the need for research is increasing, as Torres Strait fisheries continue to develop. Funding isn't even increasing in alignment with indexing, meaning funding is actually contracting not staying the same.
  - b. There are many unique complexities to management in Torres Strait and the funding the TSSAC is receiving doesn't necessarily meet that level of complexity. This means the TSSAC funding only allows some routine stock assessment work, and a bit of social science, with little to no funding available for innovative research such as climate change. This is why TSSAC are trying to determine other funding options to support Torres Strait research.
49. AFMA and Torres Strait members of the TSSAC provided a brief overview of the Torres Strait fisheries. The following points were noted:
  - a. The different fisheries are each at different stages in their development and utilisation, however there is a consistent theme, which is that Traditional Owners are at the centre of these fisheries. Traditional Owners have high aspirations to develop these fisheries and an increasing expectation that the fisheries will be managed to the same standard as other fisheries around Australia (i.e. with good evidence so Traditional Owners and PZJA Advisory Committees are empowered to provide good advice to the PZJA).
  - b. Some of the commercial species are also totem species, meaning fishing goes well beyond commercial importance, as fishing is central to cultural practices maintaining cultural connection to their way of life.
  - c. Part of progress for these fisheries, has been the development of the fisheries entity Zenadth Kes Fisheries. This body is made up of Torres Strait Islanders to help communities with fisheries business such as assisting with building and improving infrastructure on communities, marketing, training for fishers and sellers, and other fisheries related business. The Zenadth Kes Fisheries aim to support fishers to get a better value for their fisheries in the region.
  - d. There is a need to collect data on non-commercial fisheries as well as commercial, to ensure commercial and non commercial species are being protected. Improved data will allow us to ensure Traditional Owners and commercial fishers can catch the maximum sustainable catch and continue safely developing the fisheries.
  - e. Climate change is a concern to communities, as there is already preliminary advice that fish may move out of the area with rising sea temperature, which will be very problematic for communities.

- f. There has been lots of progress with fisheries in Torres Strait already, including with moving towards Traditional Owners managing fisheries, with both Finfish and the Hand Collectables fisheries having 100% ownership, and progress is being made with TRL.
- g. Catch Disposal Records are also now mandatory to ensure suitable data is collected for management. Harvest strategies have also been developed, or are being developed for all commercial fisheries.
- h. The Black Teatfish opening has been another positive step for Traditional Owners and the hand collectables fishery.

## 2 Research priorities for broad Torres Strait Research continued – FRDC Discussion

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### Climate change project

- 50. The Chair introduced the climate change project, explaining its purpose is to understand climate variability and change relevant to key resources in the Torres Strait, and the adaptation and mitigation that may be possible in some cases.
- 51. The TSSAC Chair emphasised that this project is not a researcher driven project, but is supported and very important to Torres Strait Islanders, as emphasised in their previous introductions. Torres Strait Islanders have a unique connection to the marine environment and fisheries are their only significant renewable resource. Managing the resource is essential, and being able to adapt to and mitigate change is part of this management.
- 52. The project is data driven to inform these decisions. A scoping study has already been completed under TSSAC funding, which has now provided a clear guide for moving forward with this project, and ideally gaining extra investment from other funding partners to support the project.
- 53. The committee noted that draft scope ([Attachment C](#)) and noted the desired outcomes of the project.
- 54. The Chair invited Traditional Owners to provide any additional advice on climate change in the Torres Strait. The following points were noted:
  - a. One of the key signs of climate change in the area, noticed by TRL fishers is that the rocks are turning white and TRL are becoming more scarce.
  - b. Communities need to know the possible future effects so the Traditional Owners can make decisions to adapt their fisheries. If project is supported, it will assist them to prepare for the changes.
  - c. Communities are noticing many concerning signs of climate change, including trees falling into the water and erosion, and they are worried about what will happen to them, beyond just fisheries. Other countries are moving people from sinking Islands (Fiji) to nearby mainland countries (New Zealand).
- 55. The TSSAC discussed other funding sources that may be available to support this project, noting the links to other Government Initiatives (such as the Northern Australian development fund).

56. The TSSAC noted that the following programs are around which could be tapped into for support for TSSAC projects:
- a. Northern Australian CRC are largely involved with economic development and infrastructure, at the moment the CRC are primarily looking at aquaculture, but does preclude wild capture fisheries. Collection of biophysical data links into the integrative marine observing system (IMOS), and there are a lot of resources and capital available which they may redeploy based on needs.
  - b. National Environmental Science Program (NESP) – have a specific coastal and Marine and Coastal Hub, and have an overarching Indigenous focus to their programs including a focus on Indigenous research and climate change. NESP are currently funding a small Sea Grass project in the Torres Strait. FRDC are meeting with NESP tomorrow and will discuss this project to see if anything similar is on their radar.
  - c. The Blue Economy CRC.
  - d. A bid for a new CRC for economic participation or Indigenous people ('EPIC'), which is currently being prepared, focused on supporting Indigenous organisations to develop enterprises (including fisheries) to access markets etc.
  - e. The Department of Agriculture and Water has around 100 million dollars to develop Indigenous partnership agreements across northern Australia (through Parks Australia).
  - f. The focus this proposed project has on how to integrate the outputs of any climate information into existing stock assessment models is an area AFMA are very interested in, and FRDC may be to.
57. FRDC agreed to provide some assistance with trying to put together a consortium for funding between NESP, TSRA, AFMA and possibly the FRDC.

**ACTION:** AFMA to follow up with FRDC, who agreed to discuss the climate change project with Alan Jordan from NESP in a meeting on 2 December. FRDC hope to get interest from NESP in being a part of a consortium between FRDC, NESP, TSRA and AFMA.

58. The FRDC noted that this project could be an activity that could be funded under the public good money. If a project is specifically related to commercial fisheries it can become more complex in which funding it could access. However given Torres Strait is not cost recovered (except prawn) and the beneficiaries are Torres Strait Islanders, where the benefits of this research is largely outside of the commercial fishery (subsistence and traditional use, food security, culture), it is very different to a standard climate project for regular non Torres Strait commercial fisheries.
59. If the project could be treated as a scoping project which could be applied to other fisheries around Australian in the future, it could be an avenue of interest.
60. FRDC are most interested in trying to build a consortium and also seeing if we can get contributions through the GVP gap to enable us to match those funds as well.

## Non-commercial catch monitoring project

61. Mr Rocky Stephen presented to the group on the background of this project. The following major points were noted:
- a. The project come from a need to collect information on kai kai (non-commercial) catch, to allow us to have better management of the stocks. Kai Kai catch data will allow proper allocated catch limits, and distribution between commercial and kai kai catch, noting we take traditional catch off the commercial TACs set.
  - b. There have been some trials to monitor catch in past, however the trials were not successful due to requirements for paperwork and a need for specific workers to assist with the collection.
  - c. Traditional Inhabitants are hoping this project will be more successful, by approaching it differently, including co-developing the strategies with Torres Strait Islanders. The scoping project (TSSAC project 2019/0827; *Developing an approach for measuring non-commercial fishing in Torres Straitin order to improve fisheries management and promote sustainable livelihoods*) was led by a Traditional Owner, Kenny Bedford from Debe Mekik Le Consultancy, with a team of two other scientists, and a steering committee including Traditional Owners and other scientific and social science experts.
62. The next step of the project is to do full community consultation with all communities (not just areas affected by fisheries) about the method that was proposed from the scoping project, and to further develop this project based on their needs.
63. The TSSAC Executive Officer noted the strong links between this proposed project, and the FRDC Indigenous data project [add in FRDC project number to help with identification], which had an outcome which recommended moving forward with case studies. This TS project could be a useful case study for any future FRDC supported Indigenous fisheries data project and also takes things a step further than what was explored in the FRDC project through actual methodological application as the App design will also ask Traditional Owners if there is other information they would like to collect for their personal benefit, related to non commercial species, or climate data etc.
64. This data collection tool (e.g. an App) would be owned and operated by Traditional Owners, who will co-design the system, and for this reason it also has opportunity to go well beyond the scope of commercial species data collection, as it can be an information source to support cultural maintenance and transfer for communities, so the beneficiaries goes well beyond commercial fisheries, however only if this is the desire of Traditional Owners, which some have indicated is the case.
65. FRDC noted that if this proposal is building on the previous FRDC project, they would take it to the IRG to consider, as a potential case study.
66. The FRDC noted that although the socio-economic research program of FRDC may also be interested in the project, any projects involving Indigenous fisheries would go to IRG initially, and may get human dimensions involved as well.



**ACTION:** AFMA to follow up with FRDC who agreed to talk to Chris Calogeras (the EO of the IRG) regarding the non-commercial catch project to see if they are interested to support this.

67. The Chair thanked the invited guests for attending the meeting, and took the opportunity to take Selina Stoute, for her service to the PZJA and TSSAC the last 7 years, who is leaving the team at Christmas. He noted her outstanding contribution to Torres Strait fisheries.
68. Mr Nona also gave thanks on behalf of Malu Lamar for the leadership Selina has provided to Torres Strait fisheries and communities.
69. The invited guests left the meeting. FRDC requested permission to attend future meetings, to stay connected to the work of the TSSAC.
70. The TSSAC Chair discussed the remaining agenda items. The TSSAC agreed to hold over agenda item 6.2 – the review of the procedure for undertaking research in the Torres Strait, to our next meeting, to ensure we give adequate time to discuss this important agenda item.

### **3 2022-23 Budget and Research Priorities continued**

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71. The TSSAC reviewed their discussion regarding the release of the scopes in the call for research.

### **6.2 Proposed Changes to Research Funding Timeline**

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72. The TSSAC noted that AFMA have proposed changes to the funding timeline, to bring the TSSAC timeline into alignment with the AFMA budget cycle, and AFMA Research Committee timeline.
73. The proposal is also to move to full research proposals only, instead of having a pre-proposal process. The pre-proposal template previously had three sections less than full proposals (milestone information for budgets, special conditions for the project, and data management). There is minimal work associated with completing the three sections.
74. In order to fulfil the consultation with Torres Strait communities, before a project is supported for funding, the proposal is for the TSSAC to provide conditional approval to full proposals, on the proviso that any required consultation is undertaken, and there is support from communities. The TSSAC will then consider the community feedback and provide final approval for the project for funding.

75. Any comments which TSSAC have on the full proposal will be provided back to the project team, and amendments to the full proposal can be made and submitted with their consultation outcomes.
76. The TSSAC **RECOMMENDED** that under this new timeline, researchers should provide their stakeholder engagement strategy and community consultation package with their proposal, so it can be considered by the TSSAC, as is the current process.
77. The TSSAC acknowledged that the community engagement is an area the TSSAC can continue to improve on, and will encourage this with researchers and the support of the Executive Officer.

**ACTION:** TSSAC Executive Officer to amend the research application, include a requirement for researchers to submit the stakeholder engagement strategy and community consultation package with their full proposal.

## 7 Other Business

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### 7.1 Date and venue for next meeting

78. The TSSAC tentatively scheduled the full proposal meeting 29-30 March 2022 for the next meeting. However the Executive Officer will make contact in January to confirm dates once the TSIRC meeting dates are set.
79. The next meeting will be in May, and likely a teleconference to discuss the outcomes of the community consultation, and August will be the next scoping meeting.
80. The next meeting will be held on Tuesday 30 November to Wednesday 1 December on Thursday Island. This meeting will invite FRDC and any other agencies of possible funding providers identified.

### 7.2 Meeting Close

81. The Chair thanked members for attending the meeting. The meeting was closed with a prayer at 2pm Queensland time.

**Table 1. Summary of TSSAC 80 recommendations**

Agenda Item #	Recommendations
3	<p>The TSSAC reviewed each of the project scopes, and <b>RECOMMENDED</b> that:</p> <ul style="list-style-type: none"> <li>f) The curryfish conversion ratio project stay as a priority project to pursue in 2022-23 on advise from a Traditional Inhabitant member.</li> <li>g) the three BDM scopes should be combined, to allow possible cost savings, however the scope should ask for the separate costings for the three different project elements, in case funding cannot be secure for all three parts of the project.</li> <li>h) five scopes in total be released in the call for research in 2022-23, which includes the triple project scope for the Beche-de-mer fisheries, and the non-commercial catch project scope, noting the TSSAC will continue to pursue additional funding for this project.</li> <li>i) the Climate change project should not be released through the TSSAC call, but left with FRDC (and the Chair and AFMA to follow up) in a hope FRDC will take a lead role in progressing this project.</li> <li>j) a second call for research be considered for the climate project if the work with FRDC does not progress this project through other avenues.</li> </ul>
4	<p>82. The TSSAC <b>RECOMMENDED</b> uploading to the PZJA website, TSSAC funded research projects back to 2013, which is the time period since the other project was finalised, as detailed in the spreadsheet. This will include the project title, date of completion of the project, and the Project primary investigator's name.</p>
5	<p>The TSSAC <b>RECOMMENDED</b></p>

Agenda Item #	Recommendations
6.1	The TSSAC <b>RECOMMENDED</b> to hold over agenda item 6.2 – the review of the procedure for undertaking research in the Torres Strait, to our next meeting, to ensure we give adequate time to discuss this important agenda item.
6.2	The TSSAC <b>RECOMMENDED</b> that under this new timeline, researchers should provide their stakeholder engagement strategy and community consultation package with their proposal, so it can be considered by the TSSAC, as is the current process.

**Table 2.** Actions from TSSAC 80 and progress against actions from past TSSAC meetings.

Action	Action item	Member	Progress
80.1	TSRA to organise meeting with Malu Lamar and AFMA to discuss copyright considerations for Torres Strait research, to ensure proper partnerships and copyright management relating to any Traditional Ecological Knowledge and data ownership. Once preliminary discussions and work are completed, the TSSAC should be presented with options for managing research data and copywrite, including a copy of the standard TSSAC research contract template for consideration.	TSRA	
80.2	TSSAC Chair and AFMA to follow up with FRDC regarding the climate change project discussions.		
80.3	TSSAC Executive Officer to draft non-commercial catch monitoring scope and send to TSSAC scientific members for input, before providing to the broader committee.		

<b>80.4</b>	ensure the white teatfish project be specified as a priority it the combined BDM scope.		
<b>80.5</b>	AFMA to consider possibilities of adding provisions into research contracts for researchers to provide metadata (and data if confidentiality can be managed) and reports to AFMA, for inclusion in the CSIRO database.		
<b>80.6</b>	AFMA to follow up with FRDC who agreed to look into why Torres Strait fisheries are not included in the FRDC GVP calculations, which would increase the overall pie, and how the matching industry contribution to be accessed.		
<b>80.7</b>	AFMA to follow up with FRDC who agreed to look at whether there are any impediments to Torres Strait fisheries being a part of the voluntary FRDC contributions, to allow them access matching funding available from FRDC.		
<b>80.8</b>	AFMA to follow up with the FRDC who agreed to provide paperwork explaining the FRDC funding model for distribution to members.		
<b>80.9</b>	AFMA to follow up with FRDC, who agreed to discuss the climate change project with Alan Jordan from NESP in a meeting on 2 December. FRDC hope to get interest from NESP in being a part of a consortium between FRDC, NESP, TSRA and AFMA.		
<b>80.10</b>	AFMA to follow up with FRDC who agreed to talk to Chris Calogeras (the EO of the IRG) regarding the non-commercial catch project to see if they are interested to support this.		
<b>80.11</b>	TSSAC Chair and AFMA to follow up with FRDC regarding the climate change project discussions.		

<b>80.12</b>	TSSAC Executive Officer to draft non-commercial catch monitoring scope and send to TSSAC scientific members for input, before providing to the broader committee.		
<b>80.13</b>	TSSAC Executive Officer to amend the research application, include a requirement for researchers to submit the stakeholder engagement strategy and community consultation package with their full proposal.		
<b>ONGOING ACTIONS FROM PAST MEETINGS</b>			
<b>Action</b>	<b>Action item</b>	<b>Member</b>	<b>Progress</b>
<b>79.1</b>	Contact TSIRC to discuss options for providing a presentation on Torres Strait research at a TSIRC meeting. This aims to give councillors background on research, including the pre-consultation processes we use to engage councillors as a part of project development.	<b>AFMA</b>	<b>Ongoing.</b> This item is paused until the new research procedure is finalized, so we are providing the most current information to TSIRC.
<b>79.2</b>	AFMA/ TSRA to consider whether information within the climate change slideshow could be useful to put into an infographic for presentation to communities.	TSRA AFMA	<b>Ongoing.</b> Complete this in time for community visits in February if possible.

## ATTACHMENT A – TSSAC 80 meeting agenda

# 80th MEETING OF THE TORRES STRAIT SCIENTIFIC ADVISORY COMMITTEE (TSSAC)

30 November to 1 December 2021

(QLD time) 930am-430pm Tuesday 30th, 930am- 2pm Wednesday 1st

Video Conference and JCU facility TI (Torres Strait members)

DRAFT AGENDA

## MEETING DAY 1

### AGENDA ITEM 1 MEETING ADMINISTRATION

#### 1.1 Acknowledgement of Traditional Owners, welcome and apologies

The Chair will welcome TSSAC members, permanent observers, and casual observers to the meeting.

#### 1.2 Adoption of agenda

The TSSAC is invited to consider and adopt the draft agenda.

#### 1.3 Declarations of interest

TSSAC members are invited to declare any real or potential conflicts of interests to the group and determine whether a member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict.

#### 1.4 TSSAC 79 Meeting record and actions arising from past TSSAC meetings

The TSSAC will note the status of action items arising from previous TSSAC meetings.

### AGENDA ITEM 2 RESEARCH PRIORITIES FOR BROAD TORRES STRAIT RESEARCH PROJECTS

The TSSAC should discuss the two scoping project outcomes again, including possible funding sources, and the which of the four elements of the suggested ongoing climate change work are the highest priority. This item will be discussed again at the start of day 2, as a presentation to FRDC.

## MORNING TEA

### AGENDA ITEM 3 2022-23 BUDGET AND RESEARCH PRIORITIES

Review RAG and WG research priorities and combined annual research statement. Agree to research priorities for 2022-23 financial year, and finalise projects scopes for call for research.

## **LUNCH**

### **AGENDA ITEM 3                    2022-23 BUDGET AND RESEARCH PRIORITIES**

## **AFTERNOON TEA**

### **AGENDA ITEM 4        HISTORIC RESEARCH PROJECT DATABASE**

An update will be provided on the collation, and storage, of reports from historic TSSAC funded research.

## **CLOSE MEETING DAY 1**

## **MEETING DAY 2**

### **AGENDA ITEM 5                    INTRODUCTION TO TORRES STRAIT FISHERIES AND FRDC VERBAL UPDATE**

A brief background on the key Torres Strait fisheries will be provided for the benefit of invited guests.

### **AGENDA ITEM 2 (continued)        RESEARCH PRIORITIES FOR BROAD TORRES STRAIT RESEARCH PROJECTS**

The TSSAC will receive a short presentation for two priority projects. This will include outcomes of discussions at TSSAC 79, regarding TSSAC support for these projects going forward.

## **MORNING TEA**

### **AGENDA ITEM 6.1                    PROPOSED CHANGES TO RESEARCH FUNDING TIMELINE**

### **AGENDA ITEM 6.2                    REVIEW OF PROCEDURAL FRAMEWORK FOR UNDERTAKING RESEARCH IN TORRES STRAIT**

### **AGENDA ITEM 7                    OTHER BUSINESS**

#### **7.1        Date and venue for next meeting**

## **CLOSE OF MEETING**



## ATTACHMENT B - RECOMMENDATIONS AND ACTIONS REGARDING THE NON-COMMERCIAL CATCH PROJECT

The TSSAC **AGREED** on the following recommendations and actions, if this project moves forward:

- The project should be split into two phases, and the project scope released in the call for research should only include step 1 and 2 (“phase 1”) of the five step process above. These two steps will cost out the rest of the project, at which time the relevant PZJA forums and TSSAC will consider the project for funding the remaining steps (pilot and full implementation). This is noting it is not possible for the project team to cost all five steps, until step 1 and 2 are complete, and it is difficult for a funding provider to support a project which has an undefined budget for parts of the work.
- That the focus of this project should remain with non-commercial catch of commercial species initially, however if communities wish to collect other information early on in the project, as their own initiative, this could be incorporated. This would be determined through step 1 and 2 of the project, using a co-design method with communities. In particular, communities should be consulted on whether they have any data they would like to collect (such as non-commercial species data) through this app for their purposes (not related to fisheries management as it isn't the PZJAs mandate), which would add value to it beyond non-commercial catch of commercial species. They also need to guide the data storage and access process, including the types of people they would want to share the data with (like family groups, island groups or broader).
- Community expectations need to be managed around the full project going ahead, noting only the first two steps will be funded initially, if the project goes ahead.
- All Torres Strait communities, and Northern Peninsula Area communities should be consulted as a part of any future project.
- The non-commercial catch monitoring project research scope should include a requirement to consider alternative tools to an app, that fulfil the same function (such as webforms) as the non-commercial take monitoring tool, to ensure value for money, including upkeep and maintenance costs.
- Ensure data biases are accounted for if the non-commercial catch monitoring project progresses, noting there will be some fishers reporting a lot and others not at all, skewing results. Statistically adjusting the data will account for this, and needs to be considered in this project.
- Ensure project team work alongside AFMA if the non-commercial catch monitoring project progresses, to ensure the data is collected in a way that will allow the data to be pulled into the AFMA database (if AFMA was chosen to be used to store the data).

- Draft scope for the non-commercial catch data collection project to be developed for TSSAC 80 meeting in November, for scoping discussions.
- Data ownership and intellectual property for the non-commercial catch data collection project needs to be discussed and managed effectively based on community needs. This can be established during the consultation phase of the project.
- Non-commercial catch data collection project team to consider what environmental (or other) data that could be collected through the app, which would be useful for managing climate change or other factors relevant to managing commercial fisheries.

The TSSAC **NOTED**:

- That the first two steps may take longer than a year, given their complexity (including deciding what data to collect beyond commercial species, and where and how to house the data) and the level of consultation required. However undertaking the work as quickly as possible is a priority.

## **ATTACHMENT C – draft climate change project scope**

### **Torres Strait Scientific Advisory Committee 2020-2023 financial year research project scope**

**Project Title:** Understanding climate variability and change relevant to key fisheries resources in the Torres Strait and adaptation and mitigation strategies.

#### **Project Need:**

Due to their strong connection to the marine environment, Torres Strait Island communities are uniquely reliant on their only significant renewable resource, fisheries. Key commercial species in Torres Strait fisheries, such as tropical rock lobsters, prawns, finfish and beche-de-mer, and the environment they rely on, will be influenced by current and future climate variability and change. These changes have the potential to disrupt fishers and fishing communities livelihoods and threaten food security, and understanding their likely extent is essential to enable mitigation and adaptation to occur. There has been relatively little investment in research on fisheries-related climate change issues in the Torres Strait, compared to other areas of Australia.

Fisheries management and assessments will need to take account of the implications of future variability and change that may affect stocks. These may manifest through effects on recruitment pathways, mortality rates, and critical habitats among other processes. Previous reviews have qualitatively assessed the vulnerability of the Torres Strait to climate change effects; however, there is a need to account for these in a quantitative manner for fisheries management and communities to respond appropriately. A quantitative MICE model (Model of Intermediate Complexity) has already been completed in the Torres Strait region for tropical rock lobster, as a part of understanding the annual variability in abundance. Separate fishery specific assessment models for multiple species, will all require essentially the same over-arching regional-scale data. This data should cover future climate and environmental variability, including currents, winds, temperature, rainfall etc, at an appropriate spatial extent and grid-resolution.

If this project is funded, the model which is developed should be transferrable to other fisheries around Australia. The outcomes of the project will also provide climate variability information which is likely to have widespread benefits to support the communities of the Torres Strait to adapt, beyond just fisheries management.

#### **Progress to date:**

AFMA has completed a scoping study that has delivered an evaluation of the over-arching data requirements and framework that are needed to support a climate change model that will evaluate the implications of future climate variability and change scenarios on key fisheries. The study considered previous reviews of climate implications for Torres Strait, consulted extensively with relevant fishery researchers, managers and key stakeholders and convened a workshop, with relevant fishery modelling expert end-users and stakeholders. The final report provided a specification and preliminary costing for a climate change project on which this project scope is based.

#### **Desired outcomes**

The proposed project and resulting model and findings should:

- i) enable fisheries managers and communities to better prepare for climate change mitigation and adaptation, where possible;
- ii) integrate new and existing fisheries and environmental data within an over-arching data framework;
- iii) provide estimates of the impacts that different climate change scenarios could have on the marine ecosystem and associated fisheries/species;
- iv) provide estimates of the economic, social and other fisheries-related livelihood impacts of climate change on communities in the short (2 yrs), medium (5 yrs) and longer term (10+ yrs); and
- v) help differentiate between the relative effects of fishing and climate change on marine resources.
- vi) provide results in formats (e.g. graphical, video, written) which can be communicated to stakeholders (Torres Strait Island Communities, Fishers, Fisheries Managers and local and regional organisations).

While the full proposed project would take 3-5 years to complete, there is an urgent need to gain early estimates of climate change impacts, noting that these estimates will be refined over time as the model is further developed and new data included.

### **Project outputs, time frame and cost estimates**

The proposed project would consist of four stages, which would be scheduled according to funding and researcher availability.

Steps 1 and 2 would need to commence simultaneously and be capable of providing preliminary estimates of climate change impacts within two years.

If funding was available, it would be preferred (but not essential) if Step 4 could be commenced at the start of the project. This will allow the project to be completed more quickly, which is the preference of Torres Strait communities and fishery managers.

Other than the data collected under Step 4, the proposed project will use existing and ongoing (funded) data, including those from global climate models, the Bureau of Meteorology and Torres Strait weather and marine monitoring data which has been collected by TSRA and AIMS. The already available data will allow the project team to begin modelling sooner if the project goes ahead. New data sources, including exploring opportunities to work with the Integrated Marine Observing System (IMOS) to establish sites within Torres Strait will also be considered.

1. Production of an over-arching data framework (approx. one year) **A\$120k**
2. Development of an integrated modelling framework that would combine existing data and models (tropical rock lobster, beche-de-mer and dugongs) into an integrated MICE (approx. two years) **A\$460k**
3. Development of a regional hydrographic modelling platform resulting in a high-resolution physical circulation model (approx. two years) **A\$350k**
4. A short term data acquisition programme using moored data loggers and conductivity temperature depth (CTD) casts to collect additional physical data (including temperature, salinity currents and surface elevation) over at least one set of wet and dry seasons **A\$160k per year**

