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Report of Workshops on integrated management of marine activities

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Executive Summary

The need for integration of management in relation to diverse marine activities is increasing. Without integration, different groups manage different activities inconsistently, there are conflicts from overlapping or competing activities, and there is no ability to consider the cumulative impacts of multiple activities. Further, and increasingly important, some form of integration of management will be required to deal effectively with climate change. However to date there has not been an agreed approach for Integrated Management (IM).

In 2017 and 2018, a team of researchers associated with the Centre for Marine Socioecology (CSIRO and UTas) and partners (SARDI and DFO), collaborated to develop a framework for implementation and a 'lens' for evaluation of Integrated Management (IM). The research team then convened two workshops to test the framework with a broader group of subject matter experts, and to apply the lens to Australian IM case studies. The case studies included Gladstone Harbour (Queensland), management arrangements related to Great Barrier Reef (GBR) Marine Park (Commonwealth), development of Northern Prawn management (Gulf of Carpentaria), the South-East Queensland Healthy Waterways Partnership initiative (SEQ HWP), the Australian Oceans Policy (AOP) (2001-2005), the New South Wales (NSW) Marine Estate initiative, and progress toward IM in the Spencer Gulf (South Australia).

This report describes the outcomes of those workshops, specifically the factors that enable or hinder the success of integrated management, and identification of critical features that will help improve future integrated management.

The framework that was tested in this study is considered comprehensive in relation to both the key features and major phases of implementation of IM. It offers both a tool for evaluation of IM, and a framework for implementation of IM in an area across a group of activities.

The seven case studies considered in this project represent a broad spectrum of forms and degree of integrated management. While the attempt to implement widespread IM in the AOP was not successful, there are more recent or ongoing initiatives that have had at least partial or temporary success in implementation. The Great Barrier Reef Marine Park management arrangement is a long-standing process that has evolved from management of an MPA through spatial planning to IM. The SEQ HWP and Gladstone Harbour initiatives were established to overcome problems (crises) that were not being addressed (or able to be addressed) by management of individual activities. The New South Wales case study is a modern attempt to reform governance and management in a 'whole of Government' approach. The evolving Spencer Gulf planning is an attempt to put in place an integrated framework to guide anticipated future development without compromising existing activities and ecosystem services. Finally, the Northern Prawn fishery case study offers a perspective of the potential path of activity-based planning in an area in which interactions with other activities are increasing.

Although the general concept for IM has been around for many years, there have been few examples of successful and long-term implementation. This has been due in part because of lack of a common vision and approaches for implementation. We suggest that the framework presented in this report is an appropriate template for successful IM. The framework builds on existing management, and therefore represents incremental change. It prescribes nine key features and five important phases of implementation that we suggest are relevant in all cases. Use of this framework should result in successful IM and should overcome the key common failings of existing sector-based management.

Of the key features of IM, it seems the critical aspect is development of appropriate governance structures that will bring together the various relevant sectors and management agencies and empower a group to be able to proceed with IM. That aspect requires further research. Future IM initiatives will quickly see the need for tools to assist in a) evaluation and management of trade-offs, and b) evaluation of cumulative impacts of multiple activities. Anticipatory research on how those two aspects could be addressed in an IM framework is important.

Recommendations: We make the following recommendations based on this project:

R1 – We recommend consideration of the vision articulated in Fig 1 as a candidate model for Integrated Management. That model builds on existing management, articulates the critical features of IM and explicitly overcomes major deficiencies of current sector-based management.

R2 – We recommend inclusion of the nine key features articulated in the project (Fig. 2) as a recipe for ‘best practice’ in implementation of all future IM projects.

R3 – We propose consideration of the five phases articulated in this study (Fig. 2) when implementing future IM initiatives.

R4 – We recommend use of the lens (with nine features and five phases; Fig. 2) as an evaluative tool for IM initiatives.

R5 – We recommend further investigation of the development of appropriate governance structures that will bring together the various relevant sectors and management agencies and empower a group to be able to proceed with IM.

R6 – We recommend that this framework be used to implement Integrated Management either in collaboration with ongoing reform by management agencies or as a holistically designed Integrated Management application.

R7 – We recommend further development of tools to assist in a) evaluation and management of trade-offs, and b) evaluation of cumulative impacts of multiple activities.

Keywords

marine governance, marine spatial planning, ecosystem-based management, trade-offs, cumulative impacts

Introduction

There is evidence, in Australia and internationally, of the increased need for an improved, practical approach to integrated management (IM) of fisheries and other marine activities that is able to:

- 1) include multiple activities in an effective governance process,
- 2) fully embrace the social, cultural, economic and institutional aspects (the so-called ‘human dimensions’) as well as environmental aspects of management,
- 3) evaluate trade-offs and cumulative effects (ecological, social, cultural, and economic) of multiple activities, and
- 4) respond effectively to climate change.

As is the case in the terrestrial environment, different activities compete for space and impact/influence one another. There is need for oversight and a more holistic approach that can add some consistency of management objectives, address trade-offs or conflicts, and importantly can evaluate cumulative impacts. The development of a successful and broadly applicable IM framework, however, remains elusive. Most management of multiple activities in the marine realm has been additive, with primary focus on individual activities, and only secondary consideration of fitting one activity in among other existing activities. The implementation of IM has been complicated by the fact that there is still no proven ‘recipe’ or best practice for IM. Further, there has been insufficient evaluation of the successes and of the failures of attempts to integrate activities or to achieve IM in a marine context, in large part because of the lack of a comprehensive lens for evaluation.

In 2017 and 2018, a team of researchers associated with the Centre for Marine Socioecology (CSIRO and UTas) and partners (SARDI and DFO), collaborated to develop a framework and evaluative lens for IM which was defined as *‘An approach that links (integrates) planning, decision-making and management arrangements across sectors in a unified framework, to enable a more comprehensive view of sustainability and the consideration of cumulative effects and trade-offs.’* (Figs 1 and 2; Stephenson et al. 2019).

The research team then convened two workshops to test the lens with a broader group of subject matter experts, and to apply the lens to Australian IM case studies. This report describes the outcomes of those workshops, specifically the factors that enable or hinder the success of integrated management, and identification of critical features that will help improve future integrated management.

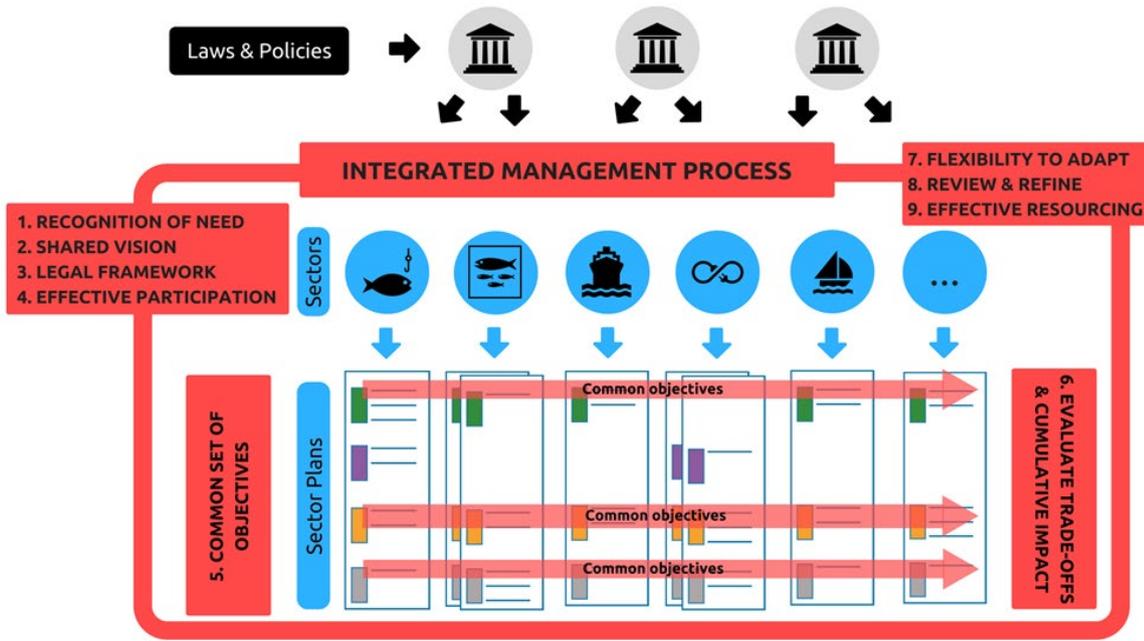


Figure 1. Conceptual representation of a practical framework for Integrated Management, which could overcome the major shortcomings of current management with minimum change to existing sector-based management structure and function. Sectors (blue icons) retain specific management plans (represented by blue rectangles), but a participatory Integrated Management process would influence a key set of objectives in sector plans so as to be able to evaluate trade-offs and cumulative effects and provide effective and practical integration.

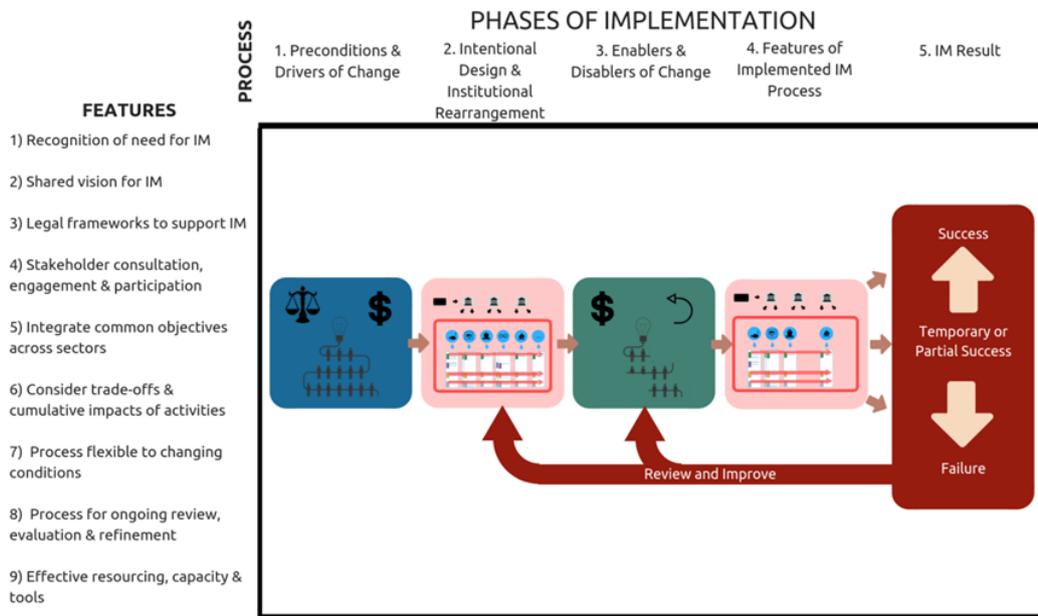


Figure 2. Lens for evaluation of Integrated Management: The nine key features of Integrated Management (IM) and the five phases that make up the likely process of implementation form both a template for implementation, and a lens for examination of the effectiveness, of IM.

Objectives

The objectives of this project were:

1. Complete the creation of a lens for evaluation of Integrated Management that includes appropriate attention to social, cultural, economic, institutional as well as ecological aspects
2. Convene two workshops involving expert practitioners with sufficient scientific and operational knowledge of existing Australian Integrated Management case studies
3. Evaluate and compare experience on implementing Integrated Management in Australia using a single evaluative lens
4. Synthesize and report results of the evaluation and make recommendations for improved IM in Australia

Method

Teams comprising both science and operational knowledge of Australian IM case studies were brought together in two workshops, one in Hobart (March 27/28, 2018) and one in Brisbane (April 9/10, 2018). The prime objectives of the workshops were to test the utility of a lens in evaluating and comparing experiences of IM and identifying key elements of success and failure of Integrated Management. Participants (listed in Appendix 1) were selected for their experience in case studies of interest, knowledge and experience of IM in Australia, or in the development of the investigative lens.

The Principal Investigators (PI's) for this project were Rob Stephenson (DFO) and Alistair Hobday (CSIRO). The workshops were facilitated by the R. Stephenson, A. Hobday, Maree Fudge (CMS), Christopher Cvitanovic (CMS) and Tim Ward (SARDI). Participants collaborated in both breakout groups and plenary sessions to populate the lens tool (Table 1), to deliberate on results and to make comparisons. Group discussions were captured via written notes by the project team and photos of whiteboard work.

Participants reviewed the framework and then examined case studies for evidence of a set of nine key features and five phases of implementation that are expected of IM as identified by Stephenson et al (2019):

Nine key features of IM (from Stephenson et al. 2019)

1. Recognition of the need for Integrated Management (by government and other stakeholders including relevant community and science)
2. A shared vision among participants regarding a structure of Integrated Management
3. Appropriate legal and institutional frameworks for coordinated decision-making
4. Sufficient and effective process for appropriate stakeholder consultation, engagement and participation
5. A common, comprehensive suite of specific objectives (ecological social, cultural, economic and institutional) integrated across sectors/activities, with a clear process to assess progress against those objectives.
6. Explicit consideration of trade-offs and cumulative impacts of multiple activities
7. Process flexibility to adapt to changing conditions
8. Process for ongoing review, evaluation and refinement
9. Effective resourcing, capacity and tools

Five phases of implementation of IM:

1. pre-conditions and drivers of change,
2. intentional design and institutional rearrangements undertaken to produce IM,
3. factors which acted as enablers or disablers of (barriers to) IM,
4. features of the resulting IM process, and
5. the degree of success, review and improvement (as in Table 1).

Through a facilitated deliberative process, the workshop participants examined each of the nine key features and five phases of development of IM (articulated in Table 1):

Table 1: Framework or lens for evaluation of Integrated Management case studies includes nine key features (blue) and five phases of implementation (green).

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
1) Recognition of the need for Integrated Management					
2) A shared vision for Integrated management					
3) Appropriate legal and institutional frameworks for coordinated IM decision-making					
4) Sufficient and effective process for appropriate stakeholder consultation, engagement and participation					
5) A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.					
6) Explicit consideration of trade-offs and cumulative impacts of multiple activities					
7) Process flexibility to adapt to changing conditions.					
8) Process for ongoing review, evaluation and refinement					
9) Effective resourcing, capacity and tools					

A spectrum of IM case studies was chosen by the Principal Investigators and Facilitators to include different geographic location, scale, longevity, jurisdiction and activities, so as to examine how insights may be applied across the full typology of IM cases. The case studies included:

- Gladstone Harbour (Queensland),
- management arrangements related to the Great Barrier Reef (GBR) Marine Park (Commonwealth),
- development of Northern Prawn management (Gulf of Carpentaria),

- the South-East Queensland (SEQ) Healthy Waterways,
- the Australian Oceans Policy (2001-2005),
- the New South Wales (NSW) Marine Estate initiative, and
- progress toward IM in the Spencer Gulf (South Australia).

Our intention was to work collaboratively to populate the framework as presented in Table 1 with information from each case study and to look across case studies for similarities and differences in experience.

In the first workshop (March 27/28, 2018 in Hobart) the lens was tested in relation to the Australian Oceans Policy experience, the NSW Marine Estate and Spencer Gulf examples. In the second workshop (April 9/10, 2018 in Brisbane) the cases of the Great Barrier Reef, Gladstone Harbour, SEQ Healthy Waterways, and Northern Prawn Fishery (NPF) management plans were considered.

Results

The research team discussed and agreed to the content of the framework for Integrated Management, and to its use in evaluating IM in the workshops (Objective 1). Two workshops were held - one in Hobart (March 27/28, 2018) and one in Brisbane (April 9/10, 2018) (Objective 2). Workshop participants are listed in Appendix 1. Experience in implementing IM was evaluated (Objective 3) using the evaluative lens applied to seven case studies as described below and summarized in tables (Appendix 3).

The case studies

Australia's Oceans Policy. Australia was one of the first two nations in the world to formally recognize the need for integrated management. *Australia's Oceans Policy* (AOP), released in 1998, focused on providing a framework for integrated ecosystem-based management of Australia's vast marine domain. It followed the Offshore Constitutional Settlement¹ (1979), and was part of Australia's international commitment to UNCED. AOP came at a time of concern regarding increased ocean uses and the sustainability of fisheries. It followed a decade of strong collaboration across jurisdictions in which there was agreement that something integrated was required. The AOP set forth a vision for IM that was articulated at the highest political level by the Prime Minister, but it was not clear if the vision applied to State as well as Commonwealth waters. The AOP was policy, and was not enacted through legislation but through a joined-up approach of all management agencies to work together under a set of common governance arrangements. It collated into a single planning framework a complex of disparate laws and regulations that were sometimes in conflict. The strength of long-established sector-based planning provided a solid base for individual sector management but also weakened the ability of the AOP to push through new IM activities. The AOP was administered by a newly established National Oceans Office which had some successes in advancing a broader view of IM within single sector management, but ultimately was closed down with regional planning reduced in scope to environmental matters only under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. While this did mean that marine planning had legislative backing, it was reduced in scope to only environmental outcomes relevant to the Commonwealth government. There was considerable effort devoted to engagement (some stakeholders referred to being "over-consulted") in a consensus-based process, and key stakeholders understood what the AOP framework was trying to accomplish, but there was a lack of broader community buy-in and the initiative eventually lost support from key sectors and became bogged down in process. The AOP was generally heralded as a good idea, but failed to be implemented successfully in part due to a lack of tools available to support the process. The AOP had a comprehensive set of principles and objectives, but no clear process of how to link objectives together. It tried to include diverse aspects of management, including things that could have just been dealt with by existing sectoral management. By trying to be comprehensive in considerations and to achieve consensus, the AOP became too complicated and could not take action in relation to the objectives. While the AOP did not explicitly mention trade-offs this was widely considered by stakeholders as a key objective and the AOP processes contributed positively to understanding of issues among diverse participants, but failed to implement a framework for explicit consideration of trade-offs or of cumulative effects. The AOP was flexible at first, but after 2005 became more rigid and became bogged down under the weight of its processes. There were planned processes for evaluation, and the first (2002) evaluation was outsourced. AOP failed to complete all of its anticipated objectives in the first 5 years. The AOP had considerable capacity in terms of people in diverse jurisdictions with experience of management, science and academia. However, the task of national planning was large, and it became complicated by dealing with multi-jurisdictional issues which became difficult to navigate in terms of who was responsible for delivery of outcomes. It also suffered from being a novel undertaking across jurisdictions so that it was a process of learning as well as of plan development. Timelines slipped and the initiative eventually stalled.

¹ The offshore constitutional settlement as legislated through *the Coastal Waters (State Powers) Act 1980* and *Coastal Waters (State Title) Act 1980*

The Great Barrier Reef (GBR) Marine Park management arrangement. The GBR has iconic status and has been on the World Heritage list since 1981. The need to manage a unique and important natural feature in relation to diverse values and increasing human uses has been recognised for many years. Concern over proposals for mining and oil exploration in the 1960 led to a Royal Commission (in 1970-1974) and to the *Great Barrier Reef Marine Park (GBRMP) Act 1975*. Integrated planning of the GBR began with sections of the Marine Park being gradually declared and zoning plans put into effect, as required under the Act, from the 1980s to the early 2000s. This culminated with the Amalgamated Great Barrier Reef Section coming into effect on 1 July 2004. The entire Marine Park is now declared and zoned. Considerable effort was put into developing a shared vision among all stakeholder groups, and a shared vision for integrated management evolved over time. Under the *GBRMP Act* an independent statutory authority was established (GBRMPA), and complementary State legislation was also developed (supported by the GBR intergovernmental agreement, originally known as the Emerald Agreement). Effective stakeholder participation has been a priority throughout the history of management of the GBR Marine Park. The GBR management process has had success building a foundation of strong consultative and participatory engagement processes and trusted relationships among participants. The GBR has had clear objectives and outcomes across a suite of values including environment, biodiversity, heritage values and sustainable uses. GBRMPA publishes an Outlook Report every five years on the Reef's condition, management effectiveness and risks, and continues to develop a fit for purpose integrated monitoring, modeling and reporting program. Objectives have been updated over time, and further ecological, social, cultural, and economic indicators are being developed. GBR planning and management has continued to adapt over time. Modern plans are built on the principles of adaptive management, with explicit review periods and have built-in contingency plans to adapt to changing circumstances. The comprehensive strategic assessment of the GBR examined the impact of multiple activities on values across the marine and coastal zone using an adapted driver-pressure-state-impact-response framework. The Reef 2050 Long-Term Sustainability Plan (Reef2050 Plan) and associated policies include consideration of a more comprehensive set of objectives and outcomes, explicit consideration of cumulative impacts, and draft offsets guidelines. GBR management has been supported by a longstanding joint agreement on co-funding among State and Federal governments, and an investment framework that identifies all resources across government and key sectors. The process has had access to outstanding scientific expertise, experiential knowledge among managers, and a long legacy of reef research. While relatively well funded, there is still an issue of keeping up with expanding issues, the most important of which is climate change, which requires global cooperation..

SEQ Healthy Waterways Partnership initiative (SEQ HWP) resulted from recognition of the need for integrated efforts across catchments and coastal waters in order to achieve improved water quality in the waterways flowing into Moreton Bay. Water quality had been declining across the region and further declines were forecast due to increasing development and particularly urbanisation of catchments (Abal et al. 2005, Pantus and Dennison 2005). Local Councils were incapable of making improvements individually, and it was recognized that collective action was required. There was widespread public awareness of deteriorating water quality and appreciation of the need for an integrated approach to improve waterways health. An ambitious vision was established early in the process, and marketed widely to achieve public support. The SEQ HWP initiative was largely voluntary, but there was pressure among Councils that they needed complete participation and that they should act together. Queensland State Government was supportive and a partner of the initiative. The Partnership was supported by a series of legislation and plans including *Queensland's Coastal Protection and Management Act (1995)*, the State Coastal Management Plan (2002), and the SEQ Regional Plan (2009). Stakeholder participation was critical from the beginning, and the reports refer to a 'whole of community' approach, a 'pro-active stance on community involvement and participation', and to a set of values including transparency. The Partnership developed a report card that included aspects of ecosystem health, access, economic benefit, quality of drinking water and other community values. The reports of all local Councils provided an evaluation of cumulative performance across the catchments. The SEQ HWP has evolved over time in function (for example revised sampling approaches supporting monitoring), structure and funding. The partnership was supported by Councils and the Queensland government. Sufficient resourcing was maintained for quite a while, but State funding was reduced with a change in government in 2012. This resulted in changes in the way the HWP operated in the region.

Gladstone Healthy Harbour Project (GHHP). Gladstone Harbour is a large multi-commodity port and the world's third largest coal terminal (GPCL 2013a). The port supports diverse uses including commercial fisheries, extensive urban areas, one of Queensland's major power stations, local heavy industry (including Liquefied Natural Gas (LNG) and one of the world's largest aluminium smelters), and is an export conduit for the inland mining and gas industries. Further, there are extensive terrestrial parks to the north and northwest of the port and the harbour is within the Great Barrier Reef World Heritage Area. Tension around development, and issues related to environmental quality (including air quality and fish kills) resulted in public outcry, and in 2012/2013 to establishment of the GHHP. The recognition of need for an integrated approach to management was widespread, and included high-level State government support. A period of consultation at the start of the GHHP resulted in development of a clear vision for a partnership, supported by an independent science panel, to monitor health of the port using a report card. While GHHP has no regulatory authority, it brings industries and port operators together to evaluate activities and to inform current management and future port development, and is therefore a collaborative integrated management example. GHHP has 26 partners across industry, indigenous representatives, regulatory bodies, community groups and academia. The partnership and processes (including governance arrangements) are laid out in a Memorandum of Understanding. The GHHP oversees the reporting of the monitoring program; synthesising the information to produce a report card that includes environmental, social, economic and cultural indicators (GHHP 2015b); and uses a range of tools (including systems models) to provide advice to policy, management and regulatory agencies, as well as industry and other stakeholders. The GHHP is driven by consideration of cumulative impacts, and has identified some trade-offs, but does not have a mechanism for resolving, or managing these interactions. GHHP has evolved with changing conditions and has considerable local impetus. It remains a voluntary partnership that is aware of emerging regulatory requirements and community desires, and is able to work collaboratively when new issues arise. GHHP has been able (to date) to assemble resources from diverse sources (especially from members) to continue.

The NSW Marine Estate initiative arose out of stakeholder discontent in relation to the implementation and management of marine parks in New South Wales. This led to an independent review of marine park science in 2009, followed by a scientific audit of marine parks, and a parliamentary enquiry into recreational fishing. The scientific audit identified a need for more comprehensive governance arrangements for the entire marine estate, including a greater emphasis on social and economic research, as well as the adoption of a threat and risk approach to identifying and prioritising management actions (Beeton et al. 2012). In 2013 the NSW Government established the Marine Estate Management Authority (MEMA) to work across four primary State agencies involved in coastal management to develop a Marine Estate Management Strategy. The Strategy addresses the priority threats to the social, cultural, economic and environmental benefits derived by the communities across the whole of NSW from the marine estate (Jordan et al. 2016, Brooks and Fairfull 2017, Gollan et al. 2019). The vision for the MEMA was to coordinate efforts to achieve a new vision of "a healthy coast and sea, managed for the greatest wellbeing of the community, now and into the future" (Brooks and Fairfull 2017). The legislative and governance frameworks were revised to establish the single new authority to implement this vision. A new *Marine Estate Management Act 2014* was established, the previous *Marine Parks Act* was abolished, and there were several related governance reforms. The *Marine Estate Management Act 2014* established two governance bodies (Marine Estate Management Authority and Marine Estate Expert Knowledge Panel), that were to progress development of a Strategy to address priority threats identified through a formal threat and risk assessment. The Strategy was developed by MEMA to ensure the management of the marine estate is strategic, transparent, evidenced-based and coordinated (MEMA 2018). An engagement and communication strategy formalised stakeholder and community contribution, with a cross-agency commitment to multi-stakeholder engagement.

The MEMA process is explicitly multi-sectoral and triple bottom line, with the threat and risk assessment including distinct environmental, social, cultural and economic components. This allowed the identification and prioritisation of management actions in the Strategy that aim to reduce threats to community benefits. Cumulative impacts are identified in the threat and risk assessment process, and are the focus of multiple actions within specific initiatives (e.g. multiple threats to water quality). Trade-offs are considered in the context of risk tolerance and the relinquishment of a benefit or value for another that is regarded as of greater importance. A Marine Integrated Monitoring Program (MIMP), that includes ecological, social, cultural and economic aspects, provides a structure for review and performance evaluation of management actions. A formal 5 year evaluation will establish if risk levels have changed, and allow incorporation of

new scientific knowledge and changed management arrangements from related government strategies to be incorporated. A single coordinating agency approach such as MEMA allowed the bringing together of existing scientific and management expertise and skills, and added new resources in the creation of advisory groups and secretariat to coordinate across the key delivery agencies for coastal and marine management. While there was limited capability in some key areas (including risk assessment and social/economic analysis), a staged approach, strong engagement with key scientific, stakeholder and community participants in the process, political commitment, and sufficient resources to complete the identified five-step decision making process resulted in the delivery of a comprehensive integrated Strategy for NSW.

Progress toward IM in South Australia and the Spencer Gulf began as part of broad attempt by the South Australian Government to establish ecosystem-based management of its coastal, estuarine and marine environments in the early 2000s. The Living Coast Strategy (Government of South Australia 2004) outlined a range of actions that included the establishment of a Coast and Marine Authority and a marine planning framework. The Marine Planning Framework for South Australia (Government of South Australia 2006a) was based on the principles of ecosystem-based management, ecologically sustainable development and adaptive management (Day et al. 2008, Paxinos et al. 2008). Spencer Gulf was chosen as a pilot study to refine and test the application of the framework because of its economic, social and environmental importance to the State. The draft Spencer Gulf Marine Plan defined goals, objectives and strategies for four ecological zones (Government of South Australia 2006b). Its vision was to ensure the conservation and ecologically sustainable use of the gulf by integration of marine and land use management through partnerships between community, industry and government. A performance assessment system was established to evaluate the effectiveness of the plan. The Marine Planning Framework for South Australia was not implemented and has not been developed further than the initial pilot project in Spencer Gulf. The Spencer Gulf Ecosystem and Development Initiative (SGEDI) was established in 2011 when a broad range of stakeholders recognised the need for a more integrated approach to industrial development in the area (<https://www.adelaide.edu.au/environment/water/spencer-gulf/>). SGEDI was established because of concerns about the potential impact of expanded mining, shipping and desalination activities on the environment, iconic species (e.g. cuttlefish) and the fisheries and aquaculture sectors. SGEDI has been important in bringing stakeholders together. It is a voluntary, participatory structure with diverse representation. The focus of SGEDI has been to develop pilot tools to support IM and demonstrate the benefits of a more integrated approach. As only a few South Australian government departments are actively involved in SGEDI, progress towards IM has been limited. The complex mosaic of legislation relevant to the area and the current articulation of ecological, social economic and institutional objectives of relevant sector plans was summarised by Begg et al (2015). However, there is currently no shared vision or legal framework for IM of Spencer Gulf. Participants in an international workshop conducted in 2015 reported tension around appropriate stakeholder participation in SGEDI, with differences of opinion regarding the best amount of governmental involvement and leadership (Begg et al 2015). Conditions changed during the developmental phase of SGEDI. Currently, the initiative continues despite a reduction in pressure for mining-related development in the gulf. Implementation of IM in Spencer Gulf remains an aspiration.

Development of Northern Prawn Fishery management. Australia's Northern Prawn Fishery (NPF) is a good example of the evolution of single species management toward more holistic or integrated management (see Dichmont et al. 2012 for a summary of management arrangements). Recent changes made in 2016 to the Northern Territory *Fisheries Management Act 1988* require additional consideration of Indigenous and recreational interests in the management of the fisheries. In addition, there has been recognition within the Regional Assessment Group of the interaction of the fishery with other activities in the area, including the prospect of water extraction for agriculture in the Northern Waters project and other developments. These initiatives are being proposed by 'competing' government departments, and some of the higher level trade-offs are likely to be the result of broad political decisions. There is no clear vision of what IM would look like, or how it would relate to existing sector-based management. The legal and operational frameworks for recent fisheries management have been strong and well known, but the revised *Fisheries Management Act 1988* and the need for increased regard to recreational and indigenous sectors require development and implementation. Further, there are complexities in the legislative and jurisdictional considerations with respect to shared management responsibility with Indigenous peoples, and with the interaction with terrestrial and other uses. NPF has a strong tradition of stakeholder engagement in fisheries management planning, but it is uncertain how the extension of considerations will be reflected in participation of other

stakeholders. Existing sector plans recognize a triple bottom line, but are weak with respect to social objectives, and do not recognize the interplay among sectors/interests. Likewise, NPF has already considered some trade-offs in assessment and management, but the expectation is that consideration of a greater range of trade-offs, and consideration of cumulative impacts, will be required. NPF has been flexible and adaptable to date in the evolving considerations of ecological and economic aspects of the fishery. It remains to be seen if this flexibility and adaptation can be extended to a broader range of considerations. The NPF planning (ERA process) has a 5 year planning review cycle. These may create opportunities for evolution of broader review. There is established resourcing for traditional fisheries assessment and management, but the move toward a greater set of considerations and to IM will require more and different types of information and tools, which implies the need for a change in resourcing.

A comparison of results across case studies in relation to key features of IM

Following the workshops, the major results from each case study were collated and compared. This section discusses each of the key features of IM.

Feature 1	Feature 2	Feature 3	Feature 4	Feature 5	Feature 6	Feature 7	Feature 8	Feature 9
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Recognition of need – The case studies show longstanding and widespread recognition of need for integration in the management of coastal marine activities. In the GBR it had been recognized since the mid 1970's (evidenced by the 1979 Emerald Agreement establishing joint field management arrangements between the Commonwealth and Queensland). Australia articulated the recognition of need for widespread integrated management in the Australian Oceans Policy (1998), and this was articulated by the Prime Minister in a headline speech in 1995². Similarly, in the early 2000s the South Australian Government recognised the need to establish a more integrated approach management of coastal, estuarine and marine environments which was articulated through the Living Coast Strategy (Government of South Australia 2004, Day et al. 2008, Paxinos et al. 2008). More recently in Spencer Gulf, a range of stakeholders have recognised the need for integrated decision-making in relation to effects of expansion of mining activities (increased shipping, new ports and desalination plants) on iconic species and existing fisheries and aquaculture sectors (Gillanders et al. 2013). In SEQ, there was recognition that individual jurisdictions were unable to solve water quality problems, and that there was need for cooperative and integrated action by many Local Councils and State Government. In Gladstone Harbour, a series of negative events (including human health issues) associated with overlapping human uses of the harbour resulted in recognition of the need for coordination. In NSW, recognition of the need for integrated planning of the marine estate grew out of dissatisfaction with narrow considerations of MPA planning. In the case of the anticipatory Northern Prawn Management example, there is recognition of recent and pending changes and challenges for the fishery including amendments to the fisheries legislation to include greater consideration of indigenous and recreational interests, agricultural proposals that may impact water quantity (directly linked to marine wild prawn production) and quality, and the need to consider fisheries within regional development plans. It is common, for example, to hear from the fishing sector of the need for future integrated management as they feel vulnerable, in spite of being around the longest, to impact from and potential displacement by other sectors and new activities that are far larger in financial contribution to GDP.

² Keating, P. J. *Oceans Policy: Statement*, Press Release, the Prime Minister, the Hon P. J. Keating, No. 144/95, dated 8 December 1995: "the overall goal of the policy should be to provide the vision that will promote the efficient, sustainable use of Australia's marine resources in the EEZ while conserving the biological base of those resources"



Shared vision – The vision of IM has evolved, and differs in the case studies. GBRMPA’s management approach began with site-based planning and has evolved to include concepts of EBM and eventually themes of IM. While the AOP had a general vision for IM of the entire coastal zone³, it struggled to deal with areas outside of the Commonwealth marine area (i.e. within three nautical miles of shore). Although envisaged as a ‘whole of government’ process, the AOP case study demonstrated that the policy vision articulated by senior levels of government (including the Prime Minister) was not established in a workable format for shared implementation. The South Australian Living Coast Strategy and Marine Planning Framework outlined a whole-of-Government approach to managing current and future activities within the capacity of the ecosystem whilst maintaining a healthy and productive marine, coastal and estuarine environments (Government of South Australia 2006, Day et al. 2008, Paxinos et al. 2008). The Spencer Gulf Marine Plan articulated a vision for ensuring the conservation and ecologically sustainable use of the gulf by integrating marine and land use management through partnerships between community, industry and government. Although the strategy, framework and plan were intended to involve a whole-of-Government approach it was driven by the Department of Environment and Heritage and the focus was on conservation rather than integrated management. The vision was not implemented and there is currently no shared vision for IM in South Australia’s Spencer Gulf. A shared vision for the SEQ Healthy Waterways including a long term strategy and set of over 500 actions to improve the health of the waterways was agreed early in the process. Likewise, the GHHP partners signed up to an MOU that articulated a framework including a Report Card with quadruple bottom line and 10 core design considerations early in the process. The NSW Marine Estate planning initiative included development of a management authority and expert knowledge panel to develop a vision and set of guiding principles for practical Integrated Management. There is, at this time, no shared vision for IM in the Northern Prawn fishery case study.



Sufficient legal framework – Legal and policy frameworks are typically critical to IM, and the case studies illustrate a broad spectrum of arrangements. Interestingly, the regional initiatives for Gladstone Harbour and Spencer Gulf are examples of action and progress where no legislative mandate exists – but a legal mandate and framework is assumed to be important for the longer term. The AOP case study points out that while stakeholders were familiar with a complex system of management and governance control, the pre-existing situation included too many laws and regulations that were sometimes in conflict and resulted in too much red tape. The AOP was not legislated, but was policy. Long-established arrangements in sectors (e.g. fisheries legislation) eroded and effectively disabled the AOP. There wasn’t political will for a legislative approach at that time. In 2005 the National Oceans Office placed regional marine planning under the *Environment Protection and Biodiversity Conservation Act 1999*, so it had legislative backing, but this reduced the scope to environmental outcomes. The *GBRMP Act 1975* established an independent statutory authority for IM of the GBR. That Act has been reviewed regularly and updated over the past 40 years to incorporate contemporary concepts and governance arrangements. This included a major review in 2006, which resulted in refreshing of the objectives of the Act, the listing of the Great Barrier Reef Marine Park as a matter of National Environmental Significance under the national *EPBC Act 1999*, further alignment of environmental approvals under both of those acts and a contemporary Great Barrier Reef Intergovernmental Agreement, updating the 1979 Emerald Agreement. Most recently the governance arrangements for GBRPMA were reviewed with changes occurring to split the roles of the Chairman and the Chief Executive Officer and an increase in Board membership. The Living Coast Strategy for South Australia included an

³ The first paragraph of the policy stated: “Australia’s Oceans Policy sets in place the framework for integrated and ecosystem-based planning and management for all of Australia’s marine jurisdictions”

objective of establishing a legislative and policy framework for ecologically sustainable development. However, the framework was not adopted and there is currently no legislative or policy framework for IM in South Australia, including the Spencer Gulf. The SEQ Healthy Waterways initiative sat under Queensland government legislation (SEQ Coastal Plan; Myers et al. 2012). It was recognized that there was a need to get over three levels of governance in a cooperative approach. The partnership linked diverse objectives of different councils and the Queensland State Government. GHHP partnership established an MOU that dictated the governance arrangement and how the partnership would operate. The NSW *Marine Estate Management Act 2014* and resulting policies established a threat and risk assessment framework and a Marine Estate Management Strategy. A number of parallel legislative and governance reforms also aim to coordinate previously disparate management aspects. Management to date has been issue based. In the case of Northern Prawn Management, amendments to the fisheries management act, emerging sea country claims and State-Territory-Commonwealth jurisdictional agreements under the Offshore Constitutional Settlement are all seen as moving frameworks toward IM. Harvey and Clarke (2019) conclude that the latest wave of coastal reform in Australia represents a non-uniform state-led push for a more integrated approach to coastal management including, adaptation to climate change, sustainable development, a systems-based approach to coastal processes and inclusion of both marine and terrestrial environments.



Process for effective stakeholder participation – Stakeholder participation was recognized as an essential element across case studies. The AOP process included considerable stakeholder participation. There had been considerable stakeholder engagement in previous years (especially in the south-east Australia in relation to fisheries) so many stakeholders knew each other. Some said later that they were over-consulted. But AOP was not a uniform approach, and without legislation had to rely on good will and collaboration. GBRMPA was built on a foundation of strong consultation and participatory engagement. There was widespread community support for formal governance arrangements that supported consultation and engagement. The number of players in the GBR space has increased dramatically over the past 40 years, especially since the recognition of catchment water quality and its linkages to the health of the GBR. The vision for the draft Spencer Gulf Marine Plan was to ensure the conservation and ecologically sustainable use of Spencer Gulf by integration of marine and land use management through partnerships between community, industry and government. However, the marine planning framework and draft marine plan for Spencer Gulf were not implemented and the partnerships were not established. The SGEDI involves diverse group of stakeholders and has a management board with independent chair. There is some tension around the level of government participation in SGEDI (Begg et al 2015). SEQ HWP had committees that engaged stakeholders (including broader community groups, industry and government, NGOs), scientists and politicians and was an early example of a participatory approach. The ‘culture’ or climate and key values were identified by all players and there was transparency of decisions and operations. Government, industry and community work was unified under one umbrella of the SEQ Healthy Waterways Partnership, and its pro-active stance on community involvement was identified as a critical success factor. The GHHP was driven by social license so was rooted in communication and involvement. Community members on management committees have power equal to the government and industry representatives. The NSW marine estate reform has a communication and engagement strategy and a cross-agency commitment to multi-stakeholder engagement. Stakeholder participation is recognized as key factor in the move to integrated management of NPF, but negative experience with contentious MPA processes in the past has reduced fishery stakeholder appetite for IM.



Comprehensive objectives – The move to integrated management is entwined explicitly with the need to achieve a diverse set of objectives (or to obtain a suite of values) across activities. The AOP had a comprehensive suite of objectives but could not implement it. GBRMPA has had clear objectives and outcomes across a suite of values for managing a multiple use marine park, and that scope has been

expanding over time. The objectives are nested in both the Act, the zoning plan (e.g. environment, biodiversity, and heritage values with sustainable uses within that context) and most recently in the Reef2050 Long-term Sustainability Plan. The draft Spencer Gulf Marine Plan grouped habitats and species into four ecologically rated zones with defined goals, objectives and strategies. A performance assessment system was established to evaluate the effectiveness of the plan by reporting on the condition of the ecosystem. The marine planning process was meant to complement the process for establishing marine protected areas in South Australia. However, the approach was not adopted. A project co-funded by the Goyder Institute for Water Resources, FRDC and SGEDI is currently underway to establish a suite of potential comprehensive objectives for the Spencer Gulf (Tanner et al. in prep). The SEQ HWP report card integrated clear objectives related to diverse aspects including ecosystem health, community values, access, and economic benefit. Likewise, the GHHP used a report card to report on a quadruple bottom line of cultural, social, economic and environmental objectives. The NSW Marine Estate Management Strategy has nine defined initiatives that address environmental, social, cultural and economic objectives that were prioritized through a multi-sectoral and triple bottom line threat and risk assessment (Gollan et al. 2019). Most sector plans of the NPF recognise triple bottom line within their own plans, but there is no recognition to date of the interaction among plans. Current NPF co-management itself addresses a major social objective, and some other social aspects are included in existing objectives. It is recognised that objectives are not defined in the same way across sectors/plans. Further development of objectives is seen as a productive pathway toward IM.



Consideration of trade-offs and cumulative impacts – The need to resolve (or at least to articulate) trade-offs and to address the cumulative impacts of multiple activities are among the most critical missing aspects of current management and among the most compelling reasons for moving to IM (Stephenson et al. 2019). Interestingly, the attention to trade-offs and cumulative impacts, was variable in the case studies. The AOP was explicitly proposed to consider trade-offs, but it had no actual mechanisms to do so. Although overall it failed to achieve this for a variety of reasons, some significant trade-offs were addressed as a result of engagement and negotiation, and were taken up by individual sector management mechanisms. The AOP case study underlines that major trade-offs with ongoing financial implications are mostly political decisions. Within the multiple use context of the GBRMP, trade-offs have been a feature of management arrangements to ensure uses are managed to avoid conflicts to the extent possible. Cumulative impacts are addressed largely through planning exercises within the GBRMP. The focus of draft Spencer Gulf Marine Plan was on conservation and there was limited consideration of trade-offs and cumulative impacts. SGEDI has funded an ecological risk assessment (Doubleday et al. 2018) and preliminary assessment of spatial cumulative impacts in the Spencer Gulf (Jones et al 2018). SEQ HWP was instituted with the idea of providing reports on cumulative impacts through report cards. A CSIRO study in 2010 (Dutra et al. 2010) considered the addition of specific analysis of trade-offs in SEQ HWP evaluations, but that was not implemented. Similarly, GHHP was driven by concern over cumulative impacts, and attempted to report on those in report cards, but there has been no explicit consideration of trade-offs in annual reporting, though it has been considered in model-based scenario projection exercises. The NSW marine estate threat and risk assessment approach provides information that allowed consideration of trade-offs during the development of management actions, and a specific evaluation framework has been developed to provide guidelines to support this process. Current research is aimed at developing a framework for cumulative impacts. In the NPF assessment, studies on the potential water development plans in a few large watersheds have specifically analysed the likely trade-offs between water extraction (and agriculture production) and the loss of prawns, but interactions are not well understood and further consideration is required.



Flexibility to adapt – All case studies show that circumstances evolve and that an IM process must be able to adapt. The AOP process was flexible to start, but became more rigid as it became ground down under the weight of processes (ultimately contributing to its dissolution). GBRMPA was designed to be adaptive with regular reviews built into the design, and claims to have been a successful application of ‘adaptive management’. The case study review noted that rapid climate change may be overtaking GBRMPA’s ability to respond/adapt. SEQ HWP has been characterized as a ‘change management’ process with appropriate structures and processes to deal with changing partnerships and changes in funding. The Marine Planning Framework for South Australia also included the principle of adaptive management and recognised the need to adapt to changing conditions and improved knowledge; (Government of South Australia 2006a, Day et al. 2008, Paxinos et al. 2008). GHHP is an open partnership that has evolved in composition and process (e.g. adaptation of the report card) with changing conditions. The 10-year NSW Strategy that commenced in mid-2018 has management actions that are rolled out through a staged approach to ensure effective implementation and adaptation. There is also a scheduled review after 5 years to evaluate the success of management and adapt if required. The NPF and its co-management industry group (NPF Industry Ltd) have shown over the last few decades considerable flexibility and industry has led initiatives like bycatch reduction and interacted positively in processes of change (including the introduction of MPAs, Environmental Risk Assessments, and international sustainable fishing certification via the Marine Stewardship Council). Further, this fishery (like others) is actively trying to adapt to climate change, including for example changes in harvest strategies for banana prawn and mangrove die-backs.



Established process for review – The AOP had a planned process for review, and an external evaluation was undertaken in 2002. The AOP process did not continue long enough to see if the established process for review could have helped the process adapt. Since 2009 GBRMPA has through statutory requirements produced an Outlook for the Region every five years (2009, 2014, 2019). It also has international obligations for reporting on reef status through World Heritage State Party reporting, coordinated by the Department of the Environment and Energy. Outlook reporting is a good example of transparent monitoring, evaluation and reporting and is recognised internationally as best practice. There is also a requirement to review the GBRMP Regulations every 10 years. The most recent review resulted in contemporary regulations coming into effect on 1 April 2019. SEQ HWP had an established process for review, but that changed due to changing partners and the disbanding of the various expert science panels which was triggered by a change in the level of government support (that affected funding and resourcing). GHHP’s emphasis on social licence has resulted in ongoing review. While some of the review is issue based, there was a review of the Gladstone Report Card in 2017 and an independent review of GHHP governance in 2018. The NSW Strategy has specific actions related to review and performance evaluation, which will be carried out as part of the five-year health check. The process will be informed through a structured Marine Integrated Monitoring Program (MIMP) that will measure and report on evaluating the effectiveness of the management initiatives and actions, and the progress towards achieving key performance indicators to guide adaptive management as well as fill knowledge gaps. The NPF has an established process for ongoing review in the form of a standing resource assessment group (NPRAG) and a management advisory committee that meet at least twice a year.



Effective resourcing, capacity and tools – Effective resourcing is critical to any management process, and the aspects of resourcing, capacity and tools are diverse. The AOP was relatively well resourced. It involved plenty of experienced people working in relevant jurisdictions. But the staff were stretched thinly in relation to the magnitude of the scope of the AOP and the fact that it was a new, undefined process. Achieving a

‘whole of government’ approach was complex and difficult, and this was not helped by the National Oceans office being located outside of Canberra. GBRMPA is relatively well resourced, but the funding is not commensurate with fully addressing all of the issues, and the window for addressing some issues is getting smaller. The investment framework for the Reef2050 Plan shows that across governments, industry and the community, more than \$1.2 billion has already been committed for the next five years focused solely on delivering actions in the Reef 2050 Plan. For the Australian and Queensland governments, the Framework will be used to channel new investment toward identified priorities and to inform the use of regulatory and policy levers that, along with investment, are critical tools to support the achievement of these priorities. For the private sector, the framework identifies partnership opportunities and strategies for their involvement. The Marine Planning Framework for South Australia was not implemented or resourced. Demonstration decision-support tools to support integrated management have been developed through a range of projects funded by SGEDI (Gillanders et al. 2016), FRDC and the Goyder Institute for Water Research (Bailleul and Ward, 2018). The SEQ HWP initiative had sufficient resourcing for over a decade, but substantial reduction in State government funding has forced major changes in the partnership. GHHP has been able to compile sufficient funding to service high-priority needs from government and high value partners and to engage capacity for research on critical issues but the voluntary nature of the agreement may yet present challenges as investment interests or the economy shifts. The NSW marine estate reform process has been resourced through existing MEMA agencies to allow delivery of the MEM Strategy, with new government investment into a staged implementation of the identified management actions in the Strategy, including \$45.7 million over the first two years (Stage 1). In the case of the NPF, to date there has been research funding only, but as the issues and potential conflicts are progressed, additional resources will be needed, including for a regional forum process

The phases of implementation of IM

Following the workshops, the major results from the case studies related to the phases of integrated management were collated and compared.



Preconditions and drivers of change – The seven case studies illustrate diverse preconditions and drivers for change. At the time of the AOP, government was facing structural adjustment in fisheries, especially in the Southeast of Australia, to ensure economic and social objectives. The Resource Assessment Commission (1993) took an expansive view of the coast that implied the need to integrate institutions, and the Offshore Constitutional Settlement (1979) provided title to the coastal seabed. GBRMPA had successfully provided experience in more integrated planning (zoning) in relation to an internationally recognized iconic feature at the scale of an ecosystem. Australia was just the second nation in the world to recognize the need for an integrated approach to oceans management (IM) in a national policy (AOP, 1998), which was part of the commitment to UNCED. Recognition of the need for preservation and sustainable use of South Australia’s coastal, estuarine and marine environments drove the establishment of the Living Coast Strategy (Government of South Australia 2004), Marine Planning Framework (Government of South Australia 2006a,b; Day et al. 2008, Paxinos et al. 2008) and draft Spencer Gulf Marine Plan (Government of South Australia 2006b). Urbanised areas such as SEQ and especially Gladstone Harbour were growing rapidly, with decreasing ecosystem services. The footprint of industry and urbanisation was increasing, leading to unacceptable environmental events and human health concerns. There was increasing recognition of the linkages between effective management, healthy fisheries and good water quality, and economic values. Governments were realizing the need to work across jurisdictions on problems. Public and non-governmental organisations (eNGO’s) were increasingly weighing in on resource management. At the same time, industries were becoming increasingly aware of image and public perception of their activities (now

known as Social Licence to Operate). Most jurisdictions are increasingly wrestling with attempts to implement Marine Protected Areas/Marine Parks, the need to manage the coastal zone in a unified way (e.g. NSW Marine Estate), and the need to plan effectively in relation to the conflicts and trade-offs of proposed new developments (e.g. Spencer Gulf, Northern Prawn fishery considerations).



Intentional design – The seven case studies represent a spectrum of approaches to IM design. AOP was an attempt to implement a national IM framework. While it had a clearly articulated vision, it failed in the architecture of implementation. GBRMPA is a plan for management of an iconic area that has evolved from a zoning process to an integrated management plan over more than four decades. It has a shared vision for monitoring and protection that has been supported by legislative amendments, has ongoing shared funding arrangements and is widely accepted. The Living Coast Strategy (Government of South Australia 2004), Marine Planning Framework (Government of South Australia 2006a, Day et al. 2008) and draft Spencer Gulf Marine Plan (Government of South Australia 2006b; Paxinos et al. 2008) were specifically designed to preserve coastal, estuarine and marine environments providing a sustainable base for fishing, tourism and recreation. The ongoing Spencer Gulf initiative is an attempt at integrated planning for future development and avoidance of conflicts in a major coastal area of South Australia. SEQ HWP developed a strategy under Queensland government legislation that links local Councils in voluntary partnership with shared objectives of jointly improving waterways ecological health and, in turn, water quality. GHHP is a stakeholder-driven collaboration to improve management outcomes and avoid problems in one of Australia’s busiest harbours. NSW marine estate reforms are an emerging attempt at comprehensive governance rearrangement of all managed activities in the coastal zone of NSW, in order to identify and reduce the major threats to the environmental, social, cultural and economic values of the estate. The case study of Northern Prawn Fisheries management is an anticipatory scan of what is in place and what would have to evolve in order to deal effectively with emerging integrated management issues. There is recognition that the design of the IM initiative is critical to its ultimate success or failure.



Enablers/barriers to change – Integrated Management requires change, and the case studies show evidence of diverse enablers and barriers in the move to Integrated Management. Some of these factors are matters of context and are related to the drivers of change. The political desire to get the Gladstone Harbour off the front pages of newspapers and to obtain Social Licence to Operate, for example, were strong enablers for GHHP. International pressure such as the World Heritage Committee’s interest in GBR, or commitment to UNCED in the case of AOP, can enable IM initiatives. There are also the unplanned (either positive or negative) consequences of a change in government. The Marine Planning Framework for South Australia was meant to complement the process for establishing marine protected areas. It was intended to involve a whole-of-Government approach, but instead of being established under a marine planning framework, marine parks were implemented in South Australia by the Department of Environment and Heritage. There was considerable opposition to the establishment of marine parks from some stakeholders, especially commercial and recreational fishers.

The case studies show, clearly, the positive impact of individual political leaders or champions (e.g. Lord Mayor of Brisbane in the case of SEQ HWP), as well as of key participants ranging from industry members, to scientists and NGO’s, but also the negative consequences that can result from differences of influence or power among participants (e.g. the oil and gas industry in the case of AOP). Other enablers included combined capacities of diverse stakeholders, good quality science, technological advances (including improved communication technologies), and emerging trends such as interest in the possibility of a ‘blue economy’. The case studies provide strong evidence of diverse additional disablers including suspicion and

lack of trust among participants, variability in leaders and leadership styles, awkward (complex) and ineffective bureaucratic structures, political ‘end runs’ by participants to political figures, and changing circumstances (such as the drop in iron ore prices that reduced urgency for IM in Spencer Gulf). The effectiveness of stakeholder participation seems critical, as stakeholders can embrace and enable IM through positive participation, or can undermine IM attempts. Sectors differ greatly in scale (including number of participants, economic value and perceived influence in management) and that difference may contribute negatively to the enthusiasm and ability to contribute to IM. For example, while the contribution of the NPF to the economy is substantial, it is considered to be a relatively minor contribution in comparison with agriculture.



Features of the resultant IM – The case studies differ in attention to the proposed nine key features of IM. In most cases the implemented process had deficiencies that became apparent over time due either to insufficient attention to structure and function at the start, or to changes in participants of political context during the process. In all cases there was recognition of the need, although in the case of the AOP, there was lack of shared ownership of the process or consensus on what IM should be. The vision for IM differed among case studies. While the initial zoning of the GBR was as a marine park with marine spatial plans there was always recognition of multiple uses (e.g. significant commercial fishing activity) but it is fair to say it evolved into Integrated Management.

An area of considerable difference among the case studies was that of legal and institutional framework. Despite an extensive planning process IM has not been adopted in South Australia, largely due to lack of support for the approach within key government agencies (Begg et al. 2015). GHHP and SEQ HWP were voluntary initiatives that engaged diverse participants in attempts to improve performance, whereas AOP (historically) and the recent NSW marine estate reforms were attempts to provide legislation and/or policies that aims to provide for a coordinated, transparent and evidence-based approach to integrated management. All case studies emphasized the importance of sufficient and effective process for stakeholder participation. Modern management is explicitly objective-based, and there was general evidence for the need to achieve a greater set of objectives (for example a ‘triple bottom line’), but the specifics of that differed across cases. Consideration of trade-offs and cumulative impacts were seen as important, but to date these have not been addressed comprehensively in any of the case studies. Resourcing, capacity and tools differed among case studies, but remained an issue in all cases. Newly implemented IM requires resourcing commensurate with diverse needs of a new and complex process. New and different information will require new skillsets and tools. There is a need for both ‘policy capacity’ and institutional capacity’ (Vince and Nursey-Bray 2016).



Evaluation of success, review and improvement – We emphasize that review, evaluation and adjustment/improvement is required for the viability of an ongoing process. Most case studies recognized the importance of flexibility to adapt to changing conditions and the need for ongoing review and refinement, but differed in the degree to which this was implemented. This is particularly true in those case studies that have been long-lived and able to adapt, especially GBR marine planning which has evolved through spatial planning to IM. The Marine Planning Framework for South Australia recognised the need to adapt to changing conditions and improved knowledge; (Government of South Australia 2006a). As part of the 5-yearly Outlook Reporting cycle, GBRPMA commissions an independent assessment of management effectiveness of its and others’ management arrangements.

Discussion

The need for integration of management in relation to diverse marine activities is obvious and is increasing. Without integration, management suffers from the inconsistencies that occur with different groups managing different activities in different ways, from conflicts of overlapping or competing activities, and there is no ability to consider the cumulative impacts of multiple activities. Further, and increasingly important, some form of integration of management will be required to deal effectively with climate change.

This study tested a framework proposed by Stephenson et al. (2019) as a tool in evaluating seven Australian Integrated Management case studies. Workshop participants found the framework to be a useful evaluative lens. It is considered to be comprehensive in relation to both the key features and major phases of implementation of IM.

The seven case studies considered in this project represent a broad spectrum of forms and degree of integrated management. While the attempt to implement widespread IM in the AOP was not successful (due in part to the fact that it was so widespread, and to a lack of a framework and tools to support the process), there are more recent or ongoing initiatives that have had at least partial or temporary success in implementation. The Great Barrier Reef Marine Park management arrangement is a long-standing process that has evolved through spatial planning to IM. The SEQ HWP and Gladstone Harbour initiatives were established to overcome problems (crises) that were not being addressed (or able to be addressed) by management of individual activities. The New South Wales case study is a modern attempt to reform governance and management in a ‘whole of Government’ approach. The evolving Spencer Gulf planning is an attempt to put in place an integrated framework to guide anticipated future development without compromising existing activities and ecosystem services. Finally, the Northern Prawn case study offers a perspective of the potential path of activity-based planning in an area in which interactions with other activities are increasing.

The nine features are all important, and the five phases seem to have been relevant in all case studies. IM will not occur without recognition of need, but that ‘need’ can come from different circumstances. Australia has a general recognition of the need for IM, but that recognition of need was not sufficient to ensure success of the AOP. There is no question of the need for establishment of a value proposition for the effort of IM. We note that management crisis, or perceived failure, was a prime motivation for action in several case studies, and makes the need more compelling and urgent than governmental perceptions that it is the right thing to do. While IM may not be required in all situations, we predict it will be increasingly needed as a result of increasing use of coastal marine space, a growing emphasis on blue economy, and changing coastal uses due to climate change.

The vision of IM differed among case studies. We suggest that a common vision based on the framework discussed in this report will assist in implementing viable IM in future situations. We note that IM may take time to develop, especially to bring institutional and stakeholder partners to a common understanding and purpose for the IM. A key feature of the framework is to link and influence existing sector-based plans, so that it builds on existing management. The framework provides both a recipe for implementing IM (including both key features and a progression of phases) and a lens for subsequent evaluation of the resulting IM process.

The case studies reveal the complexity surrounding the legal (and management) framework for IM. While Australia has a body of policy intended to enable IM, the complexity of legislative, policy and existing management arrangements pose a substantial challenge for implementing successful IM. Reference has often been made of the need for a ‘whole of government’ approach, but that has proven difficult to achieve, especially among multiple jurisdictions (e.g. AOP). Australia has diverse existing activity/sector-based management structures, and IM requires some rearrangement or modification of those. Achieving an appropriate and effective management (re)arrangement remains arguably the greatest challenge to implementing IM. The framework discussed in this report is practical, in that it builds upon (rather than

replacing) existing plans. It may be made even more tractable by focusing on points of intersection or cumulative impacts of multiple sectors (e.g. Smith et al. 2017) rather than trying to be all encompassing and take over every aspect of the management and development of Australia's marine estate.

Effective stakeholder participation is widely accepted as an important element of IM, and Australia has had considerable experience in stakeholder involvement in existing management that can be drawn on and enhanced for functional IM. It is noted that there is a trend toward more effective stakeholder participation in existing sector-based management, and the participation in IM regimes is seen as a logical extension of that sort of consideration.

Consideration of a more comprehensive set of objectives, trade-offs and cumulative impacts, seem to have evolved quite naturally as a topic of interest in the IM case studies. However, there has been insufficient practical implementation of these aspects. We suggest that establishment of an appropriate IM structure, with the authority and mandate to create IM will result in use of a more comprehensive set of objectives and the development of methods for consideration of trade-offs and cumulative impacts. The GBRMP experience is of direct relevance here, showing how management for one purpose can adapt through time to consider more cumulative components. Similar motivations are driving the NPF case study.

Regular review and the flexibility to adapt are essential if an IM arrangement is to persist. This recognizes the fact that circumstances change, and that some form of dynamic management is required. The GBR management initiative for example, has changed over time and has evolved into what would be recognized as an IM initiative. GHHA and SEQ HWP have also had to evolve over time in response to changing conditions. The coordination, or integration, of management of diverse activities to overcome the current uncoordinated and independent approach to sector-based management that exists in most places, requires a strategic, coordinated and ongoing approach to review across marine and coastal zones looking at multiple impacts on values.

IM represents a fundamental change in management. While our vision builds on existing management, it requires additional participation and considerations. It can be expected that IM initiatives will require new resources, development of new tools, and increased capacity of government and other participants. IM initiatives must be resourced properly if they are to succeed.

Although the general concept for IM has been around for many years, there have been very few examples of successful and long-term implementation. This has been due in part because of lack of a common vision and recipe for implementation. We suggest that the framework or vision presented in this report is an appropriate candidate vision and recipe for successful IM. The framework builds on existing management, and therefore represents incremental change. It prescribes nine key features and five important phases of implementation that we suggest are relevant in all cases. Use of this framework should result in successful IM and should overcome the key common failings of existing sector-based management.

Of the key features of IM, it seems the critical aspect is development of appropriate governance structures that will bring together the various relevant sectors and management agencies and empower a group to be able to proceed with IM. That aspect requires further research. Future IM initiatives will quickly see the need for tools to assist in a) evaluation and management of trade-offs, and b) evaluation of cumulative impacts of multiple activities. Anticipatory research on how those two aspects could be addressed in an IM framework is important.

Recommendations

We make the following recommendations based on this project:

R1 – We recommend consideration of the vision articulated in Fig 1 as a candidate model for Integrated Management. That model builds on existing management, articulates the critical features of IM and explicitly overcomes major deficiencies of current sector-based management.

R2 – We recommend inclusion of the nine key features articulated in the project (Fig 2) as a recipe for ‘best practice’ in implementation of all future IM projects.

R3 – We propose consideration of the five phases articulated in this study (Fig 2) when implementing future IM initiatives.

R4 – We recommend use of the lens (with nine features and five phases; Fig 2) as an evaluative tool for IM initiatives.

Further development

R5 – We recommend further investigation of the development of appropriate governance structures that will bring together the various relevant sectors and management agencies and empower a group to be able to proceed with IM.

R6 – We recommend that this framework be used to implement Integrated Management either in collaboration with ongoing reform by management agencies or as a holistically designed Integrated Management application.

R7 – We recommend further development of tools to assist in a) evaluation and management of trade-offs, and b) evaluation of cumulative impacts of multiple activities.

Extension and Adoption

A description of the IM framework discussed in this report has been published (Stephenson et al. 2019, Ocean and Coastal Management. <https://doi.org/10.1016/j.ocecoaman.2019.04.008>) and the results of the workshops will be written up and submitted for publication.

This report will be distributed to, and discussed with, relevant management bodies and agencies. Interest has already been expressed, by some jurisdictions, in applying the framework to guide emerging case studies of IM (including efforts to facilitate an application of Integrated Ecosystem Assessment approaches to at least 2 Australian regional areas).

The Projects Team will write a factsheet highlighting major results.

Appendices

Appendix 1 - Participants

Workshop #1 (Hobart, March 27/28, 2018)

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Catriona Macleod, Centre for Marine Socioecology, Hobart, Australia.

Robert Stephenson, Fisheries and Oceans Canada and visiting researcher CSIRO, Oceans and Atmosphere, Hobart, Australia and Centre for Marine Socioecology, Hobart, Australia

Workshop #2 (Brisbane, April 9/10, 2018)

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Appendix 3a – Australia’s Oceans Policy.

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
<p>Recognition of the need for IM</p>	<p>-Australia was 2nd in the world to recognise integrated approach to oceans management (Part of commitment to UNCED). -Explicit recognition of integration as an aspiration of AOP from Prime Minister. -Lot of other things happening in coastal policies, Resource Assessment Commission took an expansive view of the coast, there was also the GBRMPA experience of integrated institutions, and Offshore Constitutional Settlement. -SE Fisheries was a big driver, it had been substantially over allocated and required a large structural adjustment and intervention by Government to deal with the potential failure of Australia’s largest fisheries, which would bring extensive economic and social impacts. -Offshore Constitutional Settlement: no one wanted to overturn this, there was clear jurisdictional bounds and everything fell from this. It gave clarity about roles and responsibilities but also brought constraints. It became the context for all the issues, but the states were suspicious of the national government.</p>	<p>-There was definitely intentional design, e.g. a series of working groups to develop AOP -Informed by the Canadian experience of the Oceans Act. Decided against a legislative approach based on Canadian experience, thus it was always going to be a policy route. -The intentional design problem was that the AOP was a vision with not much else. It failed on the architecture.</p>	<p>-It was targeted as an environmental issue rather than a broader issue (which was a constraint). -Widely held as positive by academics, policy actors, and key politicians. -Held a big workshop to look at all the issues (SE Region). -Sectors were protective of their turf. There was a lot of work to bring the stakeholders together, but suspicions remained between State players and Federal. -International recognition in policy domain, International year of the ocean, UNCED 1992, climate change initiatives IPCC work, coasts & climate, raised political profile, but maybe not social. -The major ENGOS were on board, as were key peak bodies. -Needed to bring in SE Tas & NW, where there were conflicts, but at the same time the SE region was possibly the worst place to try to put in initial efforts around an IM process (because of the tension and conflicts – it was in need but the cohesion required for early steps to succeed were ultimately not there). AOP meant different things to different people.</p>	<p>-AOP administered by new National Oceans Office (NOO) - AOP was a joined-up approach of all management agencies to work together under a set of common governance arrangements. It collated into a single planning framework a complex of disparate laws and regulations that were sometimes in conflict.</p>	<p>Partial success: Australia was recognised for success (internationally) Good things: clearly articulated vision and there was really good consultation Weaknesses: there were structural constraints. -Different expectations for what planning meant – it didn’t end up as a plan in the way that people expected it. -Incomplete acceptance by jurisdictions (5 of 8) -One of the key people involved in the implementation of the (SEBR) Plan passed away about 6 months before the work could get done. This undermined the small NOO team, and demonstrated the lack of system and resilience in the architecture for implementation.</p>

<p>A shared vision for IM</p>	<p>-A decade of very strong collaboration across jurisdictions preceded the AOP. -Widespread agreement that something was needed, but each player more or less had a vision that wasn't shared – disparate visions existed simultaneously.</p>	<p>-AOP was designed for collaboration -There was a clearly articulated vision in that document from the PM, Minister and down It was also referable to international policy directions and so had traction. -Explicit statements in the policy document that described IM. -The vision and debate prior to this was translated into the AOP doc and included sectoral measures. -Negative feature: vision for IM wasn't clear as to whether it involved the whole coastal zone of just the commonwealth waters -Whole of government process identified in policy</p>	<p>-Major stakeholders directly approached the Minister questioning the process (i.e. negative for AOP) -Huge body of work and documentation.</p>		<p>SUCCESS: Bits and pieces of the AOP design were used in different later documents SUCCESS: AOP did bring a vision together and had political will PARTIAL: Mixed view of it, not everyone was brought in, but realistically it is incredibly difficult (if not impossible) to achieve something that everybody agrees with. But AOP was still a success. The design is still very sound. It was the other things (i.e. implementation) that prevented its success long term – e.g. management regarded as best practice at the time. Evidence: Minister gave international speeches on it.</p>
<p>Appropriate legal and institutional frameworks for coordinated IM decision-making</p>	<p>-Australia had a whole suite of law & policies pre-existing. - Australia was used to management and governance control, policy and stakeholders were familiar with laws and regulations around governance. This wasn't the case in most other places. -There were too many laws and regulations and they were sometimes in conflict, with disparate responses, and it was not possible for a single body to step back and reform the entirety in one go (everything was too interwoven). There was too much "red tape", some no longer fit for purpose (i.e. out of date), but still in place as law.</p>	<p>-AOP was not legislated, it was policy. Hotly debated by academics, some argue it should have been legislated, but it wasn't legislated because it would not have passed (as there wasn't the political will for legislative approach). -1999 EPBC Act was implemented as the instrument, to facilitate the AOP but it could not provide a legislative anchor equivalent to a dedicated act (and the EPBC Act didn't get triggered until 2001, part way into the AOP process) -2000-05 NOO developed a process to use the policy arrangements -2005 – NOO pushed regional marine planning under the EPBC Act so that it had a</p>	<p>-Political capability and power/leadership – initially strong support, then diminished. -Unclear role and lack of a "stick" for the NOO meant AOP could not enforce anything. -The existing framework of laws and regulations disabled the AOP and NOO because each sector had long-established arrangements, e.g. fisheries legislation of the time was designed with fisheries catch in mind not sustainability more broadly.</p>	<p>-Had some successes in advancing a broader view of IM within single sector management, but ultimately was closed down as it had devolved to regional planning reduced in scope to environmental matters only under the <i>EPBC Act</i>. While this did mean that marine planning had legislative backing, it was reduced in scope to only environmental outcomes relevant to the Commonwealth government.</p>	<p>Partial success Negative: Wasn't a uniform government approach – AOP without legislation had to rely on goodwill and collaboration. Positive: Environmental domain, basis for MPAs And Bioregional Marine Plans Positive: introduced IM to other sectors.</p>

		legislative backing, but this reduced scope to only the environmental outcomes. It was that or nothing because of the changed political context.			
Sufficient and effective process for appropriate stakeholder consultation, engagement and participation	<ul style="list-style-type: none"> -Lot of engagement in SE fisheries for 5 years before AOP -Willingness amongst stakeholders, because people didn't want to miss out -A lot of the players knew each other, e.g. oil and gas knew the ENGOS and fisheries, they were used to working together. The Ecologically Sustainable Development working groups had 2 years of collaboration previously. -Lots of stakeholders felt they weren't being heard in the previous oceans governance processes. -Previous processes had marginalised or ignored many stakeholders. -It's only where there is stakeholder conflict that you really need IM. 	<ul style="list-style-type: none"> -Plenty of resources to drive the engagement processes. -Lots of participatory processes - many later said they were over consulted, especially stakeholders and smaller industries. -There were 5 sub-processes, because of the scale, so it had to be separated it into chunks. - Independent advisory committees 	<ul style="list-style-type: none"> -Policy was designed to bring disenfranchised stakeholders on board. -Wasn't able to hold all stakeholders to the same degree. It was running on several tracks, non-environment portfolios weren't held to it (e.g. case oil and gas industry weren't really held accountable to it). Constraint: lack of buy-in from non-environmental areas. -Constraint: a lack of agreement/definition on state and territory waters. 	<ul style="list-style-type: none"> -There was considerable effort devoted to engagement (though some stakeholders referred to being "over-consulted") in a consensus-based process, and key stakeholders understood what the AOP framework was trying to accomplish, but there was a lack of broader community buy-in and the initiative eventually lost support from key sectors and became bogged down in process. 	<ul style="list-style-type: none"> -An evaluation report is available - Partial success: -Positive in the sense that stakeholders understood what the AOP framework was about -Positive in that if people from the key sectors weren't heard it wasn't because they hadn't been consulted -Negative in that the process wasn't agreed to by all parts of government, there were sector undercurrents that were pulling it down. -Negative – didn't get the broader community involved. They didn't have ownership or connection to the policy or consultation process -In the end there was limited buy-in from Canberra and non-environmental sectors. (lot of effort to try to get it through but they ran into insurmountable barriers)
A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.		<ul style="list-style-type: none"> -Policy documents did attempt to integrate objectives. It had 2 parts to it, the AOP was a set of principles & objectives, but it didn't have a clearly identified process for how to achieve it or link it together -Brought together components from each sector via some careful design work that wove it together. -It was intentionally designed for consensus, but became far too complicated by trying to 	<ul style="list-style-type: none"> -It was a consensus driven process, this became a 'disenabler', it was a lofty ideal but it takes a long time. - IM has to be done in a focused and parsimonious way -Lack of clearly identified process to achieve this The design was so complicated that people couldn't understand it. And some sectors didn't want to. -There were champions in each sector who did take on a 	<ul style="list-style-type: none"> -The AOP had a comprehensive set of principles and objectives, but no clear process of how to link objectives together. It tried to include diverse aspects of management, including things that could have just been dealt with by existing sectoral management. By trying to be comprehensive in considerations and to achieve consensus, the AOP became too complicated and could 	<ul style="list-style-type: none"> Partial success: There were clear documents and a good suite of objectives, but implementation efforts failed. Negative: strong sectoral influences pervading, NOO didn't have complete control over all parts of government Negative: ENGOS were critical, they wanted more -Achieved only 1 of the 5 intended plans: SE plan only covered a fifth of Australia. -Accelerated a uniform

		be comprehensive.	larger than fair share role, NOAG	not take action in relation to the objectives.	approach to IM in every fishery in 2 years. Saw substantial change with significant advances toward IM, but led by individual sectors
Explicit consideration of trade-offs and cumulative impacts of multiple activities	-Recognised as a problem, but no process There is one appointed body that does this, Cabinet, for important political decisions	-AOP was designed to do deliver trade-offs	Negative: The policy recognised there were going to be trade-offs, but nobody knew how this was going to play out -Sectors were stronger than policy and there was no mechanism to overcome that. NOO was full of committed but inexperienced people, who were up against very experienced, savvy and established public servants; AOP status was ephemeral.	-While the AOP did not explicitly mention trade-offs this was widely considered by stakeholders as a key objective and the AOP processes contributed positively to understanding of issues among diverse participants, but failed to implement a framework for explicit consideration of trade-offs or of cumulative effects.	-It failed to achieve this. But the outcome was achieved through non-explicit processes e.g. in most cases, through engagement and negotiation - Aimed for consensus – but thus took too long; more success was achieved via engagement with (multiple) specific sectors to solve specific issues
Process flexibility to adapt to changing conditions.	As a policy, rather than legislation, it could have been changed.		Negative: The consultative process wore down the champions over time ENABLER: Executive agency model allowed this to happen, there were governance structures to allow it to be flexible but being a junior agency it was quickly cut down - by 2005 it became a Branch of the Department of Environment	-The AOP was flexible at first, but after 2005 became more rigid and became bogged down under the weight of its processes. There were planned processes for evaluation, and the first (2002) evaluation was outsourced. AOP failed to complete all of its anticipated objectives in the first 5 years.	-Successful initially at least in the first 5 years. After 2005 - it became more rigid as it became mired in a weighty set of processes -Managing expectations was important but the NOO had trouble doing this, so busy. Couldn't get the Govt to agree to release the marine parks at the same time as the SE plan, which dealt with a lot of trade-offs, but didn't deal with conservation. It wasn't the framework that under delivered, it was an implementation failure.
Process for ongoing review, evaluation and refinement	Explicit within the AOP, it was time-bound. Budgetary accountability because of the investment.	SEMRP had timeframe set into it. But delivery times came & went. The department even prepared an evaluation in case of any enquiries, though no such request ever came. The other 4 processes were modified into the Marine Bioregional Planning process	Negative: A tranche of 2 or 3 years of start-up money, 3 years of program, by that stage was held in poor regard and put on drip funding. NOO wasn't able to secure long term funding, so on an annual funding cycle so wasn't able to put in place to support the refinement of the process		There were planned processes for evaluation, and ad hoc focused reviews as questions arose Failed because the AOP died. The reasons for this failure are tied back to #1, but there was also not enough recognition that enough integration was in existence.

<p>Effective resourcing, capacity and tools</p>	<p>-Capacity: Plenty of people working in management in all the jurisdictions, well-educated policy class and scientists and academics, experience and knowledge – at levels that some other countries did not have. -Didn't have the tools needed to implement the policy. The people involved in implementation didn't know how to do it. There are tools for fisheries management and conservation management and water quality but not for IM. Had insufficient idea of how to do it. -Lack of data, biophysical environment and conditions were unknown, for many areas.</p>	<p>under the EPBC Act</p> <p>-Well-resourced financially Lots of people (knowledge and skills)</p>	<p>-Some aspects seemed hypothetical, so stakeholders were defensive -Not a clear design around the state and territory waters. -Choice of leadership was important. -There were champions in each sector who did take on a larger role. -Once Senator Hill left the institutional driver disappeared -NOO failed because it wasn't located in Canberra - this proved to be a negative, it needed to have people all over the country – if the right group of people were involved and had there been buy-in from Canberra it might have worked, but the opposite was the reality. It was commonwealth-led</p>	<p>-The AOP had considerable capacity in terms of people in diverse jurisdictions with experience of management, science and academia. However, the task of national planning was large, and it became complicated by dealing with multi-jurisdictional issues which became difficult to navigate in terms of who was responsible for delivery of outcomes. It also suffered from being a novel undertaking across jurisdictions so that it was a process of learning as well as of plan development. Timelines slipped and the initiative eventually stalled.</p>	<p>Partial success: Did do some good work, delivered the South East Regional Marine Plan (tool). SE had far more invested in it than any other region. There were insufficient people to do the job, they were stretched thin no one had done this before, the Plan was a process of learning more than a plan. Whole of government approach (institutional capacity) added another layer of difficulty. There was a lot of innovation going on but those involved can't talk about it because of Cabinet level discussions. We didn't know what we needed – Every time we started something, more was revealed about what was needed.</p>
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Appendix 3b – Great Barrier Reef Marine Park management arrangement.

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
Recognition of the need for IM	<ul style="list-style-type: none"> - Iconic status of GBR (national identify and international profile) -The need to manage a unique and important natural feature in relation to diverse values and increasing human uses has been recognised for many years. - suite of values that the GBR supports (economic, social well-being, etc. - World Heritage list since 1981. World Heritage committee concerns about cumulative impacts - Extreme weather events - Mass coral bleaching (2015/2016) - Organisational name stability (GBRMPA can't change its name) 	<ul style="list-style-type: none"> - 25 year Strategic Plan (1994) - Outlook Report (2009, 2014) - Strategic Assessment 2014 	<ul style="list-style-type: none"> - GBR listed as World Heritage Area in 1981 - Leadership styles - comprehensive foundational management for catchment and GBR marine park - existing relationships - (barrier) scale of reef, change, diversity of interests, etc. - (barrier) trying to communicate complexity of history and sophistication of management system. 	<ul style="list-style-type: none"> - Driver / Impact / State/Pressure/Response model and the ways it incorporated human dimensions -Increased political profile especially international -Dedicated focus in Department of Environment and Energy and Dept Environment in Science/Office of the GBR 	<ul style="list-style-type: none"> -Has been success: Building on a firm foundation: complementary zoning; Traditional Owner and stakeholder engagement; joint field management; - joint permits -Evaluated through multiple reviews including: Multiple reviews of GBRMPA (Australian National Audit Office review); 2006 review of GBRMPA Act; Outlook Report; insights report into management of Reef 2050 and Mid-term review of Reef 2050 currently underway
A shared vision for IM	<ul style="list-style-type: none"> - Emerald Agreement 1979 - GBR Intergovernmental agreement (IGA) (2009, 2015) - Zoning Plan (1980's/1990's, 2004 (State and GBRMPA) - Reef Water Quality Protection Plan (three levels of government). - encouragement for EBM approach - trusted relationships got everyone in the room to establish shared vision among all stakeholders groups including industry, Traditional Owners, NGOs, etc. and remained engaged -GBRMPA's Reef Blueprint 	<ul style="list-style-type: none"> -Reef 2050 Plan identifying outcomes that were target driven underpinned by monitoring and reporting - 7 themes spanning biophysical, socio-economic, etc. - Complementary zoning plans, policy, permits, regulations between State and Commonwealth - Complementary water quality plans (brought catchment and marine together) 	<ul style="list-style-type: none"> - Recognition by everybody of failure of existing management to deliver on the individual objectives - eNGOs picked up on above point and pushed the agenda - key industry groups (e.g. ports and tourism) and scientists pushed the agenda - externalities that couldn't consider in past ('we did the best we could at the time' narrative) - retrospective statement of OUV - Values identified via strategic assessment and Program Report. - shared commitment across multiple levels of government 	<ul style="list-style-type: none"> - Cross jurisdictional /agency recognition and commitment for an integrated approach - Stakeholder engagement across jurisdictions - Ecosystem based management approach (built into the Act) - loyalty and commitment to purpose (i.e. personal attribute) - corporate knowledge and systems in place to capture/ use it - systems to fit pieces together (e.g. evidence base) - geography of 'offices' (i.e. GBRMPA is based in the catchment where it's management applies thereby 	<ul style="list-style-type: none"> Has had success: Evidenced by: <ul style="list-style-type: none"> - ongoing engagement by Traditional Owners and stakeholders - 12 Local Marine Advisory Committees from Cooktown to Bundaberg Evaluated through: <ul style="list-style-type: none"> - past Outlook Reports (2009, 2014) and the 2019 Outlook report to inform effectiveness - Annual Reef 2050 annual implementation report

			<ul style="list-style-type: none"> -International spotlight on reef (putting pressure on both governments) - Public outcry 	<ul style="list-style-type: none"> increasing understanding of community views) - Comprehensiveness across all biological, ecological, social, cultural and economic (7 themes) 	
<p>Appropriate legal and institutional frameworks for coordinated IM decision-making</p>	<ul style="list-style-type: none"> - GBRMPA Act – independent statutory authority - articulate ALL relevant acts across scales/government/ time and their relationships - complementary State and Commonwealth legislation - Processes for running IM - Cross delegation of permitting and compliance (i.e. Rangers can pull out both pieces of info/legislation) - Section 66:2e of Act (Aquaculture regulations) - GBRMPA set up an ‘office’ in Canberra (permanent residence) - Reef 2050 governance framework 	<ul style="list-style-type: none"> - Intergovernmental Agreement for a joint Commonwealth / Queensland Ministerial Forum oversight (i.e. high level of oversight and scrutiny). - Legislative amendments around Reef 2050 plans (capital dredge disposal) - Committed to new legislation around Ports - Committed to Cumulative Impacts Policy - GBRMPA set up an officer in Brisbane (permanent residence) 	<ul style="list-style-type: none"> - Establishment of dedicated teams - Willingness to develop and bring in new legislation and policy - Active engagement and willingness of Ports/ Fishing - (barrier) too many governance domains and pieces of legislation of different ages and with a hierarchy of power around GBR decision-making 	<ul style="list-style-type: none"> - Sound governance and legislative/policy framework (e.g. GBRMPA Act/ State Marine Park Act). For example: Dredging Coral Reef Habitats Ban policy Guidelines around Reef Restoration (e.g. coral gardens etc.) - can regulate outside of jurisdictional area 	<p>Some evidence of success’</p> <p>Evidenced by:</p> <ul style="list-style-type: none"> - New legislative amendments to give effect to commitments (e.g. ports and dredge) - funding in reef space at an all time high. <p>Evaluated in:</p> <ul style="list-style-type: none"> - Reef 2050 annual reports and Implementation strategy -2006 review of GBRMPA Act -2019 and past Outlook Reports
<p>Sufficient and effective process for appropriate stakeholder consultation, engagement and participation</p>	<ul style="list-style-type: none"> - Act had good clear objectives - Regional offices that were established after rezoning (2004/5) - Local Marine Advisory committees - Reef Guardian stewardship program (schools from Kinder through to year 12; most local government councils; a limited number of farmers, graziers and fishers) - Catchment partnerships with NRM groups/ report cards - Qld government staff located throughout catchment - Reef water quality governance structures - established networks across 	<ul style="list-style-type: none"> - Formal governance that is resourced and outcomes are communicated (i.e. transparent) - Reef Advisory Committee (RAC) (Reef 2050 plan) - Independent Expert Panel (reef 2050 Plan) - LMAC rep sitting on the RAC - formal communication and engagement plans - decision to bring people into agency with relevant communication expertise and disciplinary expertise - experts in Traditional Owner engagement - RIMRep Steering group 	<ul style="list-style-type: none"> - technological advances (e.g. social media benefits to extended reach across geography) - attitudes of stakeholders and willingness to listen to each other - established relationships, trust - good leadership and calibre of Marine Park Authority chairs and board members 	<ul style="list-style-type: none"> -Stakeholder control ensures outcomes are stakeholder driven and that stakeholder consultation is not tokenistic. - widespread community support - formal governance arrangements supporting consultation and engagement - Strong educational focus (creating stewardship from a young age via Reef Guardian stewardship program) 	<p>Success. Building on foundation of strong consultative and participatory engagement process.</p> <p>Evidenced by:</p> <ul style="list-style-type: none"> - Ongoing Stakeholder and Traditional Owner engagement - engagement not tokenistic - more people want to join the table (e.g. cane growers) <p>Reviewed in:</p> <ul style="list-style-type: none"> - Multiple reviews of GBRMPA (Australian National Audit Office review) - 2006 review of GBRMPA Act - Outlook Report - insights report into management of Reef 2050 - Mid-term review of Reef

	<p>commonwealth and state government, with Traditional Owners, eNGOs, etc.</p> <ul style="list-style-type: none"> - GBRMPA has established reputation (credibility and legitimacy) built through a proven track record of field management, education activities, RAP process, etc. - Stipulated in the Act 				2050 currently underway
<p>A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.</p>	<ul style="list-style-type: none"> - Precondition for RIMRep: (1) 2014 NERP project (Paul Hedge et al.) and (2) Ken Anthony and Dambacher NERP assessment (RSP) - Objectives of Reef 2050 plan, workshop with Traditional Owners to identify their objectives which were incorporated. - SELTMP - AIMS Long term monitoring - Strategic Program report 	<ul style="list-style-type: none"> - Driver / Impact / State/Pressure/Response model and subsequent 7 themes with outcomes and objectives - Conscious decision not to separate theme for indigenous owners (fully integrated across themes) - Commitment in Reef 2050 plan to establish Monitoring and Modelling program - Ecological, Social and Economic indicators are being developed - Good Governance 	<ul style="list-style-type: none"> - NESP /NERP/MTSRF/NERF - AIMS - relationships with Traditional Owners/indigenous reef advisory committee - SELTMP - Strategic assessment program report - RIMRep - Co-location/geography with research community 	<ul style="list-style-type: none"> - Clear objectives and outcomes across a suite of values (e.g. Nested objectives both in Act and zoning plan - e.g. Environment, Biodiversity and Heritage Values and sustainable uses within that context) 	<ul style="list-style-type: none"> - Framework is successful, but ability to demonstrate outcomes yet to be evaluated although Australia's next World Heritage State Party Report will use the 2019 Outlook report as an input
<p>Explicit consideration of trade-offs and cumulative impacts of multiple activities</p>	<ul style="list-style-type: none"> - LNG developments and cumulative impacts concerns/offsets - Support for private and industry sectors in advisory committees associated with Reef 2050 Plan - MoU with Qld Ports Association and associated roundtable discussions - Strategic Assessment report - 2009 Outlook Report 	<ul style="list-style-type: none"> - Draft cumulative impacts Reef 2050 policy - 'Forward looking' at drivers in planning process on full suite of values - Draft offsets guideline for Reef 2050 - Net benefits impacts policy - Reef 2050 guideline for decision-makers 	<ul style="list-style-type: none"> - Access to data/information about cumulative impacts - NESP funding to do case studies around this - GBR MinCo (then became MinFo - ~2010) meeting more regularly again because of it being a 'hot topic' - (barrier) complexity of implementing across multiples jurisdictions - (barrier) Competing political priorities/agendas (e.g. northern Australia) - (barrier) capacity of existing legislation to account for cumulative effects - (barrier) cherry-picking legislation for agenda - Not just case by case decision-making (e.g. plans of 	<ul style="list-style-type: none"> - consideration of past, present and future - think outside the box (i.e. recognition of coastal/terrestrial link) - forward looking (proactive) management agency - Since 2014 there has been explicit focus on being forward looking by GBRMPA (i.e. <i>predictive capacity</i>), reinforced by back to back mass bleaching - Multiple decision-support tools (e-reefs, modeling work, etc.) - GBRMPA's Reef Blueprint (2017) - Issues are across different agencies and effective multi-systems management exist 	<ul style="list-style-type: none"> - Partial success – frequency and severity of climate change effects are swamping the gains achieved by local and regional management efforts (but note that locally headway is being made on issues like water quality and direct use, this is why success is partial). - Evidenced by: <ul style="list-style-type: none"> - Well into the development of fit for purpose integrated monitoring and modeling and reporting program - Evaluated in: Outlook Reports (2009, 2014_ and (forthcoming) 2019

			management)	- recognition of synergistic impacts	
Process flexibility to adapt to changing conditions.	<ul style="list-style-type: none"> - legislative framework for this to happen - Reef 2050 Plan built on principles of adaptive management - Stakeholders accept the process with change/adapt - access to best available science/data - supportive leadership 	<ul style="list-style-type: none"> - hierarchy of review process - designed to be adaptive with mid-term and five year review - built in contingences to respond to changing circumstances - foundational management with built in adaptive management allowances underpins Reef 2050 	<ul style="list-style-type: none"> - (barrier) risk of 'opening up' everything if you only want to change one thing (e.g. zoning plan) (pro and a con, two edged sword, good and bad) - review process built into design - (barrier) two competing forces: one that wants certainly and one that wants flexibility (e.g. hard to juggle around cyclones). 	<ul style="list-style-type: none"> - need balance between certainty (e.g. permitting of operators) and flexibility - ability to make decisions in the absence of perfect knowledge and navigate these challenges . 	<p>Successful.</p> <p>Evidenced by:</p> <ul style="list-style-type: none"> - one of very few places in the world where there has been a "Hollings and Walter's" active adaptive management test (The effects of line fishing project) <p>Evaluated in:</p> <ul style="list-style-type: none"> - Outlook report - Independent evaluation of management effectiveness. <p>Point to note: Climate change overtaking GBRMPAs ability to manage issues of a global nature</p>
Process for ongoing review, evaluation and refinement	<ul style="list-style-type: none"> - joint federal/state plan with international accountability by World Heritage Committee - good access to baseline data and expertise - internationally recognised approach through management effectiveness evaluation via IUCN 	<ul style="list-style-type: none"> - Outlook report every 5 years - mid-term review of Reef 2050 Plan - Annual Implementation reports - Building a system to enable commitments within Reef 2050 Plan to be evaluated (via RIMRep) - 5 year reviews of Reef 2050, after each Outlook Report - Transparency and accountability 	<ul style="list-style-type: none"> - strong ownership by everyone around the table - joint federal/state plan with international accountability (the spectre of world heritage) - transparency of reporting (e.g. around trends) 	<ul style="list-style-type: none"> - Statutory requirement every five years to review (e.g. Act is very specific as to requirements for reporting and the people who do the reporting) - Effective and prioritised research and monitoring program - International obligations for reporting 	<p>Partial success:</p> <p>Commitment to establish a fit for purpose integrated monitoring, modeling and reporting program is well underway.</p> <p>Evaluated by:</p> <ul style="list-style-type: none"> - Operationalised RIMRep - Outlook report tracking condition and trend in GBR values.
Effective resourcing, capacity and tools	<ul style="list-style-type: none"> - Longstanding joint agreement among State and Federal regarding field management (matching funds) - access to incredible science and scientists, experiential knowledge among managers, and long legacy of reef research - depth of individuals within organisations - tool-box of support tools 	<ul style="list-style-type: none"> - Ongoing joint funding arrangements between commonwealth and state governments - Reef 2050 Executive Steering Group (fortnightly Commonwealth/State discussion) - Reef Integrated Monitoring and Reporting (RIMRep) \$8million. - Investment strategy and framework 	<ul style="list-style-type: none"> - Expertise of scientists and managers (champions) - cluster/hub of GBRMPA/JCU/CSIRO/AIMS/etc. - Very high profile issue (globally iconic) - Changing fast so impetus to meet - high levels of trust among partners - Research partnerships (e.g. JCU, AIMS, etc.) via MoUs, contracts, etc. 	<ul style="list-style-type: none"> - Investment framework identifying all resources across government and key sectors (e.g. local governments, ports, research, etc.) for Reef issues - Matched funding approach between State and federal Governments - Cross delegation of permitting and compliance (i.e. Rangers can pull out both pieces of info/legislation) 	<p>Partial success.</p> <p>Lots of funding, but some values still in decline and more funding needed. Trajectory of funding is going the right way.</p> <p>However, global action on climate change is also required.</p> <p>Also, time window for</p>

	<p>well established and complementary with Qld government</p>		<ul style="list-style-type: none"> - 6 clearly identified priorities in investment framework - Water quality scientific consensus statement - strong science - community led initiatives - (barrier) jurisdictional complexity 	<ul style="list-style-type: none"> - (disenable) matched funding can lead to one governments stalling the other - Environmental Management Charge Process - Scientists seeing their data being used for management - Midyear Economic Forecast Outlook (enhanced funding for COTS control and compliance) - Effective and prioritised research and monitoring program 	<p>addressing problem is getting smaller.</p> <p>Also, need greater international focus and resourcing which is outside scope of GBRMPA.</p> <p>Reviewed in:</p> <ul style="list-style-type: none"> - Outlook report 2009, 2014 and forthcoming 2019
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Appendix 3c – Southeast Queensland Healthy Waterways Partnership

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
Recognition of the need for IM	<ul style="list-style-type: none"> -Southeast Queensland (SEQ) has a fast growing population. -Studies of Moreton Bay since 1998 identified water quality as a main issue. -Strong recognition from all levels of government about the need for cooperative action because water quality at the bay depends on improvements in land & water management from upstream councils. -Recognised need to integrate science to support integrated management. 	<p>Strategic plan described vision 2020: <i>"By 2020, our waterways and catchments will be healthy ecosystems supporting the livelihoods and lifestyles of people in South-east Queensland, and will be managed through collaboration between community, government and industry."</i></p>	<p>Recognition that local councils alone could not improve regional water quality from catchments to Moreton Bay. Brisbane City Council Lord Mayor (Jim Soorley, served from 1991 to 2003) was long standing, respected and promoted collaborative connections. SEQ councils cooperatively funded the work to improve regional waterways health and the healthy waterways partnership.</p>	<p>Standardised method to calculate water quality grades from sub-catchments to catchments published as an annual report card for each catchment in SEQ.</p>	<p>High public awareness of water quality grades, trends and pressures on water quality. Increased community awareness of how they can help contribute to improved water quality. Scientific rigour and independent review of data and calculation of annual water quality report card grades</p>
A shared vision for IM	<ul style="list-style-type: none"> - There was widespread public awareness of deteriorating water quality and appreciation of the need for an integrated approach to improve waterways health. -Degrading water quality from catchments to Moreton Bay – increased nutrients and sediments from urban growth (land clearing to accommodate housing, roads and other infrastructure, more sewage, etc.) but also from rural land use 	<p>-A vision for SEQ waterways and Moreton Bay was established early in the process with stakeholders: <i>"By 2026, our waterways and catchments will be healthy ecosystems supporting the livelihoods and lifestyles of people in South East Queensland, and will be managed through collaboration between community, government and industry"</i>.</p>	<ul style="list-style-type: none"> -Initial leader of initiative was good at linking councils with industry and scientific advisors -People were proud of partnership -Expert panels provided scientific oversight and integrated rigour -Importance of receiving water quality given the Internationally significant wetlands in Moreton Bay under RAMSAR agreement 	<ul style="list-style-type: none"> -In order to achieve vision the <i>Healthy Waterways</i> developed a long-term strategy, which is an integrated set of activities coordinated in the region with a timeframe of 5 years. -The Strategy contains over 500 agreed committed actions to maintain and improve the health of waterways -Introduced idea of report cards and evaluation. 	<ul style="list-style-type: none"> -Public knew what was going on, and appreciated need. -Over time communities expected the annual report card scores as the 'norm'
Appropriate legal and institutional frameworks for coordinated IM decision-making	<ul style="list-style-type: none"> -Environmental protection Act 1994 -Partnership was largely voluntary but with pressure from all councils that it should be all councils and not just a handful. Myers et al. provide a summary of the evolution of the legal framework to 	<ul style="list-style-type: none"> -Sat under Qld government legislation. Worked across jurisdictions. - Partnership linked diverse objectives of different councils. - SEQ coastal management strategy follows the framework provided by the <i>State Coastal Management</i> 	<ul style="list-style-type: none"> -Councils were of different sizes and had different capacities, at different stages. -Key champion advocated for partnership rather than awaiting legal provisions -In 2006 the Healthy Waterways Partnership had support from 19 local governments, 6 state agencies 	<ul style="list-style-type: none"> -2009 Sustainable Planning Act (2009) prescribed matters of environmental significance for wetlands and watercourses, waterways, fish habitat and marine plants - Development of State Coastal Management Plan -Merged with SEQ Catchment 	<ul style="list-style-type: none"> -Healthy Waterways brand still recognised and despite legislative changes the annual report card program has persisted. -Management arrangements (summarized by Maher and Nichols), reflected the complexity of diverse administrative interest

	support IM in SEQ, including: "Queensland's Coastal Protection and Management Act established in 1995, Queensland's State of the Environment Report 1999, and Queensland's State Coastal Management Plan came in 2002	Plan and is covered by the SEQ Coastal Plan which gives specific regional direction on the sustainable management of development and growth along the SEQ coast to minimise the adverse impacts on coastal resources (Mosadeghi et al. 2009).	and 30 major industry and environmental groups in the SEQ region	initiative	(especially municipal and state organisations) and a reference group of relevant stakeholders. - 'Good structures and processes for collaboration and integration; a structure which brings all interested and affected people together, enables presentation of independent advice, the targeting of the issues by agreement, and adoption of an agreement based strategy'
Sufficient and effective process for appropriate stakeholder consultation, engagement and participation	- Previous community activism re poor water quality in Moreton Bay.	- Partnership had committees that engaged people. Early example of participatory approach.	- Dedicated communications staff and strategy that kept stakeholders engaged long term. - 'Values were regarded as vital to HW's 'culture' or climate and key values were identified as: Commitment by all players; Transparency of decisions and operations; Credibility of the science and of the projects; Accountability; Optimism or a sense of a positive future; Quality of work and of relationships; Clean water; and Peoples' expertise and their personalities across all sectors.	- Consultation and communication. Awards drove healthy competition among councils. - 'Stakeholder involvement in agreement-based decision making; government, industry and community work unified under the one umbrella of Healthy Waterways with consideration of social, cultural, economic impacts of environmental choices and a 'whole of community' approach to monitoring and feedback' and 'Healthy Waterway's pro-active stance on community involvement and cooperation' were identified as critical success factors for HW [5]	Annual community meetings aligned to Annual General Meetings of NRM groups. Feedback sought from public and stakeholders following release of each annual report card.
A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.	- Links between water quality and economic values of flood protection, riparian property values, recreation, fisheries, water supply and wastewater treatment. - Values of social capacity development including trust, education, awareness, local problem-solving understood and developed as part of the	- Report card integrated several aspect, and had clear objectives on ecosystem health attributes. - Comprehensive spatially. - Included monitoring schedule.	- Annual report cards with clear criteria and reporting structures	- Have had to reduce sampling due to cutbacks. Increased load monitoring modelling, seagrass monitoring,	- Objectives and results of annual report cards are communicated to the general public through websites and social media. Issues around improving report card grades in some council areas due to natural/historical catchment conditions.

<p>Explicit consideration of trade-offs and cumulative impacts of multiple activities</p>	<p>Healthy Waterways. -Reporting on Cumulative impacts on waterways was initial aim of the report card</p>	<p>- Cumulative impacts on water quality of development, land use etc. -Not much on trade-offs</p>	<p>-Healthy Waterways commissioned work to scope trade-off analyses (including economic and social in 2011).However, the work was not continued due to funding limitations.</p>	<p>- Over time some social (Waterways benefit rating included community values, access, economic benefit, contribution of relevant catchments to drinking water).</p>	<p>-The <i>SEQ Coastal Plan</i> was developed through consultation with groups and organisations that have responsibilities within the region and include State and local governments, industry, conservation, Indigenous Traditional Owners, community groups and commercial and recreational fishing associations (SEQ Regional Plan 2006).</p>
<p>Process flexibility to adapt to changing conditions.</p>	<p>-Partnership has changed over the years due to merger and cuts in science funding</p>	<p>-Use of modelled report card grades instead of field observations due to budgetary constraints.</p>	<p>- Enabler: public trust in report card system (other report cards have built themselves on the reputation of the SEQ Healthy Waterways report card</p>	<p>NA</p>	<p>Maier and Nichols characterized HW as a 'change management' process that included vision, clarity and unity of process, champions, appropriate structures and processes, and resourcing</p>
<p>Process for ongoing review, evaluation and refinement</p>	<p>-There was originally a review and evaluation process, but this has since changed due to changing partners and disbanding of expert science panels</p>	<p>'The Partnership has produced information-based outcomes which have led to significant cost savings in the protection of water quality and ecosystem resources by its stakeholders'</p>	<p>Good quality science was articulated as a successful factors. Abal et al. describe the 'key elements of the Partnership' as follows: the 'implementation by a range of partners of management actions ranging from upgrades in sewage treatment plants, to improved planning regimes and rehabilitation of riparian vegetation; a multi-disciplinary science and research program that underpins the management action program and monitors its effectiveness; and the Healthy Waterways promotional and educational program that seeks to build on similar activities of partners and ensure that there is community awareness and support for</p>	<p>-People stepped up to contribute. Academics contributed student thesis effort. Tender processes for specific studies facilitated by the Partnership.</p>	<p>-Feedback sought from public and stakeholders following release of each annual report card.</p>

<p>Effective resourcing, capacity and tools</p>	<p>-Partnership was supported by Councils (and Queensland government)</p>	<p>-Councils all signed on with agreed sliding scales for contributions</p>	<p>action'. -Maher and Nichols documented the perceived importance of 'quality staff and can-do attitude' to critical success.</p>	<p>'Adequate financial resources generated through creative alliances of governments, industry and community, sourced externally and matched by an increased level of self-funding over time' was identified as critical success factor'.</p>	<p>-Sufficient resources lasted quite a while (until Newman government cut backs). --Local councils still contribute most of the funding despite significant reductions in State Government funding.</p>
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Much of this information derived from: 1) Abal, E.G., S.E. Bunn, and W.C. Dennison, eds. *Healthy waterways healthy catchments: making the connection in South East Queensland, Australia*. 2005, Moreton Bay Waterways and Catchment Partnership: Brisbane. 222.; 2) Maher, M. and P. Nichols, *Transferring success – an examination of Healthy Waterways management initiative in South-East Queensland: A study to identify, and to examine the transferability of, the critical success factors of the “Healthy Waterways” project model - South-East Queensland, Australia*. 2002, 3) Mary Maher & Associates: Brisbane; South East Queensland Healthy Waterways Partnership, *South East Queensland Healthy Waterways Strategy 2007-2012 - Strategy Overview*. 2007, Brisbane. 127.; 4) Myers, S., et al., *Adaptive Learning and Coastal Management in South East Queensland, Australia*, in *Sustainable coastal management and climate adaptation*, R. Kenchington, L. Stocker, and D. Wood, Editors. 2012, CSIRO Publishing: Collingwood. p. 157-176.

Appendix 3d – Gladstone Healthy Harbour Project.

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
Recognition of the need for IM	<p>-Largest multi-commodity port in Queensland and the fifth largest in Australia – bordering the GBRMP and within the GBRWHA</p> <p>- Long term: tension around cycles of development & footprint</p> <p>Previous community activism with regard to industry impacts (human health concerns) on air quality</p> <p>-Immediate: Fish kill and public outcry</p> <p>-Several natural and anthropogenic activities that impacted on the health of the harbour from 2010 to 2013 leading to concerns over the impacts of major industrial expansion, fish health incidents, safety of recreational harbour users and habitat loss.</p>	<p>-Once events pushed the button there was concerted effort to get action (catalysed by recognition of cumulative impacts)</p> <p>-Quadruple bottom line (environment, social, cultural and economic) approach and ten core design considerations identified and agreed early in the development of the Report Card (during the 12+ month period whilst the GHHP MOU was being negotiated) - 1) strong links to all stakeholders at all stages. 2) rigorous science. 3) effective communication. 4) setting clear goals. 5) realistic expectations. 6) flexibility in implementation. 7) transparency, open access and accountability. 8) results linked to actionable management recommendations. 9) regular evaluation. 10) long term commitment.</p>	<p>-driven by social licence to operate and senate inquiry results: important commercial fishery was hampered by condition and market perception; air and water quality issues also helped drive action (link to reef water quality plan)</p> <p>-Qld elections and change of Government (Blihs Labor to Newman LNP) and Newman’s experience with the SEQ Report Card</p> <p>-Recommendations of the Gladstone Fish Health Scientific Advisory Panel Report (delivered just before the change in Government)</p> <p>-Qld - Strong political desire to get Gladstone off the front page of the news papers</p> <p>-WHC review of GBR at risk also an enabler including an UNESCO visit to Gladstone.</p> <p>-Commonwealth – Strong political desire to appease the UNESCO/WHC assessment of GBR.</p> <p>-Distrust amongst stakeholders. Stakeholders viewed the GHHP as a mechanism to get a “trusted” and agreed set of data/information on the table i.e. interpretations may be different but no one questioned the data/knowledge set.</p>	<p>-Partnership to deliver on rest of the process (and got recognition)</p> <p>-Newman announced the GHHP in May 2012 but had not consulted with any of the partners – leading to 12 months of consultation before the launch of GHHP in November 2013. But during this period, and with the support of the potential partners the Qld Government, supported the formation of the Independent Science Panel (ISP) and design of the Report Card.</p>	<p>- GHHP formed with representatives from all groups except the environmental NGOs. They were unwilling to participate in the partnership, as they feared it would constrain their lobbying options.</p> <p>Management Committee – equal representation of community (3 with one indigenous), industry (3) and Government (3 – local, state and commonwealth) with equal voting rights but different levels of resource contribution - i.e. a greater dollars contribution did not buy more control.</p>
A shared vision for IM	<p>- Government commitment to the report card process, but there was no actual pressure</p>	<p>-Clearly articulated shared vision in the GHHP stage 1 framework. This is a true</p>	<p>- Involvement of key industry stakeholders in the current partnership, which is open to</p>	<p>-Only report card and then up to each industry to implement operational change and push</p>	<p>-GHHP functional and report cards now annual (with sci basis and refinement) with</p>

	<p>on industry to engage in the GHHP from Government and some industries decided not to participate.</p> <p>-There were some industry concerns with regard to social licence to operate that <u>may</u> have contributed to their decision to participate</p> <p>-There is a shared vision and most importantly its development was led by stakeholders, and refined by scientists.</p>	<p>partnership with partners signing up to the MOU and contributing cash and not regulator overarching push.</p>	<p>community input too; Same focus and pressures for GBR more broadly</p> <p>-As noted above there were strong political pressures at a sensitive time for both the Qld and Commonwealth governments (change of government in Qld; appease the UNESCO/WHC assessment of GBR). It was not industry driven. It was community driven and in particular by the Gladstone Region Environmental Advisory Network (GREAN) - a Gladstone Regional Council body. There was also pressures from Environmental NGO (a lot of what was driven by the coal agenda) but they did not join the GHHP. With the Government and Community commitment Industry followed.</p>	<p>for regulatory change; No legislative power to do anything. But it is worth noting that all the regulators and many of the regulated are on the GHHP. So the view was if there was an issue identified resulting in a recommendation for an operational/regulatory change it is likely it will happen and probably faster than a government process.</p>	<p>media coverage; broader benefits to community around condition of local area and active involvement; annual scenario planning exercises.</p>
<p>Appropriate legal and institutional frameworks for coordinated IM decision-making</p>	<p>-Partnership and processes in place (around MOU, economic framework, clear governance arrangement about how the GHHP operates etc)</p>	<p>-The partnership process was well laid out (see website¹ for detailed information), expansion still possible with clear responsibilities</p>	<p>-Ongoing vigilance and pressure as port and other industries are expected to continue to expand The GHHP is not just about the port operations, it is about all the industries associated with Gladstone Harbour.</p>	<p>-Dynamic living and evolving partnership (pros and cons)</p>	<p>-GHHP functional and still working together; community not loud (even if not 100% content either).</p> <p>-Gladstone Harbour does not feature on the front page of newspapers.</p> <p>-Gladstone Harbour is not a key issue for UNESCO/WHC.</p> <p>-Also worth noting the report card results suggests a lot of the original claims about the Harbour were “overstated” as reflected in the report card scores.</p>
<p>Sufficient and effective process for appropriate stakeholder consultation,</p>	<p>-Social licence to operate driven so dedicated communication and involvement</p> <p>Regular community events including general community</p>	<p>-Have dedicated communications group contracted plus community consultation/interaction via GHHP staff attending GREAN meetings.</p> <p>Community members on the</p>	<p>-Had trust issues initially but ok now; potential for future fracturing if taken for granted but active members head that off.</p> <p>The key risk to GHHP is</p>	<p>-Media expectations, consultation expected, schools program, transparent website so all information and data are available.</p> <p>Transparency and open access to data and</p>	<p>-Website accessed, movies/books produced for schools, report card gets high local coverage; becoming a model for other report card locations (and coordinating with them)</p>

<p>engagement and participation</p>	<p>as stakeholders.</p> <p>There are two key elements to the GHHP the ISP/science program and communications and they are separate. For example the ongoing budget for communications is about 20% of the GHHP budget. In the establishment of the GHHP the decision was to keep the communications separate to the science (different to many other report cards).</p>	<p>management committee with equal power to the Government and Industry Reps.</p>	<p>resources. It costs \$1m /yr to operate and the key funders are government (Commonwealth and State).</p>	<p>information was a key principle in establishing the GHHP and interestingly there was some resistance to this by some research providers.</p>	
<p>A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.</p>	<p>- Given cumulative impacts was the driver there are some core defined objectives which are now being used to guide monitoring and reporting process.</p>	<p>-Quadruple bottom line (cultural, social, economic, environmental) clear in report card and nested indicators underneath</p>	<p>-Researcher partners in GHHP; plus ISP to have oversight (and the initial chair of that was a champion who set it up well) and willingness (with confidentiality conditions) to share data and methods for repeatability and transparency</p>	<p>-Report cards with clear criteria and framework and reporting structures</p>	<p>- Report cards well documented with data delivery website that lays everything bare</p>
<p>Explicit consideration of trade-offs and cumulative impacts of multiple activities</p>	<p>-Driven by cumulative impacts but no formal management outcome forced once trade-off recognised</p> <p>To date there has not been an issue(s) identified by the report card that requires a ‘trade off’ but the report card has influenced a key policy decision – capital dredging in the GBRMPA and operation approaches by some partners: e.g. LNG industry approach to community consultation, Industry operations and future planning e.g. Gladstone’s Ports focus on improved efficiencies.</p>	<p>-Intentional around reporting, but yet to adopt explicit consideration of trade-offs beyond acknowledging them from the work and going back to own industries to get action or to flag in normal mgmt. processes</p>	<p>-Report card process with ISP oversight and public attention who want to trust report card process (as sceptical of poor ones in the past); official organisation with “mandate” to focus on this</p>	<p>-Regular discussion between the members of what is found; annual reporting with some motivation for more in-depth analysis (but limited funds)</p>	<p>-Learning and responding to feedback on report card content and to increase credibility. Do they want to go more and expand thinking/planning or want to stay with report card – are trying to look at scenarios through their agreed framework (model) etc.</p>
<p>Process flexibility to adapt to changing</p>	<p>-Want openness so willing to listen to critique and respond (as contentious location that could blow up again); nested</p>	<p>-Open partnership (so new people/groups/ Institutions etc can join) ISP tends to poke them to</p>	<p>- ISP, high social profile and dynamic location with new issues arising all the time (e.g. local community issues now</p>	<p>-Willingness to adjust report card etc as needed, but desire for consistency and continuity (trends) and high quality end</p>	<p>Has evolved with the changing conditions and it is continuing despite state/national pressure off;</p>

conditions.	within GBRWHA but not (GBRMP) with its attention; ISP as continued driver for innovation and holding to standards originally laid out	remain dynamic (at least at present)	focus and moving away from environment... danger of moving to less tangible issues?)	product	local pressure still high so local impetus
Process for ongoing review, evaluation and refinement	Need to stay relevant	At least at early stages and through the intentional adaptive form. The extent of future review and adaptation (e.g. should cumulative impact trade-offs emerge) remains to be seen (as not in that position yet).	Had good personnel help draw it up in the first place. Given its nature for political/economic and outcome reasons review is likely (evolution will be interesting) The key risk to GHHP is resources. As noted above it costs \$1m /yr to operate and the key funders are government (Commonwealth and State). There seems to be a desire by both to reduce funding as they possibly see it as an annual box ticking/announcable for their minister. The counter to this is the continued focus on the status of the GBR by the WHC.	Voluntary partnership with ear to the ground on regulatory requirements, but also community desires (given social licence to operate issues); now mutual support group when new issues come up	Bit early to say so far Longevity with current suite of partners will be a measure of success Industries currently seem to be maintaining social licence
Effective resourcing, capacity and tools	Govt injection and high value partners	Partnership contributions mandatory and funding requirements clear (fees to be on board plus research contributions etc); oversight/administrative connection with existing Fitzroy Basin Authority – as it hosts both report cards.	Is voluntary so could fall apart or contract through time; dependent on what partners willing to contribute (ask a lot of ISP and there is a 50% inkind support).	Get good local contribution and some high profile research that is contextually aware; some dedicated staff to move it along and project manage.	Has been able to service needs; relative stability in players at the table; model for other partnerships and how to tackle IM without legislative basis (longevity will be the ultimate mark of success, that and how to avoid over engineering while maintaining interest)

1. <http://www.healthyharbour.org.au/>

Appendix 3e – New South Wales Marine Estate Initiative.

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
Recognition of the need for IM	<p>-Review of Science of Marine Parks (2009) followed by Independent Scientific Audit of Marine Parks in NSW (the Audit report) (Beeton et al. 2012) gave recognition of poor understanding of social considerations during marine park planning and zoning reviews.</p> <p>-Existing approach was too limited, stakeholder (e.g. recreational and commercial fishers) issues was an important precondition to change, MPA alone was not addressing the key threats</p> <p>-Normal sector base approach stopped IM for a while</p> <p>Narrow legislative view for each sectors (water pollution), fishing, land management</p>	<p>The Audit report provided recommendations for changes to governance and institutional arrangements. This identified that the governance of the NSW marine estate be reorganised by bringing the entire estate under one legislative and administrative structure.</p> <p>It recommended that there be a clear focus on ecological, economic and social research, and management approaches that including threat and risk assessment. Further recommendations include legislative review and rationalisation, improved public participation and community engagement and education, land-use planning, Aboriginal culture, knowledge and liaison, and compliance</p>	<p>Following government acceptance of key recommendations from the Audit report, Marine Estate Management Authority was established. This is a cross-agency coordinating, review and approval group. It consists of agency heads, an independent chair, and the chair of the MEEKP.</p> <p>Approved five step process that would allow agreed objectives and clear integration.</p>	<p>Establishment of a Marine Estate Management Authority (MEMA) to set the strategic framework and priorities for management of the entire marine estate by service delivery agencies.</p> <p>Establishment of an independent Marine Estate Expert Knowledge Panel to provide expert advice to the Authority on key knowledge needs and support evidence based decision making.</p> <p>The governance arrangements have many features in common with our conceptual diagram</p> <p>Developed the Act for legislative reform (step 1), to replace Marine Parks Act. Common objectives around Marine Estate Management Strategy (binds all the blue boxes together – 9 initiatives).</p>	<p>There was general success with respect to this first step as the identified need was recognised in the Audit report that included significant stakeholder input, and then accepted by government.</p> <p>There was broad stakeholder agreement with the marine estate reforms.</p> <p>An integrated view recognised the need to address a range of threats, not just those managed in marine parks.</p>
A shared vision for IM	<p>-The Audit report provided impetus, but vision statement developed early on in the MEMA process. This included to definition of a set of guiding principles that was driven by the MEEKP.</p> <p>-No prior integrated vision across marine agencies. No recognition of marine estate as a management unit. - Fragmentation and lack of view around what was being sought, which had to be overcome.</p>	<p>-A specific vision statement was developed, stated as <i>'Healthy costs and seas managed for the greatest wellbeing of the community now and into the future'</i>.</p> <p>-The State government response to the Audit report identified a need for improved cross agency integration and shared vision.</p> <p>-This included the establishment of the Marine Estate Management Authority (MEMA), with independent chair and science advisory</p>	<p>-Establishment of MEMA and MEEKP and Act and developing of the ten guiding principles for management of the NSW marine estate</p> <p>Principles spoke to each group concerns, and set standard and framework (e.g. for consultation)</p> <p>-MEMA also documented clear five step decision making process:</p> <ol style="list-style-type: none"> 1. Identify community benefits and threats 2. Assess threats and risks to 	<p>-Features articulated in the ten guiding principles (The Principles paper).</p>	<p>-There was a successful development and communication of the marine estate vision and guiding principles. Broad acceptance and recognition of the vision.</p> <p>-Vision and principles speak to all marine user groups in NSW and identifies community wellbeing as a key component.</p>

		panel, the Marine Estate Expert Knowledge Panel (MEEKP). Interdisciplinary science panel was expert-based to provide independent advice to government.	benefits 3. Assess current management 4. Develop and implement management responses to priority threats 5. Monitor evaluate, report		
Appropriate legal and institutional frameworks for coordinated IM decision-making	Some legislative structures existed. Some cross agency management of marine protected area system through Marine Parks Authority. Numerous parallel reforms underway at similar same time (e.g. Acts). Formation of new Government and Audit report provided conditions for a range of relevant reforms.	A range of new legislation, regulation and policy frameworks developed to provide improved integration, including: Marine Estate Management Act (2016), Threat and Risk Framework and the Marine Estate Management Strategy	Abolition of Marine Parks Act and establishment of the Marine Estate Management Act and associated regulations. A number of related legislative and governance reforms and policy initiatives occurring in parallel, including: -Coastal Management Act (2016) -Aboriginal Cultural Heritage Reforms -Biodiversity Conservation Act (2016) -Commercial Fisheries Business Adjustment Program -Biosecurity Reforms (2015) -NSW Boating Reforms (2016) -Climate Change Policy Framework (2016) -Crown Lands Act (2016) -Regional Ports Strategy -Marine Waters Sustainable Aquaculture Strategy	Marine Estate Management Act, MEEKP Lots of things established to achieve objectives of IM. Lots of recent related reforms, all going for different lengths of time. Continuity of government during the reforms process has helped.	New legislation and policy frameworks completed. Threat and risk assessment framework developed and successfully conducted at state and regional levels, and includes environmental, social, cultural and economic components. Draft Marine Estate Management Strategy completed based on new legislation.
Sufficient and effective process for appropriate stakeholder consultation, engagement and participation	Positive: Marine parks zoning reviews and presence of advisory committees provided some existing structure. Spatial planning existed and accepted by some stakeholders. Negative: Isolated objectives and based on involvement with advisory committees and lack of participation in setting	A clear MEMA communication and engagement Strategy was developed, which included: -Marine Estate website -Regional engagement meetings -Use of independent facilitators -Development of an on-line tool to facilitate improved documentation of risk results and to improve feedback	Meets objective of key MEMA guiding principle. Implemented the tools in the design, including specific communication and engagement strategy.	Cross agency commitment and contribution to the multi-stakeholder engagement. MEMA agency representatives present and helped understand different stakeholder and agency views in round tables. Non-sectorial discussions helped discussion on common goals.	Conducted evaluation of success of engagement. Submission report made available that documents outcomes of engagement. Follow up allows stakeholders to see views recognized – “closing the loop”

	objectives from broader community. Top down process that did not fully consider social, cultural and economic issues.	- Separate aboriginal consultation process -Regular stakeholder newsletters			
A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.	<p>Positive: The relevant objectives were recognised and existed in some legislation and policy architecture. Increasing stakeholder awareness for social and economic objectives. Audit report highlighted the need to have greater focus on social, cultural and economic attributes.</p> <p>Negative: Absence of information for how to include social, cultural and economic objectives (relative to biophysical guidance), and how to identify how best to integrate environmental, social, cultural and economic. Little recognition of Aboriginal cultural heritage. Little economic information e.g. value of recreational diver sector and variable measures.</p>	<p>Marine Estate Community Survey (2014) – this survey was conducted early in the process to assess the benefits that the community derive from the NSW marine estate, and what they saw as the key threats to those benefits. (Brooks and Fairfull and Jordan et al papers describe process and results)</p> <p>A detailed and integrated threat and risk assessment was conducted to quantify the level of threats and risks to the marine estates environmental assets and community benefits.</p>	The MEMA threat and risk assessment includes distinct ecological, social, cultural and economic components. These are then reflected in the Marine Estate Management Strategy which contains initiatives and actions that address all components, and focusses on community benefits.	Explicitly multi-sectoral, and triple bottom line, with an overall objective of considering all activities and relating threats to benefits that the community derive from the marine estate.	The Marine Estate Management Strategy has defined initiatives that integrate environmental, social, cultural and economic objectives. Includes specific actions that identify monitoring and evaluation of relevant management actions and overall strategy. Stakeholders have been engaged in the development of the Strategy.
Explicit consideration of trade-offs and cumulative impacts of multiple activities	<p>-Ecological offset program has been in place that allows some trade-offs. Trade-offs were considered in marine planning, but were not transparent.</p> <p>-Lack of understanding about interactions prevents estimation of cumulative impacts</p> <p>Some 'legacy' problems (i.e. result of cumulative impacts over many years), can't be easily corrected by current management.</p>	Threat and risk assessment provides information that allows consideration of trade-offs, and a specific evaluation framework was developed among groups according to ten principles. (refer to trade-off/evaluation and guideline for decision makers paper).	The MEMA threat and risk assessment identified a number of areas of cumulative risk, including environmental, economic, cultural and social. Trade-offs were considered during the evaluation of management options that led to targeted actions in the Marine Estate Management Strategy.	Explicit trade-off and cumulative impact process (refer to 7c). Cumulative impacts were identified around threat risk assessment (water quality, fishing) a set of values identified). Further cumulative assessment will follow the Dunstan/Dambacher NESP cumulative impacts GBR approach.	Too early to tell
Process flexibility to	Positive: As the overall	-Principles and processes are	-Clear identification of the	-The MEM Strategy has a mid-	- Too early to tell as

<p>adapt to changing conditions.</p>	<p>process and governance arrangements were new, but agreed to be relevant by MEMA agencies, considerable flexibility was required by individual agencies to reach agreement on key steps (e.g. Threat and risk framework).</p>	<p>well documented, so expectation is that it should be adaptable/flexible to rationale change. -Designed to have longevity and resilience. 10-year plan, so will outlive one term of government. -Governance structure with independent chair. -Considerable public support. MEMA is integrated in diverse departments, so cannot be an easy single 'target' for changed governance structure.</p>	<p>MEMA five step process that identifies monitoring, evaluation and review step.</p>	<p>program review after 5 years to evaluate the success of management initiatives. New and emerging risks will be considered and addressed in management actions.</p>	<p>implementation of actions in the MEM Strategy started in mid-2018.</p>
<p>Process for ongoing review, evaluation and refinement</p>	<p>-Clear identified need at the beginning of process for inclusion of review and evaluation phase. -No specific framework (e.g. established adaptive management) in place.</p>	<p>Designed to have ongoing review of the Marine Estate Management Strategy. Includes the establishment of a Marine Integrated Monitoring Program that includes ecological, social, cultural and economic components, and will have formal 5 year check using risk assessment framework (outcomes and program implementation evaluation). Also, reviews of individual sectors will feed into that.</p>	<p>Establishment of a Marine Integrated Monitoring (MIM) Program and framework that included ecological, social, cultural and economic components.</p>	<p>The MIM program and framework provides the structure required for review and refinement of management initiatives.</p>	<p>The MEM Strategy has specific actions relating to review and performance evaluation that are incorporated into a Marine Integrated Monitoring Program (i.e. step 5 in MEMA five step process). The full framework that integrates environmental, social, cultural and economic components is due in 2019.</p>
<p>Effective resourcing, capacity and tools</p>	<p>-The relevant objectives were recognised and existed in some legislation and policy architecture. Increasing stakeholder awareness for social and economic objectives. Beeton audit highlighted the need to have greater focus on social, cultural and economic attributes. -Absence of information for how to include social and economic objectives (relative to biophysical guidance), and how to identify how best to</p>	<p>Marine Estate Community Survey (2014) – this survey was conducted early in the process to assess the benefits that the community derive from the NSW marine estate, and what they saw as the key threats to those benefits. (Brooks and Fairfull and Jordan et al papers describe process and results) A detailed and integrated threat and risk assessment was conducted to quantify the level of threats and risks to the marine estates</p>	<p>The MEMA threat and risk assessment includes distinct ecological, social and economic components. These are then reflected in the Marine Estate Management Strategy which contains initiatives and actions that address all components, and focusses on community benefits.</p>	<p>Explicitly multi-sectoral, and triple bottom line, with an overall objective of considering all activities and relating threats to benefits that the community derive from the marine estate. These will be assessing with a wellbeing framework.</p>	<p>The Marine Estate Management Strategy has defined initiatives that integrate environmental, social, cultural and economic objectives. Includes specific actions that identify monitoring and evaluation of relevant management actions and the strategy. Stakeholders have been engaged in the development of the Strategy.</p>

	integrate environmental, social, cultural and economic. Little recognition of Aboriginal cultural heritage. Little economic information e.g. value of recreational diver sector and variable measures (e.g. commercial vs recreational value measures).	environmental assets and community benefits.			
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Beeton, R. J. S., Buxton, C. D., Cutbush, G. C., Fairweather, P. G., Johnston, E. L., and Ryan, R. 2012. Report of the Independent Scientific Audit of Marine Parks in New South Wales. NSW Department of Primary Industries and Office of Environment and Heritage, NSW.

Appendix 3f – Progress toward IM in South Australia and the Spencer Gulf.

	Preconditions and drivers of change	Intentional design + rearrangement	Enablers of/ barriers to change	Features of resulting IM	Evaluation and modification
Recognition of the need for IM	<ul style="list-style-type: none"> -Government departments didn't have a strong interest in progressing integrated approaches. -Recognition of need from science and industry in the context of proposed developments including mining, ports and desalination plants. -The industries reasoned that unless they all pulled together there was risk in their industry (there might otherwise be an accident for one of the operators). Prawn fishers were concerned that impacts of development on their sector weren't being taken into account, and there were community concerns around potential impact of developments on iconic species (e.g. cuttlefish). -Recognition by industry that conflict between sectors had to be sorted rather than playing out in the media. 	<p>Impetus created for 'SGEDI' (Spencer Gulf Ecosystem & Development Initiative) that was put in place by University and SARDI. Seeing what was happening with the mining industry that was growing quickly (growing from 5 to 20 mines in a short period). SGEDI was established (2011) to bring together a group of institutions/interested parties that were wanting to do something integrated. SGEDI structure setup with industry, government and research stakeholders.</p>	<p>University of Adelaide and SA Government convinced mining/ports industries of the need for SGEDI initiative and initial investment (including through fishing and aquaculture industries via FRDC). DSD involvement through Olympic Dam Task Force and engagement with mining companies etc. High level networks with industry players also assisted in garnering interest – relationships important. Resources Infrastructure Taskforce – identified potential port options for the region. Changing circumstances were disablers (like the drop in iron ore prices in mining).</p>	<p>Urgency lost when iron ore prices declined; less need</p>	<p>There was some positive pre-condition and some negative but the recognition of the need was insufficient in government. Only now is there further potential interest from government to look at IM in the joint Goyder/FRDC/SGEDI funded project where Goyder provided need for Steering Committee around project. There was enough recognition of need to have a workshop in 2015 and report was produced and presented to government and SGEDI etc, but not sure who that was distributed to. Majority of participants in workshop funded through SGEDI, with some input through FRDC. Government investment has come in now to fill void from reduced investment from industry stakeholders.</p>
A shared vision for IM					<p>There was no clear shared vision for IM. Workshop in 2015, SGEDI players interested, embryonic view of vision for what integrated management in Spencer Gulf might look like. Some government people attended workshop (e.g. transport), but not high level engagement.</p>

<p>Appropriate legal and institutional frameworks for coordinated IM decision-making</p>	<p>-There is no obvious legal framework or legislation. -Recognition of need for multi-stakeholder and need for integrated approach – for specific issues (e.g. cuttlefish). -There are also other examples throughout South Australia (e.g. oyster-reef restoration; may also be around POMS, long nosed fur seals in Coorong). So the crisis is the driver.</p> <p>-Strong single agencies, single sector management frameworks, but some recognition of need across Acts (fisheries and marine parks). Lack of legislation, policy or governance frameworks to support IM (lack of structure / framework).</p>		<p>There is further funding and a steering committee is established but overwhelmingly government based whereas the board is largely industry based. Two groups – 1 = government dominated (marine managers forum) 2= industry community. They have to now work together.</p> <p>Urgent issues force people to break down siloes.</p>	<p>NA</p>	<p>NA</p>
<p>Sufficient and effective process for appropriate stakeholder consultation, engagement and participation</p>	<p>Range of key industry and government stakeholders at the table.</p> <p>Fear of consultation overload at the community level.</p>	<p>SGEDI had diverse participation. SGEDI now has management board that has independent chair with representatives from industry, community and government. There is some tension around appropriate stakeholder participation (some see it as too much government but it is also active government participation). But now there are two groups (one government dominated and another that is industry and community).</p>	<p>Evidence of individual personalities have influence in enabling or disabling progress (they have a large part in the success or otherwise).</p>		<p>SGEDI been important in bringing stakeholders together. Increased participation through the new process (Goyder process) is a good sign.</p>

<p>A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.</p>	<p>Industry interest in a more comprehensive approach to making information more available.</p> <p>Confidentiality of data owned and collected by industry (including fisheries – it can be hard to access fisheries information held by SARDI) so some limitations on current data use. Access to data can also be a problem (e.g. SARDI held data).</p>	<p>There is not a commonly held set of objectives, but there is a process in place in the next phase that aims to set objectives and processes. If objectives are not identified then there is a risk that it will be very bio-physically oriented.</p>	<p>Blue economy access economics report was prepared that is specific to South Australia, but because of Spencer Gulf interest, the information is available at Spencer Gulf resolution</p>	<p>Goyder project specific sectoral objectives can contribute to IM</p>	<p>Some data sharing has eventuated between industry because they saw individual benefit to doing this.</p>
<p>Explicit consideration of trade-offs and cumulative impacts of multiple activities</p>	<p>Recognition and cumulative impact are important. Additive approach might not be best approach – but what different sectors like is that there is a spatial view (which is easy to visualise).</p> <p>Lack of spatial data layers for some of the threats. Tools and data for cumulative impacts are limited – which then results in an additive approach. (This can be a negative aspect)</p>	<p>Last phase of SGEDI was aimed at assessing cumulative impact (and mapping) based on the risk analysis that was done before. Some ongoing work is ground truthing that work and modelling synergistic impacts.</p>	<p>A person was pushing cumulative impacts and they were keen to develop it.</p>	<p>NA</p>	<p>Cumulative impact map have been created but don't know if high stress areas are indeed that. The maps are not used much for planning. There are large areas that are relatively un-impacted</p>
<p>Process flexibility to adapt to changing conditions.</p>	<p>There is a champion and a person who has been there constantly through the whole process – so they have kept the thing going. The flexibility of people coming in and out with a 'solid' core makes it able to continue. (This is a positive)</p>	<p>NA</p>	<p>NA</p>	<p>NA</p>	<p>Reduced funding and reduced need makes the process quite flexible. This was not the only project as there were other things to go on with. But the good thing is that it is still going – that is also the reason to keep the board going. If the board was to go into hiatus it might become disengaged. End of the mining boom was a change of condition which was partly negotiated. The visions were downscaled from original plan and it was adapted accordingly.</p>

<p>Process for ongoing review, evaluation and refinement</p>	<p>N/A because there was no established process in place. SGEDI did a performance evaluation once. There has been external review in the guise of peer review publications. There are also reports that are in the public domain. Aim is to get as many reports out as possible.</p>	<p>Review by the board of SGEDI of what the research had done to date (output, inputs, advantages to industry). Review was ad-hoc and it was mentioned that it was worth continuing it on.</p>	<p>Stakeholder workshops were held with different sectors and various ports were visited. All the councils were approached as well as a separate process. So many different groups were asked what their vision for the region was. The numbers declined a bit on the second round of visits. Community talks indicated that if the immediate topic was around something they were interested in (like cuttlefish) the event attracted the people. If the topic was around more general information there was less interest.</p>	<p>NA</p>	<p>Several development approvals that have come in from Canberra have stipulated that they need to engage with SGEDI.</p>
<p>Effective resourcing, capacity and tools</p>	<p>-Application and use of existing tools and approaches for specific projects around certain aspects (but they are all around individual smaller scale projects). Also tools were available for mobilising data and data existed. -There is no recognised IM funding agency (e.g. and “RD”) for industry to put money into. The existing RDs are for specific sectors. ARC funding is also hard to access reliably. Should be easier now with the “impact agenda”.</p>	<p>-Specific projects around certain aspects (Ecosim/Ecopath model – or modelling of ports and shipping project – habitat risk assessments – time series of data and spatial mapping for industry) applying existing tools (as in 5A)</p>	<p>Bring different groups together and Funding by several industry partners (money from mining with matching funding from FRDC).</p>	<p>Partial development of some (pilot) tools that can be used to facilitate IM (e.g. the mapping tool – where is the best place to put a desalination plant or where to best grow aquaculture sites)</p>	<p>Building increased capacity and understanding</p>

Appendix 3g – Development of Northern Prawn Fishery Management.

	Preconditions and drivers of change
Recognition of the need for IM	<p><i>Drivers</i></p> <ul style="list-style-type: none"> -Amendments to Fisheries Management Act have been made to include Indigenous rights and recreational interests in management of the fisheries. -Agriculture, especially Northern Waters Projects is likely seeing some stakeholders think about IM. Water extraction is thought to have a strong potential effect on fisheries and thereby might encourage a move to IM. -A push to develop the north (Northern Development Plan) is already a stimulus for discussion at RAGS. This push is broader than MPAs, when fisheries was asking can we fold a range of species and issues in. In the face of the size of agriculture industry and further development, fisheries are becoming aware that they need to make a stronger case than just “we bring in this amount of money”. -There is also a need to navigate the implications of sea country claims and political commitments regarding Indigenous access. This will need careful attention given the need for equity and the legal standing of existing licencing arrangements. <p><i>Constraints</i></p> <p>Fisheries members may be reticent to be involved in a broad IM process through concern over disruption to what is seen as a well-managed fishery. Experience from elsewhere suggests that this may mean some industry members will favour the status quo. The acceptance of the need for IM by Indigenous and other groups (e.g. eNGOs) is currently unclear (as there has been no discussion of the topic). As a result there will be a need for a careful and intentional design</p>
A shared vision for IM	<ul style="list-style-type: none"> -AFMA leadership (extends from Minister, CEO and executive managers) provides fisheries perspective (focus on regulatory aspects). - It can be challenging to get common vision with other agencies and interests. -Social objectives are being driven from bottom up – with little or no direction from the relevant department. AFMA cannot proceed without direction on objectives (any management agency requires clear objectives to work toward for it to take appropriate actions). -Indigenous considerations are top down direction due a legislative requirement (but its implementation needs consultation and engagement to meet the needs of all concerned) -NPF fishery MSC certification influences considerations
Appropriate legal and institutional frameworks for coordinated IM decision-making	<p>Fisheries Legislation Amendment (Representation) Bill (FLAB) to the Fisheries Management Act (directly driving first steps to IM)</p> <p>Native title sea country claims emerging, their role in the future shape of the fishery is still being worked out – it does however mean there must be consultation</p> <p>State-territory/commonwealth jurisdictions arrangements are already agreed – through the Offshore Constitutional Settlement, all under the responsibility of AFMA</p> <p>ERA as a current focus and is stepping stone to IM</p> <p>Co-management in fisheries (between government and industry) is a stepping stone to IM, and a vehicle for greater ownership by the stakeholders (entry point for social objectives into the industry)</p>
Sufficient and effective process for appropriate stakeholder consultation, engagement and participation	<p>NPF has had an ongoing invitation for indigenous stakeholders, but there is recognition that existing processes can be challenging for the entry and participation of ‘new’ stakeholders. Established processes not on equal footing due to the power differential of established participants who are familiar with the processes versus new entrants who are not familiar with the processes/protocols (what is involved, how to contribute etc.). RAGS & MACs already brings together science, industry and management – this will have to be expanded to include other interests. Already a direction for each MAC & RAG to create 2 extra places and active encouragement for additional people to join these and fill the 2 positions (advertised publicly)</p> <p>Ensuring the appropriate representation with indigenous communities and recreational groups (the traditional fisheries management process has had a preference for a peak body to represent a sector/interest group, but this may not be compatible with how Indigenous representatives would be most comfortable engaging given the cultural structures inherent in indigenous governance and their connection with the land/sea)</p> <p>From the northern water project, fisheries recognise the need for consultation across sectors not just within (this is a typical learning step that is shared across all cases where single sector shifts on to a broader landscape – e.g. the expansion of stakeholders involved in GBRMP discussions)</p> <p>Experience in the fisheries system with regional marine planning exercise – having gone through a contentious process already (MPA designation) and this may mean there is less/low fisheries stakeholder appetite for IM (given potential concern over engaging in another process that could be contentious given the need to negotiate about trade-offs etc; this has certainly been the pattern elsewhere, though immediate pressure may create greater impetus to engage).</p>

<p>A common, comprehensive suite of specific objectives across sectors/activities, and a process to assess those objectives.</p>	<p>Most sector plans or interests recognise triple bottom line within their own sector, but not recognition of interplay among the sectors/interests. Like all Australian fisheries, NPF is strong on some, but not all, social objectives (in large part because social considerations are a relatively new aspects to Australian fisheries and so have yet not had time to achieve equal consideration). It is likely that not all stakeholders will look at/define the objectives in the same way. The definiton, articulation and prioritisation of objectives is not common across sectors (as their objectives can differ substantially). Co-management itself is a major social objective – and one being addressed effectively Some social objectives are potentially already being absorbed /captured within existing ecological objectives (see language/definitional point in intentional design) Need further consideration of distribution of benefit and equity. Building social objectives may be a productive pathway to consider IM A common language/definitions of objectives needs to be developed (similarly nearly everything needed across the different perspectives and disciplines) A practical discussion about equity and how to define and deal with this could be a pathway to IM - defining equity and creating it within the objectives (this has certainly become a growing priority in fisheries globally as there are few places that deal with it well and Australia is no exception).</p>
<p>Explicit consideration of trade-offs and cumulative impacts of multiple activities</p>	<p>Ecological Risk Assessments level 1 in fisheries (which have been carried out for the NPF) do consider impacts of multiple activities - e.g. for bycatch recreational or other species are attended to through Fishery Management Plans (FMPs) Through FMP Act AFMA accounts for conservation impacts through by-catch (to meet EPBC requirements) AFMA has IPAs which lay the ground work for spatial management – those involved in the management of fisheries know they’re there, but are as yet unsure what the implications are. IPA program does present well established structures to work with A lot of actions taken by AFMA have been because they’re important to the fisheries economically (risk assessment for fisheries) Fisheries management is just starting to look at cumulative impacts – driven by fisheries interests, not only ecologically focused. This will form a useful starting point AFMA currently focuses on multiple goals rather than cumulative impacts per se The need for a unifying factor in the IM process might pose a risk for commercial fisheries depending on what are ultimately judged to be drivers in the system and depending on the form of trade-offs recognised. This underlines the need for engagement and the need for a process to transparently handle trade-offs. The first step will be getting all parties (e.g. across sectors, community etc.) on the same playing field before approaching cumulative impacts</p>
<p>Process flexibility to adapt to changing conditions.</p>	<p>Given the stultifying effect of over regulation and complicated layered legislative and policy requirements, there are concerns about whether sea country claims will make fisheries management system feel inflexible, this highlights the need to deal with the new considerations with care and transparency IPAs are a strict form of spatial management Only within commercial fishing efforts: Effort allocation allows flexibility across what and how you catch, within seasonal constraints, and there are triggers that make it variable – established process for managing change (at moment only applied at seasons and gear and bycatch reduction devices). Harvest strategies set up a clear process for managing change with regard to fisheries A progressive change-ready fisheries, demonstrated flexibility and openness e.g. bycatch technology and scientifically</p>
<p>Process for ongoing review, evaluation and refinement</p>	<p>ERA process has a ~5 year review; Fisheries Management Plan has ~10 year review period; Regulations, 5-year and annual research plans - These all may create opportunities for reviewing more broadly - Build in consideration of IM elements to these existing review points.</p>
<p>Effective resourcing, capacity and tools</p>	<p>-So far no direct funding to implement the Fisheries Management Act amendments, departments are already facing funding limitations and are having to turn away non-core requests (e.g. for engagement from the oil and gas industry) -Willingness and consideration for regionalisation of AFMA (i.e. locating offices in regional areas) MACs & RAGs might become willing to talk with other interests (Broader decentralisation of policy offices may be an enabler if the Government decides to fund it) -Huge area, effective resourcing is a big demand -Long standing research partnerships and relationships in place; Data and focused research available, very strong base to build on (scientific survey by the NPF fishery telling us about regional patterns in species distributions; the fisher has information that can be contributed to understanding impacts on the area). Observation coverage in the area may increase - IMOS recognises lack of monitoring in this region and is trying to get more capacity – that’s good because it would allow for assessments of the progress against objectives e.g. water quality -Potential to use spatial planning tools to integrate additional IM elements -There are efforts to ensure resources are available for other interests, especially Indigenous interests, to attend and engage -Demands for new data when integrating traditional, commercial and recreational interests.</p>

