UNDERSTANDING THE INFLUENCE OF MEDIA NARRATIVES ON GREAT BARRIER REEF WATER QUALITY MANAGEMENT

RP227: FINAL REPORT

A report provided to the Department of Environment and Science, Office of the Great Barrier Reef

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Front page image

Courtesy of the Great Barrier Reef Marine Park Authority, image library. Aerial photo of Hardy Reef, located in the Whitsunday region – circa. 2014.

Abbreviations

AIMS	Australian Institute of Marine Science
DAF	Queensland Department of Agriculture and Fisheries
DES	Queensland Department of Environment and Science
DOR	Queensland Department of Resources
GBR	Great Barrier Reef (the Reef)
GBRMPA	Great Barrier Reef Marine Park Authority
HDRDI	Human Dimension Research and Development Initiatives
MCL	Media Communication Lab
NQDT	NQ Dry Tropics
NRM	Natural Resource Management
OGBR	Office of the Great Barrier Reef
RWQIP	Reef 2050 Water Quality Improvement Plan
RWQ	Reef Water Quality
QRWQP	Queensland Reef Water Quality Program Queensland Government's Reef Water Quality Program
ToC	Theory of Change
WQ	Water Quality

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Executive summary

There is limited knowledge about how the many actors involved in Great Barrier Reef (Reef) water quality communications shape mainstream media narratives. To date, the role of traditional mainstream and social media in building awareness of important environmental issues facing our society is underexplored, including in the context of the Reef. Research suggests that media including social media are emerging as particularly important in building social capital – the basis of social networks – in rural, regional, and remote communities. Land managers are increasingly using social media to share and gather information about their industry. However, there is limited research conducted to date to assist understanding how traditional or social media are shaping outcomes associated with the Reef. Improved knowledge in this area provides an opportunity to use narratives (particularly through traditional and social media mediums) in a positively framed capacity to drive improved outcomes for the wider social good: the health of our Reef.

Media here refers to print, broadcast, community outlets and social media, from both industry (journalists, editors, news outlets), professional individuals and groups that form partof the media narrative through user-generated content via social media. There have roughly ten studies on the media and the Reef more broadly. However, the literature on media and Reef Water Quality (RWQ) is very limited.

Objective

The findings and outcomes of this report intend to establish a baseline for future research by identifying how and why existing media narratives influence our understanding of RWQ issues.

Aims

The overarching aim of this project, 'Understanding the influence of media narratives on Great Barrier Reef water quality management (RP227)', is to build a clearer picture of the identified media system around RWQ narratives and provide guidance and tips to Reef protection agencies and other stakeholders. The project will achieve this, with an overarching aim and three sub-aims.

Overarching aim

1. To build a clearer picture of the media system around RWQ narratives to better strengthen links with stakeholders.

   1.1. To establish a baseline understanding of Reef water quality media narratives,
   1.2. To find standard communication practices and challenges (synthesis/analysis) in Reef water quality media narratives, and
   1.3. To seek solutions and find future pathways for best practice in communicating water quality narratives for behavioural change.

Benefits

This report will benefit managers and communicators in the Great Barrier Reef catchment and the wider arena of environmental management, communication, and policy development.

The creation of these multiple datasets enabled similarities and differences of issues and practices between participant groups to be identified. The multiple data sets also aided the discovery of *why* effective narratives by RWQ leaders are, or are not, occurring in the RWQ media narratives.

Project contribution to the Reef 2050 Water Quality Improvement Plan

This project addresses the RWQ communication knowledge gap to understand how media narratives contribute to the *Reef 2050 Water Quality Improvement Plan* (RWQIP). The RWQIP includes objectives to improve land management, increase a culture of stewardship amongst land managers, and has targets for best management practice adoption with human dimensions targets to increase the active engagement of communities and land managers in programs to improve RWQ outcomes.

This project contributes to the Reef 2050 RWQIP objectives of maintaining viable communities and improved governance in how it is identifying the existing water quality media narratives. Our development of practical tools for government-based stakeholders, marine park managers, media outlets and end users to align better the commentary between groups around behaviours aimed at improving water quality in the Reef. Having a better understanding of media narratives contributes to the 2025 Human Dimension target recommending better policy and program decisions (informed by the learnings of this project) to extend the reach of programs that seek to engage natural resource and land managers. This challenge builds on existing practices, contributing, and has identified the drivers of narratives (both physical and Meta). In doing so it achieves its primary outcomes of that could results in a culture of innovation that can enhance and encourage new modes of stewardship, and feedback loop into the producers and consumer model.

This report is a response to a recognised need by Reef protection agencies to investigate past and current practices and learn how to bring about change and achieve the common goal of Reef health. The leadership demonstrated by OGBR in supporting this innovative forward-thinking approach, is an important first step in the change process.

What are the main media (traditional and social) narratives?

Media narratives located in this project, during the scoping timeframe are categorised as 1) the central RWQ media narrative, and 2) narratives about RWQ narratives to provide meaning, 'meta-narratives'. The central narrative includes traditional and/or social media content about RWQ, may relate to changes in RWQ, possible causes for these changes and actions proposed or being taken to address them.

The **meta-narrative** relates to **the media characterisations of the narratives themselves**, that is, they reflect an awareness and knowledge of what is being said about RWQ in the media, how RWQ stories are told and by whom. These meta-narratives are embedded in and reflect media processes and practices that influence *how* and *why* media stories are produced, positioned and circulated.

> *"Water quality [means] that you're not sending nutrient sediment, pesticides, and God knows what out to sea. To include that in water quality, I know it's probably not stated in stuff, but all the plastic and all the rubbish is also a contributor to water quality because plastics and can land on things on the Reef, it can kill, you know, the micro plastic that's killing all our – you know, they're eating micro plastics and killing it,"* (far north Queensland land manager)

The central media narrative identified under this project is:

Reef water quality and status of reef health is uncertain

The main meta-narratives include:
- Importance of the science is eclipsed by political agendas,
- RWQ stories are framed around conflict to generate revenue,
- Media coverage of run-off/water quality (if reported at all) focuses on plastic pollution and gully erosion, rather than for other RWQ issues e.g., land management, enhanced stewardship,
- Negative media stories (actors perceived as adverse in RWQ responsibility and outcomes) is impeding funding, engagement and association thereby aiding misinformation, and
- RWQ regulation is challenged by

> *"If it's [a story] not generating page views, and subscribers, then it's something that we're less likely to write about. …But the amount of environment news that we do, or **water quality news or anything like that is driven by the amount of people, reading that. So that is one of our main drivers at the moment, and probably one, I don't think we've probably done as much work on that water quality.** Obviously, we do a bit with the cane farmers, because they've got an interest in speaking out against it and this bit of political sort of political arggy bargy in that space. …unless that's something controversial, probably won't get as much go …that's in a new online world anyway"* (North Queensland editor).

misinformation.

We consider these findings in relation to the RWQIP objectives and suggest actions to strengthen this position, along with practical tools to assist those actions, in parts two and three of this report.

Who are the main actors identified in the RWQ media narratives?

Many people contribute to constructing, shaping and circulating narratives about the Reef, whether intentionally or inadvertently. In this project, we found the **main actors producing RWQ narratives were journalists (through media professionals) and industry (via ports, cane and agriculture)**. The main sources media actors rely upon for information to generate stories within the RWQ narrative are industry and environmental groups, such as ports, NRMs, conservation groups, and local grassroots-based environmental organisations. We categorised these narrative participants into four (4) sectors.

Those sectors are:
- Local-level environmental and national conservation groups (terrestrial and marine),
- Industry and peak bodies (sugar, bananas, agriculture, ports, tourism, beef and energy resources),
- Farmers, graziers and land managers, and
- Journalists/editors and newsroom chiefs of staff.
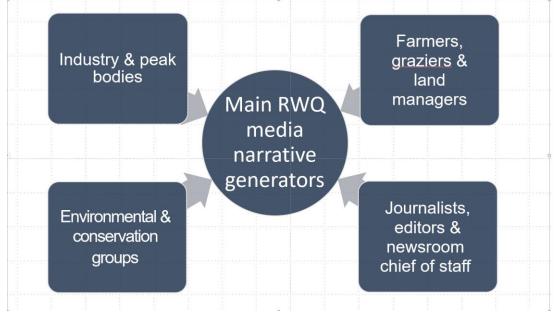
FIGURE 1. MAIN PRODUCERS OF REEF WATER QUALITY MEDIA NARRATIVES

Community media taken from industry-related land management organisations found that community narratives might influence RWQ management practices. However, the focus of the discourse is on many other aspects of the Reef, with little emphasis on water quality management. Given the small sample, we can only surmise that the strength of the messaging may be weakened.

What is the significance of understanding the influence of media in Reef Water Quality narratives?

It is important to understand RWQ media narratives to be able to fit with the RWQIP objectives of maintaining viable communities and improved governance. In identifying the existing water quality media narratives, it is equally important to understand the RWQ narratives are not produced in isolation, but part of a larger Reef water system that frames those narratives.

The RWQ system includes, Reef protection agencies and investors, traditional and social media producers and land managers. This report identifies the **who** and **what** are the main media narratives, as well as observations on what is currently missing from or underrepresented within the media narrative.

To better understand the implications and uses of these findings, we have developed a framework that identifies how the system (i.e., media processes and narratives) works to produce RWQ media narratives. The two narrative types described above, (the central media narrative and the meta-narratives) and the media processes and practices represent two distinct yet interconnected parts of a RWQ 'media system' in **Figure 2**.

At the core of this system (light green box (centre) is the central RWQ narrative, encircled by and connected to various meta-narratives (inner dark green circle/boxes) that were identified in this project. These in turn are encircled by and connected to a range of media process and practices (outer orange circle/boxes) that influence narrative dynamics. The arrows show the connections between the narratives, meta-narratives and media processes and practices.

This report follows the conceptual structure in **Figure 2** as developed from this project with the following outline:

- **Part One:** Outlines the steps taken to identify the central media messaging and meta-narratives. This part includes the broad findings from this project by dataset (academic literature, grey literature, traditional media and social media). This includes the narratives, their content, and their proponents (what is being said about RWQ, and by whom). This is followed by a set of evidence-based responses that can better understand RWQ media narratives.
- **Part Two:** Provides a practical approach to navigating the systems through the framework developed here.

Parts One and **Two** sit within what we define as the Reef water quality (RWQ) media landscape that is made up from the current processes and practices.

Part Three - provides practical advice on how to navigate the RWQ media system in light of the findings outlined in Parts One and Two.

FIGURE 2. **GREAT BARRIER REEF WATER QUALITY MEDIA SYSTEM: CENTRAL NARRATIVES, META-NARRATIVES AND PROCESSES SYSTEMS FRAMEWORK DEVISED FROM THIS PROJECT**

What is missing from the RWQ narratives?

This project identified two major gaps related to the RWQ narratives and meta-narratives. Firstly, there is no **consistent voice** throughout the narrative. Secondly, there is a **'narrative void'** resulting from the Reef protection programs' communication processes needing to meet the needs of a dynamic and politically-charged communication environment. The research has identified some opportunities to strengthen communications for actors in achieving the RWQIP objectives. We consider these findings in relation to the RWQIP objectives and address ways to strength in parts two and three.

No consistent voice: While differences in views are expected and welcomed, in a diverse media landscape without a consistent voice on RWQ issues, audiences are not confident who to trust. This is particularly important in times of uncertainty, crisis and disruptive change. We know from general behavioural literature that trust can be built over time through a lead stakeholder generating narratives that demonstrate a responsiveness to public views, alignment between messages and action, consistency and repetition of messaging, transparency and active collaboration. This observation is important, as this study found that trust was the underpinning barrier to narrative participation for all participants.

Narrative void: In the media systems, we identified three ways the narrative voids occurred.
1. The key actor's voices are missing: Reef agencies and their perspectives, actions and programs are often missing from the media narratives due to slow response times to media requests. Slow responses can be due to unnecessary approval levels, which lags behind media and industry standards. When the response is delayed in a media landscape that changes hourly, a narrative silence results. The silence is quickly filled by other voices, which then shape the dominant narratives. Some sectors of government, feel hampered by the same constraints and seek alternative platforms (for example, podcasts and blogs).
2. Traditional and social media frames RWQ as a conflictual issue- to generate interest or push individuals' political and social agendas.
3. When political biases is embedded in the reporting of RWQ stories. Studies (Bacon, Manne and others) show that editorial often align along party lines, such as News Corp Aus. media's support for Liberal politics.

Framework for navigating the RWQ media landscape

In developing the framework (**Figure 2**), our participatory process and expert elicitation with major Reef protection agencies' communication experts produced a set of recommendations and measures/solutions to working within the media system.

Great Barrier Reef Media system:
central narrative, meta-narratives and processes

Authors ;Newlands, Mahoney and Bohensky (2021)

Conflict frames RWQ news stories to increase revenue and reach

Industry and Environmental groups are the main journalism source

The importance of science is eclipsed by political agendas

Social media amplifies misinformation of RWQ narratives

RWQ stories are framed around conflict to generate sales revenue

RWQIP objectives are challenged by misinformation

Narrative void by RWQ agencies leads to distrust in messaging

Central RWQ Narrative:
Reef Water Quality & Reef health status is unclear

Environmental groups write local focused press releases, published verbatim as news stories

Negative stories are impeding funding & collaboration between RWQ partners

Media coverage of RWQ focuses on plastic pollution & gully erosion over RWQIP objectives

RWQ agencies gatekeeping process slowing down response time to media queries

High number of cadetships in Qld media means less experienced journos, poor relationship and peer pressure to frame RWQ as conflict/political

Narratives: What is being said about Reef water quality (RWQ)

Meta-Narratives: What is being said (in the media) about RWQ narratives

Media processes and practices: How and why narratives are occurring

The inner circle shows **what** is being said in the media narratives; the outer circle relates to the **how** and **why** the narratives are occurring. They are designed as concentric circles to reflect the inner relationship between the what and the why of how narratives are generated

FIGURE 3. A PROGRAM LOGIC APPROACH TO UNDERSTANDING THE BASELINE RWQ MEDIA NARRATIVES AND THE CORRESPONDING RESPONSES AND PRACTICAL

Figure 3 is based on a program logic – a model that sets out the resources and activities that comprise the program and the changes expected to result from them. In this study, the program logic sets out the central narrative, meta-narrative/s, actors and drivers of the central and meta-narratives that form the RWQ media system. The bottom half of the diagram provides a responses and measures that can be taken to recommendations and practical applications that identify potential areas of change, amplifying the call for action, to contribute to the RWQIP objectives.

Responses and recommendations

This project makes the following responses in understanding RWQ media narratives:

BOX 1. THE BOX BELOW SUMMARIZES THE PRACTICAL WAYS TO NAVIGATE THE EXISTING RWQ MEDIA SYSTEM

Response and recommendations

1.1 Reef water quality agencies and investors manage trust of government messaging to reduce misinformation (information not intended to cause harm) and an existing narrative void.

1.2 Reef water quality agencies and investors collaborate with industry, environmental groups and science communicators to escalate awareness of RWQIP and Reef 2050 objectives.

1.3 Reef water quality agencies and investors represent a diverse range of representation (gender, indigeneity, ethnicity, age, etc.) to generate a sense of community ownership is in achieving RWQIP and Reef 2050 objectives.

1.4 Reef water quality agencies and investors amplify existing efforts of sharing success stories that centre on social, environmental and economic success to promote RWQIP objectives and prioritise economic gains for land managers.

1.5 Reef water quality agencies and investors decentralising increase awareness of messaging to a local level to include areas outside of service area issues beyond metropolitan (Brisbane) and regional centres (Townsville).

From these responses and recommendations, we propose the following **practical measures as solutions**:

Practical applications

2.1: Reef water quality agencies and investors increase their use of plain language in their communications to simplify and reach more people with clear messaging.

2.2: Reef water quality agencies and investors make more practical use of social media to counter the conflict narrative and misinformation about Reef water quality.

2.3: Reef water quality agencies and investors increase their engagement with the RWQ narratives by supporting more ways to participate, including the use of social media.

2.4: Communication experts from Reef water quality agencies and investors, develop practical ways to streamline existing approval processes, and increase response times for traditional and social media to participate effectively in the Reef WQ narrative.

Introduction to the Problem, Project Approach and Methodology

Background

We live in a media-influenced world. We learn about society and events through the media. The public gain knowledge from traditional media, social media and industry newsletters. Even if we do not follow the 'news', friends and family will often share information gained through the media. The media system around the Great Barrier Reef (the Reef) and Reef water quality (RWQ) is a complex network, referred to this report as a **RWQ media system.**

This media system sits within a complex network of end-users. End-users include sectors from government agencies, industry and peak bodies, media organisations, communication officers' conservation groups, land managers, public relations companies and non-government organisations. These end-users form an interconnected web of communicators, all with different agendas and opinions.

Understanding how these different media networks interact within the broader 'media system', or 'landscape' can result in an enhanced understanding about how the media influences our knowledge of Reef water quality (RWQ). The benefit of this understanding is that it may become easier for managers, investors and program designers to navigate and direct actions.

> The overarching aim of this project, 'Understanding the influence of media narratives on Great Barrier Reef water quality management (RP227)', is to build a clearer picture of the identified media system around RWQ narratives and provide guidance and tips to end-users.

The project team worked closely with the Department of Environment and Science's (DES) Office of the Great Barrier Reef (OGBR) and the suite of human dimension programs funded under the Queensland Reef Water Quality Program (QRWQP). The *Reef 2050 Water Quality Improvement Plan* (RWQIP) includes objectives to improve land management and increase a culture of stewardship amongst land managers; targets for best management practice adoption, alongside human dimensions targets to increase the active engagement of communities and land managers in programs to improve water quality outcomes.

Identifying the problem

There has been limited knowledge about how the many actors (including, but are not limited to, natural resource management groups, state and federal government, industry, land managers, , journalists/editors, and environmental groups) involved in RWQ communications shape mainstream media narratives. To date, there is an underexplored role for traditional mainstream and social

media in building national awareness of important environmental issues in the context of the Reef and Reef Water Quality Improvement Plan (RWQIP).

Research suggests that social media is particularly important in building social capital (as the basis of social networks) in rural, regional and remote communities. Land managers are increasingly using social media to share and gather information about their industry. However, much of the research conducted to-date has focused on traditional media shaping outcomes associated with the Reef (Coghlan et al., 2017; Foxwell-Norton & Konkes, 2021; Mitchell & Roffey-Mitchell, 2018; Vella et al., 2017). Improved knowledge in this area provides an opportunity to use narratives (particularly traditional and social media) in a positively-framed capacity to drive improved outcomes for the Reef.

Media here refers to print, broadcast, community outlets and social media, from media industry (journalists, editors, and news outlets), professional individuals and groups that form part of the media narrative through user-generated content via social media. There have been studies on the media and the Reef more broadly, however, we found published studies about the media and RWQ is limited.

Project aims and objectives

This project addresses the RWQ communication knowledge gap to understand how media narratives contribute to the *Reef 2050 Water Quality Improvement Plan* (RWQIP).

> **Overarching aim**
> 1.To build a clearer picture of the media system around RWQ narratives to better strengthen links with stakeholders.
>
> 1.1. To establish a baseline understanding of Reef water quality media narratives,
> 1.2. To find standard communication practices and challenges (synthesis/analysis) in Reef water quality media narratives, and
> 1.3. To seek solutions and find future pathways for best practice in communicating water quality narratives for behavioural change.

Aims:

To achieve these objectives we have four (4) key aims:
1. To supply an original account of the RWQ media narrative (across traditional and social platforms),
2. To find key organisations and drivers/motivators of the RWQ narrative,
3. To identify what the RWQ media narrative means for future investment, program design and management, and delivery of the Reef Water Quality Improvement Plan objectives,
4. Produce a set of recommendations and guidelines for end-users in communication within the Reef media ecosystem to promote the social good of RWQ.

The audience

This report is intended to benefit managers and communicators working with stakeholders in the Great Barrier Reef catchment and contributes to the fields of environmental management, communication, human dimensions literature and policy development.

Structure of this report

This report is set out into three parts. **Part One:** Outlines the steps taken to identify the central media messaging and meta-narratives. This part includes**:** Outlines the broad findings from this project by dataset (academic literature, grey literature, traditional media and social media). This includes the narratives, their content, and their proponents (what is being said about RWQ, and by whom). This is followed by a set of evidence-based responses that can better understand RWQ media narratives. **Part Two:** Provides a practical approach to navigating the systems through the framework developed here. **Parts One** and **Two** sit within what we define as the Reef water quality (RWQ) media landscape that is made up from the current practices and processes and practices. **Part Three** – provides practical advice on how to navigate the RWQ media system in light of the findings outlined in parts one and two.

Methodology

The following steps were taken to explore the RWQ media narratives (further details can be found in the Appendices):

1) Locate and review relevant academic and grey literature in the form of a desktop review from a set of databases, through:

    1.1 Using the ProQuest software, a media scrap and desktop review of RWQ and reef run-off media stories via ProQuest (https://www.proquest.com/),

    1.2 A desktop data scrape of the social media platform, Twitter platform using NodeXL (https://www.smrfoundation.org/nodexl/). Twitter was chosen as it's the most common social media platform used by journalists, policy makers and governments.

2) Carry out a series of individual interviews with farmers and media representatives (qualitative research using semi-structured deep dive interviews). Farmers were involved with NRM and non-NRM groups. Journalists were chosen from all platforms – TV, Radio, Print (including online) and both commercial and public service broadcasters.

3) Convene and facilitate a series of media communication labs with journalists, editors, public relations, corporate communication specialists and community newsletters with organisations connected to RWQ in the catchments. RWQ industries included the following sectors:

    3.1 Natural resource management (NRM) groups,

    3.2 Industry peak bodies (agriculture and resources, tourism peak bodies),

    3.3. Environmental groups (local conservation groups and national conservation.

4) A reiterative process of ground-truth the data found at each milestone point. This included feedback loops between the project steering committee, state and federal government Reef protection agencies, and the Reef 2050 communication network, including some media communication lab participants.

Figure 4 describes the flow of information, the creation of data and multiple lines of evidence in this project. The creation of these multiple datasets enabled identification of the similarities and differences between participant groups in their issues and practices as stakeholders in the RWQ narrative. It aided to visualise our data to identify *why* effective narratives by RWQ leaders are, or are not, occurring in the RWQ media narratives.
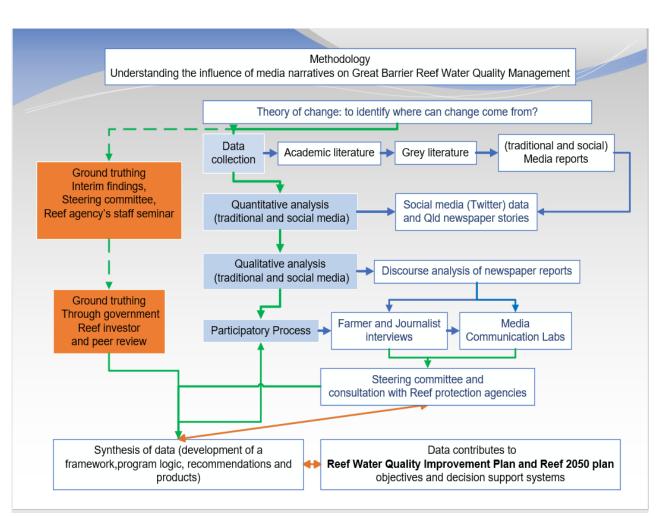
FIGURE 4. SCHEMATIC OF THE PROJECT METHODOLOGY

Program Design: A Conceptual framework

We began this work by developing a Theory of Change (ToC) for the project. A Theory of Change describes a vision of change and the assumptions about the sequential relationships between interventions and change (Wholey et al., 2010). Often conducted iteratively and as part of a participatory process, it can encourage a project team or stakeholders to reflect, challenge and modify their assumptions about cause and effect (Vogel 2012, Bours et al. 2014) and the outcomes that link project activities to impact (Kuby 1999).

ToC is often used alongside, or in place of, other tools like program logic. A ToC is:
- explicit about assumptions,
- lays out pathways to impact, and
- is concerned with longevity/legacy effects, i.e., what happens **after** the project as a **result** of what happened, or what was enabled, **during** it.

The project team built an initial ToC with an aim to help advance a shared understanding of the role media narratives play in Reef water quality management. As expected, most of the project work was located in Phase 1. Potential change that follows from this work will become evident as actions are taken up through policy and program development (Phase 2) and implementation, adoption and scaling (Phase 3).

Figure 5 below includes the three phases, culminating in a collective goal to navigate towards, and the pathways and intervention points that the project team and end-users may be able to lead, shape or support; including those requiring other actors who are currently external to the project.
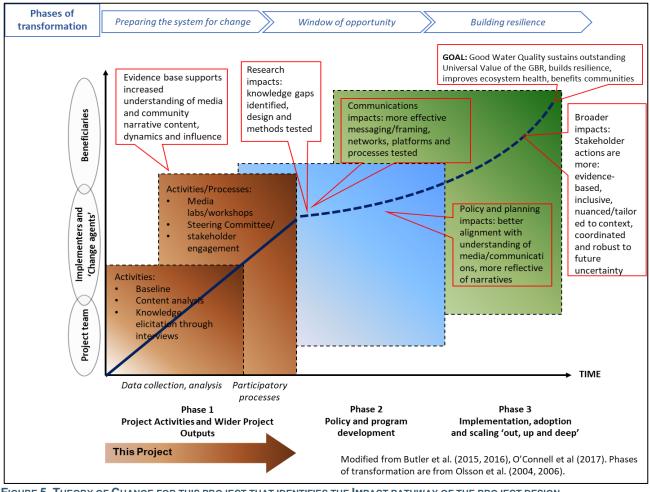
FIGURE 5. THEORY OF CHANGE FOR THIS PROJECT THAT IDENTIFIES THE IMPACT PATHWAY OF THE PROJECT DESIGN

As the project has progressed, the need for shared understanding and sharpened focus around what narratives currently, or could, influence became increasingly clear. One challenge we anticipated, and confirmed through our initial literature review, is that most work on media influence does not reflect a strong tradition of ToC thinking, with the exception of Stachowiak (2013), who discusses both policy windows (e.g., Kingdon 1995) and media influence (McCombs and Shaw 1972) under the broader headings of 'Agenda-Setting Theory'. The incorporation of such thinking is important, so that media studies can better inform the opening up of "windows of action for decision-makers" (Smith and Lindenfeld 2014, p.190) and to identify change agents and avenues for change.

Systematic review of academic and grey literature

In the first methodological step, we located and reviewed relevant academic and grey literature in the form of a desktop review. Grey literature is materials and research produced by organizations outside of the traditional commercial or academic publishing and distribution channels.

The academic and grey literature search included the following criteria:
- Web of Science and Scopus (academic), and Google and DuckDuckGo search engines (grey literature),
- Timeframe of 2014 to 2020, and
- The search string "great barrier reef", "media", "news", and "water quality".

Desktop review summary

As suspected before we embarked on this task, the academic and grey literature around Reef water quality and media narratives was found to be limited. We have identified key contributions in this space to related, though diverse, aspects of human dimensions research which may point to commonalities with our study of media narratives. Therefore, new empirical data was required to fill in the gaps from academic and grey literature. We also needed to establish what the media was saying about Reef water quality. Using the software ProQuest we ran a series of search string terms that were similar to the academic and grey literature searches. Our search parameters were "Great Barrier Reef" AND "water quality". Our search criteria include the terms "Great Barrier Reef" and then a series of keywords (see **Error! Reference source not found.**) between the years 2013 and 2020. This timeframe was chosen to reflect changes in the Queensland Government governance, including the creation of the Office of the Great Barrier Reef and shifts in Reef related regulations and funding. Only Queensland based outlets were used in this study. A total of 15,825 articles were found, and after the removal of any duplicate or irrelevant stories, we had a total of 2063 articles. We then removed references to coral bleaching (456) as that was linked more to climate change impacts, than land management. Total sample of articles was n=1607.

Key terms – all terms begin with "Great Barrier Reef" and	2013	2014	2015	2016	2017	2018	2019	2020
Agricultural run-off AND water quality	22	41	24	32	34	55	93	11
Coral Bleaching AND water quality	29	23	15	127	107	89	55	11
Grazing AND water quality	12	20	34	43	48	32	90	16
Land managers AND water quality	14	4	10	13	6	12	7	1
Reef 2050 plan AND water quality	7	32	34	34	27	25	17	1
Mining run-off AND water quality	1	0	0	0	0	0	0	0
Nutrients AND water quality	21	38	43	53	61	36	67	8
Pesticide AND water quality	41	46	47	73	38	49	67	14
Pollution AND water quality	42	50	49	59	47	50	62	10
Yearly totals	189	254	256	434	321	348	458	72

A similar process was carried out using the same terms in the twitter data search. From here we took steps three and four – original qualitative data from a series of interviews. There were 14 interviews with journalists, and 24 interviews with farmers. There were 4 media communication labs as part of the participatory process and then feedback loops between the departments and steering committee members. This brings us to the participatory phase of the project design. Figure 6 below summarizes the participatory process.

Participatory process

To generate the new data, we engaged in a participatory process with interviews and media communications labs. The aim of these labs – structured similarly to a focus group – was to broaden and deepen our understanding of the RWQ narratives, their influence, and participants' experiences with shaping, interpreting and operationalizing narratives in policy and practice by talking directly with those generating RWQ media narratives. Figure 6 shows the final number of participants in each step of the data collection.

SNAPSHOT
Demographic range of media interviewees:
- Industry experience ranged from six (6) months to 40 years in various journalism-based industry roles,
- Gender balance was near equal, with 54% female and 46% male participants,
- Indigenous journalists and journalists working for Indigenous news outlets (print and community) with over 50 years' experience were also part of the sample, and
- Journalists ranged in age from early 20s to early 70s.

Table 2 provides an overview of the types of stakeholders engaged and **Figure 6** shows the composition of the qualitative data sourced.

Traditional Media (journalists including freelance, editors)	Farmers (cane, beef/dairy, horticulture) and NRMs	Industry (media, communications, managers, policy advisors, CEO, Corp Affairs)
• **Local newsletters** • **Indigenous news** • **Print** • **Radio** • **Television** • **Commercial and public service broadcasters** • **Subset: social media**	• Cape York NRM • Northern Gulf Resource Management Group • Terrain • NQ Dry Tropics • Reef Catchments • Fitzroy Basin Association • Burnett Mary Regional Group	• Resources • Farmers • Ports • Industry groups e.g., Canegrowers, AgForce • Tourism • Horticulture • Sugar • Beef • Fertiliser
Snowball sample (from researchers, stakeholders and participants)		

Media interviews
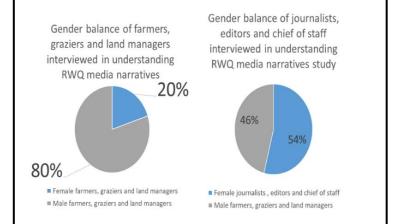
Interviews with journalists took place between December 2020 and February 2021. Within the 14 journalist interviews there were several chiefs-of-staff and editors.

Each interview ranged between 40 and 90 minutes, covering topics in great detail to maximise depth in the dataset for analysis.

FIGURE 6. PIE CHARTS DEMONSTRATING GENDER EQUITY IN THE PARTICIPATORY PROCESS OF THE PROJECT

The sample included a broad range of industry experience, from six months through to 40 years. Also included were journalists working for Indigenous news outlets (print and community). There was an approximate balance of gender participants with 54% female and 46% male – see figure 6.

QUALITATIVE DATA SUMMARY

This is the composition of the qualitative data sourced.

TOTAL INTERVIEWS
These participants were either interviewed directly, or contributed as part of media communications labs.

63

JOURNALISTS
These 14 interviews were with journalists, editors and newsroom chiefs of staff.

14

FARMERS
Of these farmer interviews, 14 sourced via snowballing from Natural Resource Management. Ten were sourced via general snowballing.

24

MEDIA COMMUNICATIONS LABS
There were four media communication labs with 25 participants in total from industry groups, NRMs, tourism representatives, conservation/ENGOs.

25

The participants included a mix of media professionals from all different levels and lengths of experience (from junior to more senior staff). By taking this approach we gained abroad impression from those driving the daily news stories and directing the journalists about what topics to cover in stories, to the journalists themselves pitching the stories to management who may be less familiar with the subject matter and broader context.
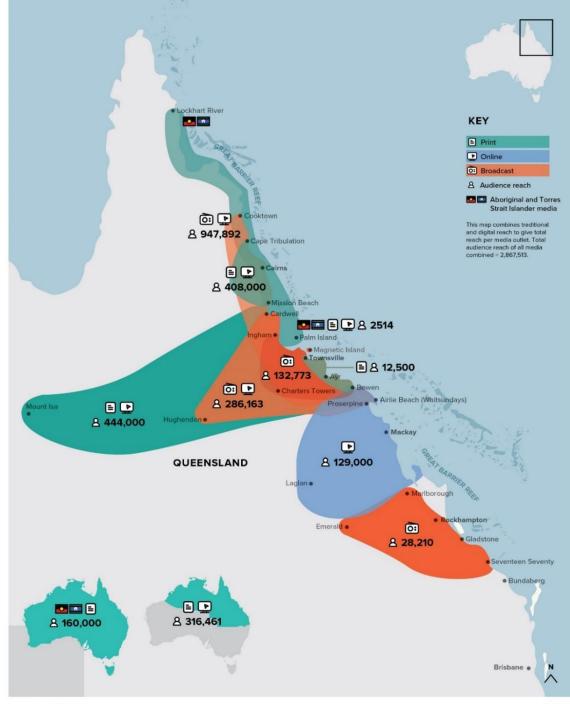
We identified the representation of diversity was limited and this is discussed further in Part Two and Part Three.

Finally, data collection was designed to be representative of the geographical breadth of the GBR catchments.

The geographical spread of those interviewed included all of the GBR catchments from the Torres Strait in the north, Agnes Waters in the south and as far inland as the Tablelands, Charters Towers and Emerald (see Figure 9 below).

FIGURE 7. INFOGRAPHIC OF THE NUMBER OF PARTICIPANTS IN THIS STUDY

RP227 Geographical distribution of journalism study participants and media outlet audience reach

KEY

- 📄 Print
- ▶️ Online
- 📻 Broadcast
- 👤 Audience reach
- 🏴🏳️ Aboriginal and Torres Strait Islander media

This map combines traditional and digital reach to give total reach per media outlet. Total audience reach of all media combined = 2,867,513.

Lockhart River

📻 ▶️ Cooktown
👤 947,892
Cape Tribulation

📄 ▶️ Cairns
👤 408,000
Mission Beach
Cardwell

🏴🏳️ 📄 ▶️ 👤 2514
Ingham • Palm Island
Magnetic Island
Townsville
📻 👤 12,500
📻 👤 132,773 • Ayr
Charters Towers • Bowen
📻 ▶️ Proserpine • Airlie Beach (Whitsundays)
👤 286,163

Mount Isa
📄 ▶️
👤 444,000   Hughenden

Mackay

QUEENSLAND
▶️
👤 129,000

Laglan

Marlborough

Emerald
📻
👤 28,210 • Rockhampton
Gladstone
Seventeen Seventy
Bundaberg

🏴🏳️📄
👤 160,000

📄 ▶️
👤 316,461

Brisbane

N

Source: Regional TAM - Total People - WIN/7QLD/SCA Nine Primary Channels - 1st - 31st March 2021 - 0200-2600 & 1800-2400 - Consolidated 7 - Townsville & Rockhampton - Average Audience (AUD)
Source: Xtra Insights, Commercial Radio Australia – survey period: 14th October 2019 – 2nd November, 2019
All other data was taken from publicly-available media kits or websites.

FIGURE 8. GEOGRAPHICAL SPREAD OF MEDIA ORGANIZATIONS THAT PARTICIPATED IN THIS STUDY

Figure 8 shows both the diversity of media outlets included in the data collection (see legend), and the geographic coverage of each outlet. The total audience reach (expressed as the number of unique visitors/viewers/readers) is indicated in the figures, from across all of its platforms. For instance, a broadcast outlet may have a radio news program, but also a website that publishes news reports: the figure displayed represents the sum of both. For an outlet to be deemed to have an online offering, the news needed to a version or replicate of a news story that appears either on the news media website or hard copy newspaper, television or radio bulletin. The story was excluded if only on a social media platform used to promote content. It should be stressed that measuring audiences across different mediums does not neatly align (for instance, while these figures were calculated for a monthly period, the audience reach data sourced was often collected at different dates). Therefore, the figures provided are indicative to give an impression of the presence and diversity of the media outlets in the region.

Using the figures on the map, the total reach of each media type is combined in **Table 3**. This gives an indication of the potential audience impact of the media stakeholders interviewed, by media type. In our sample, radio had the highest combined audience reach of all the mediums, followed by online news platforms (noting that these were often coupled with a traditional medium), print and television.

TABLE 3. TOTAL REACH OF INTERVIEWEES BY MEDIA TYPE

ype of Media	Reach
Print	585,540
TV	160,983
Radio	1,148,532
Online	972,458

Farmer, Grazier and Land manager interviews

One-on-one interview data was gathered following best practice approach of talking directly with farmers (Butler et al, 2013) to preserve context and to protect commercial interests. Farmer interviews occurred between February and April 2021. Each interview ranged between 40 and 90 minutes in duration. Recruitment was via email requests through natural resource management (NRM) groups and through snowball sampling techniques across the GBR catchment area to provide opportunity to farmers that may not be in regular contact with their local NRM's.

The study design was successful in obtaining a cross section of farmer representation comprising many (but not all) agricultural industry sectors in the GBR catchment including grazing, cropping, horticulture, sugar cane, goats, aquaculture and wool production. The design was also successful in providing participation opportunities across the GBR catchments with representation from farmers in the Cape York, Wet Tropics, Burdekin, Mackay Whitsunday and Fitzroy regions (see **Figure 8**). Please *note: The Burnett-Mary was not included in this study.*

This section presents the results from 24 farmer interviews. Six (6) NRMs adjacent to the Reef provided the list of farmers to participate in the interviews. Representatives from all major farming industry sectors in the GBR catchment, sugar cane, beef and/or dairy, cropping, wool production and horticulture were included in the study. The interview process received high engagement from all GBR NRM segments – see **Table 4**. Response bias (SAGE, 2012) was managed by asking alternative researchers to interview participants who were known socially to farmers. A total of 24 farmers were interviewed for this study. All farmer interview data was de-identified for use in the study as a requirement of the ethics application.

TABLE 4. PARTICIPANTS IN FARMER INTERVIEWS (SOURCED FROM NRM AND NON-NRM GROUPS).

GBR Catchment Area	Interviews Completed	Industry (no dairy farmers were able to participate)
Cape York	2	Bananas, sugar cane
Wet Tropics	4	Bananas, sugar cane, tropical fruit
Dry Tropics	11	Sugar cane, grazing, aquaculture, goats, wool, cropping, squash
Mackay Whitsunday	1	Sugar cane
Fitzroy	6	Grazing, avocado, mango, lychee, cropping, grains
Burnett Mary	0	n/a
Total	24	

The map, **Figure 9**, identifies the regions adjacent to the Great Barrier Reef from where participants (traditional media, farming and industry) were recruited. The image identifies NRM groups in Cape York, Northern Gulf, Wet Tropics, Dry Tropics, Reef Catchments, and the Fitzroy Basin; all of which have been identified as significant regions for changes in exposure to sediment and nutrient run-off (Great Barrier Reef Marine Park Authority, 2014). The Burnett Mary Regional Group was not included in this project, due an unfortunate communication break-down between a team member and the NRM.

RP227 Geographical distribution and type of farming and land manager study participants

FIGURE 9. GEOGRAPHICAL DISTRIBUTION AND TYPE OF FARMING AND LAND MANAGER STUDY PARTICIPANTS.

Media Communications labs with Reef communication specialists

Media communications labs are an extended focus group redesigned specifically for media and communications research and promoting co-creation of solutions to problems (Lunt & Livingstone, 1996). Four (4) labs were conducted within the participatory process of the methodology, initially in person, then online to ensure 'COVID-19 safe' practices. The four media communications labs had a total of 25 participants, comprising about four (4) to six (6) people in each group. The lab participants were from a range of communication based roles at different levels within their organisations and included, media managers, public relations and marketing professionals, social media editors and general organisational communicators across the following groupings:

- Industry groups,
- NRMs,
- Tourism representatives, and
- Conservation/environmental non-government organisations.

Participants were from a cross-section of industries including representatives from,
- Ports,
- Agriculture,
- Banana growers,
- Cane growers,
- Sugar industry,
- Tourism peak bodies and private tourism companies,
- Reef conservation groups, and
- Environmental advocacy and on-ground community groups.

Industry representatives were identified through the project teams' familiarity with the Reef space in combination with online searches using known and similar search words. For example, sugar cane growers, sugar research, marine parks, ports, beef, fertiliser; that identified similar organisations operating within the GBR context. The process was repeated until the point at which no new information was observed (Guest et al., 2006).

The media labs were conducted in a hybrid format with some participants in person and others online. The sessions were structured to include a wider group discussion, small breakout group discussions and a live survey component to instantly visualise de-identified responses and prompt discussion on responses using the Mentimeter software platform.

All media communications labs were held between March and May of 2021 with project team members hosting from a range of locations including Cairns, Brisbane and Townsville using a combination of in-person and video-conference for participants. The combination of media communications lab delivery types was necessitated by 'COVID-19 safe' best practice during the collection period.

Ground-truth exercises with steering committee and participants

Using the on-ground knowledge generated from a range of stakeholders – including industry groups, NRMs, tourism representatives, and conservation/environmental non-government organisations – further expert knowledge was elicited from government project stakeholders. This included meetings with project steering group committee members. Steering group members included water quality experts and scientists, federal and state human dimension and social science experts, and communication experts. In addition, several seminar presentations as work in progress were delivered to appropriate professionals at the Department of Environment and Science, Department of Agriculture and Fisheries and the Reef 2050 Communications Network.

Summary

The final stage of the project was to test the findings through expert elicitation with members of the Reef protection agencies' media teams and the project steering committee. Consultations took place with DES, DAF, Department of Resources (Resources)1, Australian Institute of Marine Science (AIMS), and GBRMPA to test the findings, responses and recommendations. The findings were broadly supported by the experts, who identified correlations with their own experience and knowledge and opened areas of further research (see the final section of this report).

1An invitation to participate was extended to the Department of Resources, unfortunately they were unable to attend.

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Part One: Reef Water Quality Media Narratives, Characteristics of Key Literature and Stakeholders

Introduction

There is limited knowledge about how natural resource management groups, Reef protection agencies, reef investment groups, industry, land managers, tourism operators, journalists and editors, and environmental groups involved in Great Barrier Reef (Reef) water quality communications shape mainstream media narratives.

This project has explored the many narratives that form a landscape in which the media system, sits within a wider system that includes government, and industry sectors. By appreciating this broader context for the media system, we can better understand how to navigate complex narratives.

To reiterate, in this project, the term 'media' refers to print, broadcast, community outlets and social media, from both industry (journalists, editors, and news outlets), professional individuals and groups that form part of the media narrative through user-generated content via social media.

The relevant agencies are working towards achieving the Reef Water Quality Improvement Plan (RWQIP) objectives. Whilst concerted efforts are being made to meet the objectives are being met, several other factors are impeding the desired results. This part of the report shows how Reef Water Quality (RWQ) media narratives exist within a system that is influenced by many information sources. Below we set out the main characteristics found in the desktop review. These characteristics also form the basis of the problem, in that they are influential in how media narratives are formed, making it difficult to cut through the noise in a call for actions, such as the RWQIP objectives.

Characteristics of academic and grey literature

From the first search of literature – which included 136 papers after removing duplicates, books and book chapters within the academic literature. An early finding was that academic and grey literature around Reef water quality and media narratives was limited.

Of the small number of related papers, the most prominent themes were **place, identity**, and **conservation**. There was only one paper directly connecting water quality with media narratives. The major sources of information were from government, scientific and marine institutions. This is significant as it shows that much of the government work is limited to academic institutions and organisations, and not the wider public arena. A final 10 articles were identified and reviewed.

Characteristics of traditional news media stories

While there are major narrative sources from government, scientific and marine institutions (for example, policy, regulation, funding); RWQ narratives are also influenced by events outside of these sources. Events include natural weather events (for example, tropical cyclones and floods), poor water quality reporting, coral bleaching, and the broader issue of climate change, including mitigation and potential Reef restoration narratives. There are also narratives from international sources based on wider water quality issues, and we highlight these as future research opportunities at the **Future** areas of research.
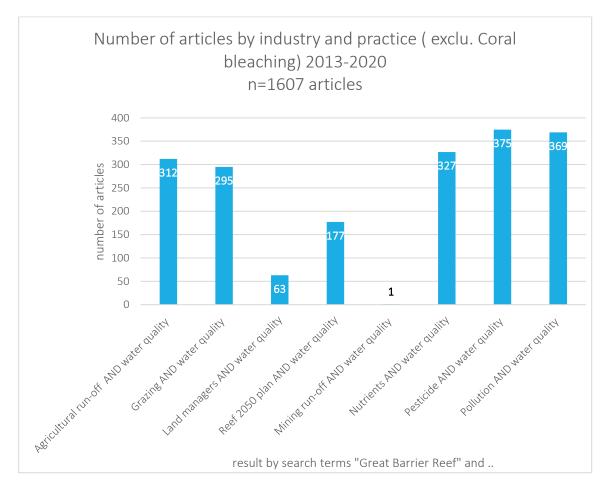
A search of newspaper reports using ProQuest shows coral bleaching was by far the main narrative. The main RWQ narratives are around agriculture and grazing, with regulation were also prominent (**Figure 10)**. Mining was nominal, as was pollution. Pollution often was referring to plastic pollution and nitrogen run-off.

FIGURE 9. AUSTRALIAN NEWSPAPER ARTICLES CONTAINING "GREAT BARRIER REEF" AND SELECT SEARCH TERMS

The spikes in 2016 and 2017 shown in **Figure 10** reflects both the coral bleaching episodes and the introduction of state legislation to address RWQ through the Reef protection regulations. In the first data collection process, coral bleaching was a prominent narrative. When you remove coral bleaching (456 articles) as it is linked to climate change and not Reef water quality, there remains the following themes.

Number of articles by industry and practice (exclu. Coral bleaching) 2013-2020
n=1607 articles

FIGURE 10. NUMBER OF ARTICLES RELATING TO GBR WATER QUALITY BETWEEN 2013 AND 2020

The traditional media analysis shows that agriculture and grazing with the strongest connections themes in stories including water quality topics. The Reef 2050 Plan was linked to water quality in connection with UNESCO World Heritage commitments by the Queensland and Federal governments. Despite other media-related stories about the Reef linking to mining, in the RWQ news reports, connections between RWQ and mining was nominal, with just one articles making a direct link between RWQ and mining.

Characteristics of social media narratives

The social media participants in the water quality narratives included a range of people, organisations and media accounts with no dominant narrator or group of narrators. The use of social media on the Reef generally and/or in relation to including RWQ issues specifically is an emerging field of research. Existing studies predominately relate to data collection and citizen science based concerned with biophysical research, or smaller scale social media platform use by specific end-user groups in human dimension studies. We did not find any literature specifically on the use of social media for social good in the RWQ context.

For organisations in the RWQ space, research into social media platform use provides opportunities for key organisations to access communities of interest and extend the legacy domains of previous studies to build social resilience to water quality changes (Gooch, Butler, Cullen-Unsworth, Rigano, & Manning, 2012). There is also the ability for organisations to use social media networks to monitor public support for policy changes, particularly in environmental policies with scientific dissent (Aklin & Urpelainen, 2014).

Facebook was the most common social media platform from journalists, farmers and the media communication lab participants. YouTube was identified by younger famers as an education tool and by journalists seeking stories or sharing information. LinkedIn was listed as a preference by the media communication lab participants.
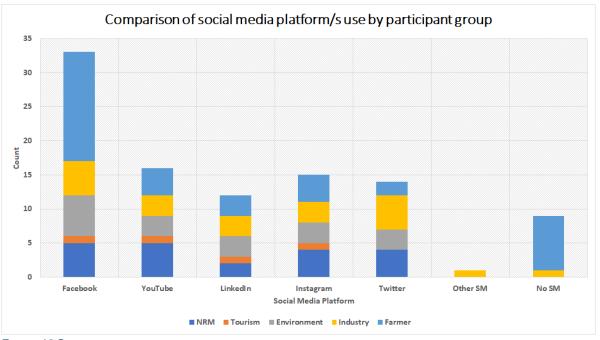
FIGURE 12 SOCIAL MEDIA PLATFORM USE BY END-USER PARTICIPANTS

The data suggests there is a difference between the choices of platform for communications with different end-user groups (see **Figure 12)**. A greater cohesion in the RWQ narrative may be obtained through further tailoring of the strategic alignment with end-user platform use to improve reach and enable engagement of target audiences. Our results show RWQ end-users are active across several social media platforms, the types of content and stories, that they would prefer to engage with, and the positive sentiment they are seeking across a range of geographic locations in the Reef catchment.

Summary of social media narratives

The findings on platform preferences for current narrative end-user groups are:

- Twitter was the least used platform by farmers, and the most heavily used by journalists.
- Facebook users were most likely to be on multiple social media platforms, with YouTube or Instagram the most likely combinations.
- Younger farmers used YouTube for education purposes, specifically for information on innovative farming practices internationally that were not available through local sources.
- Facebook is the main social media platform used by farmers to discuss and respond to water quality with NRM and journalists, but not with the government.
- Facebook is the main communication channel used by journalists to source stories and gauge how farmers react to those stories.
- Facebook is predominantly used by journalists to facilitate feedback from the general public on the interest in media stories around water quality and Reef stories.

Media releases from the Queensland government using water quality key terms on Twitter during the project review sample periods were of low density, within highly centralised networks that concentrated the power of the narrative within a small number of participants. Government departments tended to retweet each other's posts, showing potential for the enhancing of a stronger unified voice on key issues requiring consistency. However, these tweets tended to fail to reach the wider audience, or a more diverse audience. The DES specific data suggests alternative communication strategies resulting in a conversational archetype that indicates more two-way interaction (Smith et al., 2014) and made on a variety of targeted user group platforms could be considered to support stakeholders and meet the relationship-building and trust-building requirements identified in this project.
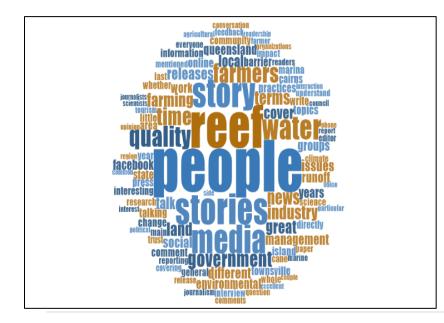
Characteristics of RWQ media practice by media practitioners

Journalists focused more on human interest angles than water quality and scientific narratives, except for the ABC, which has a policy to use scientific data to support their news stories, including a human-interest angle with a scientist who could explain the data and simplify the information.

Audience-friendly words are also found in the earlier desktop study that showed journalists' use of 'tangible language' helped to convey RWQ media narratives. In addition, human interest framing is found in most journalism interviews and often with a local angle or hook. **Figure 13** provides a word cloud of the most common terms by journalist used in the interview data. The terms refer to how they see Reef water quality narratives.

"Probably a lot of like the case studies and stuff that includes - dry-tropics do – put forward because it's showing, you know, they make these little videos and make these case studies and social media posts to show what farmers are doing to mitigate runoff and stop gullying and erosion and all of that - so that's what interests me the most is how can I – can I do that on my own farm" (farmer).

Journalists' source quotes from industry and environmental groups – particularly conservation groups and relevant industry groups – for comments to respond to state government media releases. For example, in central Queensland where cattle farming is more dominant, journalists will go direct to AgForce or similar for direct quotes. Equally, north and far north journalists in sugar cane communities will speak with the sugar cane industry for comment. Their rationale was that these industry bodies were accessible, knowledgeable and geographically relevant.

However, unlike the farmer data that has the Reef adjacent to narratives, the Reef is central to their framing of Reef water quality narratives for journalists. See Appendix C: Interviews with farmers and media representatives for more details.

FIGURE 11. WORD CLOUD OF KEY THEMES FROM ALL JOURNALIST INTERVIEWS.

Summary of most common themes from the interviews with journalists (including editors and chief of staff)

The key findings from the 14 journalist interviews were:
- Journalists felt that the relationship between their media outlet and the Department was one-way, with the department only responding to interviews requests with Ministers on good news stories.
- That there is a lag-effect in the response time between media requests for Ministerial comment from the Department, and industry practice (news cycles can be less than 2 hours).
- Media practitioners tend to use more '**human interest**' language when reporting on land management and farming stories.
- The most common terms journalists use **'Reef', 'Story',** and **'People',** '**farmers'** is interchangeable with '**land managers**' and **'agriculture'**, along with **'run-off'** in preference to water quality.
- A sense that Reef protection agencies weren't aware of local and hyperlocal issues, outside of Townsville and Brisbane. This sense of dissociation generated a sense of disconnect between regional and metropolitan audiences.
- Journalists use Facebook as a communication channel to source stories and gauge how farmers react to and facilitate feedback on media stories around water quality and Reef stories more broadly.

A full explanation of how Leximancer diagrams work is contained in the Appendix D: Leximancer methodology.

Characteristics of media practices from farmer interviews

Farmers described the role of the media as providing a means to discuss, rather than as agenda-setting participants in the RWQ narrative. **Figure 13** shows that the themes of land, soil and people are more prominent in their thoughts than the media.

There was a notion of more co-design and collegiality conveyed in the data where farmers signal industry bodies are their most trusted source of information, along with a need to see their resulting good work stories disseminated widely to the public.

The data showed many farmers think about the RWQ narrative as being discrete from their immediate business operations. There was also a sense they were being targeted in the media Farmers identified the urban and industrial voices as missing from the RWQ narrative.
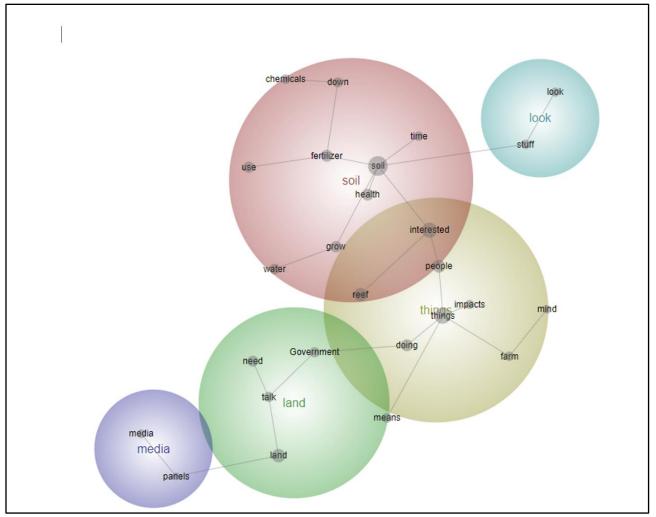
FIGURE 12. LEXIMANCER ANALYSIS FROM THE FARMER INTERVIEW TRANSCRIPTS.

Leximancer is a heat mapping visualisation.
Red (soil in Figure 13) is most important through to cooler colours (look and media) as least important. The size of the bubble represents the size of the concept present in the textual data.

The distance between farming practice and the Reef is visualised in the data by the Leximancer diagram identifying both concepts and placing those concepts at opposite ends of the colour spectrum and special map. It is also demonstrated through the lack of connectivity shown through relationship lines between the themes contained in each concept. The separation of business operations is also evidence in farmers responding to our question on how to 'open up' water quality conversations in the narrative. It is also drawn from the question on what alternative media narratives farmers would like to see – they all responded with stories about their actual business operations and those of others, innovation, good news and wider reach into the community of those things.

Characteristics of Media Communications Labs

Media Communication Lab

What's your organisation's key communication messages when it comes to WQ?

Improving farming managing practices can benefit productivity while improving water quality to local waterways and the Great Barrier Reef. Good water quality supports fish habitat for species such as barra and mangrove jack. Keep soil on land.

Improving water quality helps the Reef be resilient to and recover from climate impacts - it buys the Reef time.

WQ is important, People's (community) participation is crucial, Information needs to be clear and concise and relevant, resourcing of community groups is fundamental

Messages are of the positive health of our waterways, and how we contribute to ensuring it remains that way.

In the section, *Media Communications labs with Reef communication specialists* above, we explain that a Media communications labs are an extension of the social science method of focus groups. Focus groups are the collating of small (between 4 and 6 people) of similar expertise which information is elicited. The labs are specifically for media and communications research, and part of the co-design process.

From the four labs held we established the following themes:
- Conflict drives a lot of the RWQ narratives, and many participants felt the politicisation of RWQ narratives was preventing clear messaging,
- Conflict was identified when there is politicising of the water quality issue and perceived negativity
- Many media communication lab participants flagged that they were intentionally **disassociating** themselves from the narrative and Reef protection government agencies,
- Communications professionals were producing webinars, newsletters, blogs and podcasts as a way of offering an alternative message. Further work is needed, but data from the media communications labs suggest that the industry and peak bodies may influence narratives.

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Reef Water Quality Media Narratives: Actors

What are the main media (traditional and social) narratives?

In this study, media narratives can be distinguished as: 1) narratives about RWQ – central RWQ narrative and 2) narratives about RWQ narratives, or 'meta-narratives'. The first type of narrative includes the (traditional or social) media content or stories about RWQ, which may relate to its state (for example, good or poor), possible causes for change in its state, and actions being proposed or taken to address RWQ. The second type of narrative relates to the media characterisations of the narratives themselves, that is, they reflect an awareness of what is being said about RWQ in the media, how RWQ stories are told, and by whom. These meta-narratives are embedded in and reflect media processes and practices that influence *how* and *why* media stories are produced, positioned, and circulated.

The central media narrative identified under this project is:

Reef water quality and status of reef health is uncertain

The main meta-narratives include:

- Importance of the science is eclipsed by the political agendas,

- RWQ stories are framed around conflict to generate revenue[2],

- Media coverage of run-off/water quality (if reported at all) focuses on plastic pollution and gully erosion, rather than for other RWQ issues e.g. land management, enhanced stewardship,

- Negative media stories (actors perceived as adverse in RWQ responsibility and outcomes) is impeding funding, engagement and association thereby aiding misinformation, and

- RWQ regulation and legislation is often challenged by misinformation, and/or political power plays.

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2 This business model contains narratives that are conflictual, but remain within the bounds of professional journalism, as opposed to clickbait (content of dubious value or interest). For example, there are reports of driving offenses or crime.

Who are the main stakeholders and narrative generators?

I think the Water Quality Improvement Plan may not always get exactly the results that it's looking for, but as a framework and aspirational targets and the science behind that's really strong and I know there's a review coming up, so I hope it doesn't change too much and we keep working towards that. And I'd like to put a plug in for the Reef 2050 Plan. It's a long, it is a long term plan that's why it's called 2050, but I think it's done a great job of focusing on… government attention, government resourcing and also industry, which is more joint process which can always be improved (Industry MCL participant)

The data suggest that RWQIP message is cutting through to some stakeholders, but often competing with other stakeholders for a voice. There's a suggestion in the media communication lab with Industry that the data is well researched and framed, but the immediacy of the media business model, and the 'lag-effect' in the longer term objectives in the **RWQIP and Reef 2050 objectives are not being conveyed by the media as an urgent issue.**

In the current media system, we categorised these participants are leading RWQ narratives into four (4) groups:
(1) Local-level environmental and national conservation groups (terrestrial and marine),
(2) Industry and peak bodies (sugar, bananas, agriculture, ports, tourism, beef and energy resources),
(3) Farmers and land managers, and
(4) Journalists/editors and newsroom chiefs of staff.

Reef protection agencies messaging was not cutting through to the land managers, and journalists were not found to be generating the most common narratives and were often missing from the main narratives. Of the 1,607 articles in the final sample, the presence of Queensland Reef protection agencies was nominal, and we suggest is partiality due to the findings with the journalists that it's difficult to get a rapid response to Ministerial comments and interviews requests. The NRM groups identified a slow approvals process as one reason there is limited representation. Journalists felt that media releases often lacked resonance with local communities and so other sources, such as farmers, or industry would be preferred for a direct quote rather than government voices.

I think that actual news stories, that very much the NRM groups and groups like CaneGrowers and others that have had quite a success in promoting, and the activities on ground, and what's changing, and who's doing this with SmartCane BMP… the negativity comes from government reports, government targets, government messaging and we're spending so much money. I think that's where that's been the negativity comes from (industry MCL participant).

Who is participating in the narratives?

The main sectors producing narratives are journalists, industry (ports, cane, and agriculture). The main sources are industry and environmental groups. These include ports, NRMs, conservation and local grassroots-based environmental groups.

In regard to the sectors generating the most common narratives, we found that each group generated agenda-setting narratives and did not seem to work together to produce a coherent narrative. This result indicates the narrative is very disjointed.

Whilst Reef protection agencies were discussed, there was no strong sense in the data that they were prominent in the narrative. Instead, narratives were often generated in isolation from each other.

Who is missing from the narratives?

This project identified two major gaps related to the RWQ narratives and meta-narratives. Firstly, there is no '**consistent voice'** throughout the narrative. While differences in views are expected and welcomed, in a diverse media landscape without a consistent voice on RWQ issues, audiences are not confident who to trust, which is particularly important in times of uncertainty, crisis and disruptive change. We know from general behavioural literature that trust can be built over time through a lead stakeholder generating narratives that demonstrate a responsiveness to public views, alignment between messages and action, consistency and repetition of messaging, transparency and active collaboration. This observation is important, as this study found that trust was the underpinning barrier to narrative participation for all participants.

No consistent voice: While differences in views are expected, and welcomed, on a diverse media landscape, without a consistent voice on RWQ issues, audiences are not confident in who to trust, which is particularly important in times of uncertainty, crisis and disruptive change. We know from general behavioural literature that trust can be built over time through a lead stakeholder generating narratives that demonstrate a responsiveness to public views, alignment between messages and action, consistency and repetition of messaging, transparency and active collaboration. This observation is important, as this study found that trust was the underpinning barrier to narrative participation for all participants.

> *because they [tourists] hear the reef is dead, whether it's from bleaching water quality or pesticides, …. And where can I go that's going to not be dead... I was talking to one of my members, which is a member or tourism in the Sundays, said water quality is a big issue for him because for all our practice it's actually one of our most. Probably one of our most common question what's the visibility. (Industry MCL participant)*

What is missing from the narratives?

Narrative void: is a **'narrative void'** resulting from the Reef protection programs' communication processes needing to meet the needs of a dynamic and politically-charged communication environment. The research has identified some opportunities to strengthen communications for actors in achieving the RWQIP objectives. We consider these findings in relation to the RWQIP objectives and address ways to strengthen in Parts Two and Three

Narrative void: In the media systems, we identified three ways the narrative voids occurred.

    1.   The key actor's voices are missing Reef protection agencies and their perspectives, actions and programs are often missing from the media narratives due to slow response times to media requests. Slow responses can be due to unnecessary approval levels, a lag behind media and industry standards. When the response is delayed in a media landscape that changes hourly, a narrative silence results. The silence is quickly filled by other voices, which then shape the dominant narratives. Some sectors of government, feel hampered by the same constraints and seek alternative platforms (for example, podcasts and blogs). Traditional and social media frames RWQ as a conflictual issue- to generate interest or push individuals' political and social agendas.

> *I guess we [Ag industry] try and raise the public acknowledgement of their contributions into and not being made the… scapegoat for the negative impacts on the Reef, …from a communications point of view that's what we're trying to do to: just promote the good work that the agricultural industry is doing in the Reef and contributing to the Reef 2050 Plan. (Industry MCL participant)*

When political biases is embedded in the reporting of RWQ stories. Studies (Bacon, Manne and others) show that editorial often align along party lines, such as News Corp Ltd. media's support for Liberal politics.

The quote (left) shows how not only Reef protection agencies, but Industry are finding they are part of a narrative void, dominated by drama and conflict narratives. Reef protection agencies and their perspectives, actions and programs are often missing from the media narratives due to slow response times to media requests, often due to gatekeeping or bureaucratic processes that are slow compared to media and industry standards.

> *The whole conversation around water quality, with the new legislation that's come in, the media is trying to make it a soap opera, you know because it then sells paper that says ratings…And it's not helpful for both farmers or doing the right thing forestry industry traditional industry is doing the right thing and the reef operators (Industry MCL participant)*

When the response is delayed in a media landscape that changes hourly, a narrative silence results. The silence is quickly filled by other voices, which then shape the dominant narratives. Some sectors of government, feel hampered by the same constraints and seek alternative platforms (for example, podcasts and blogs). **Figure 14** below is a simplified version of the narrative void process.
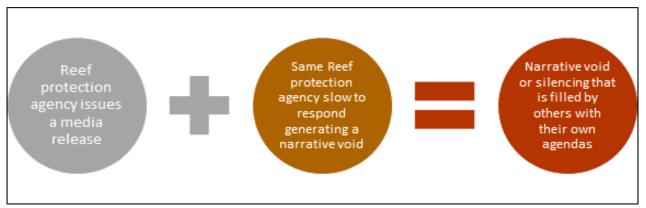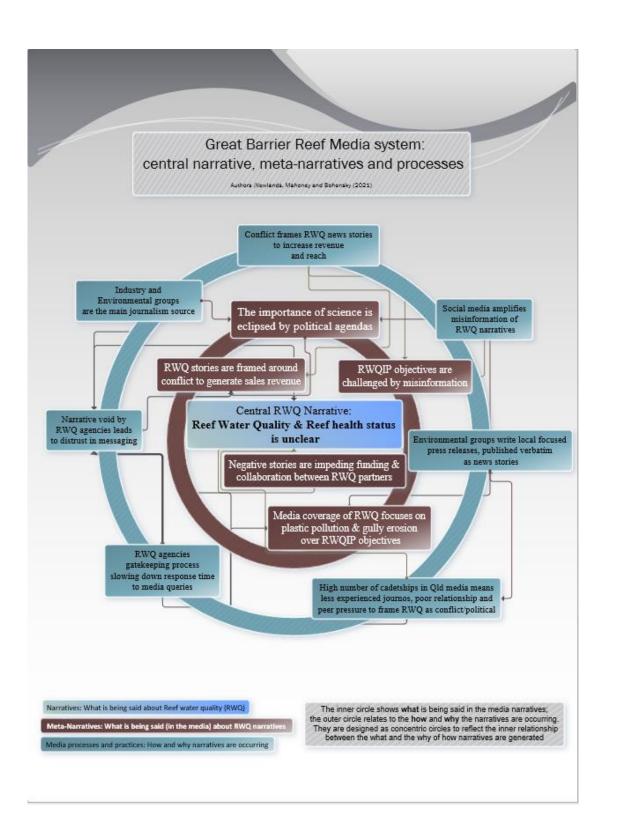
Reef Water Quality media narrative framework

Based on the characteristics, central media narrative and meta-narratives, an innovative framework has been developed from this project, demonstrating how and why the RWQ media system defines the narratives. At the core of this system **(light blue box)** is a central RWQ narrative, encircled by and connected to various meta-narratives **(maroon circle/boxes)** that were identified in this project. These in turn are encircled by and connected to a range of media processes and practices **(tealcircle/boxes)** that influence narrative dynamics. **Figure 15** illustrates the conceptualisation of the RWQ media system which comprises these narratives, processes and practices and the relationships between them.

Summary section

The framework enables end-users and environmental managers and communicators to better understand the system within a wider system that includes government, media and industry sectors. The central narrative is a deep concern over the status of the Reef's health for all participants in the project data. The media communication lab data also revealed here is not a single RWQ media narrative, but several meta-narratives all competing to be the main voice of RWQ media narratives.

Great Barrier Reef Media system:
central narrative, meta-narratives and processes

Authors :Newlands, Mahoney and Bohensky (2021)

FIGURE 14. THE REEF WATER QUALITY MEDIA SYSTEM FRAMEWORK

Part Two: Reef Water Quality Media Narratives: Evidence Based Responses and Recommendations

In Part Two we set out a series of responses to the findings by way of offering solutions to improving behavioural changes through media narratives.

In this part, we apply the framework data identified in part one, as a baseline for a program logic approach that will seek solutions, measures and means to develop a potential process that will aid in countering the lack of consistent voice, narratives void sets out the resources and activities that comprise the program and the changes. In this section, we use the data findings and information generated through the participatory process to identify a set of five suggested responses (see **Figure 16**) for actions towards advancing RWQ narratives.

TABLE 5. SUMMARY OF RECOMMENDATIONS

1.1	**Reef water quality agencies and investors manage trust of government messaging to reduce misinformation (information not intended to cause harm) and an existing narrative void.**
1.2	Reef water quality agencies and investors collaborate with industry, environmental groups and science communicators to escalate awareness of RWQIP and Reef 2050 objectives.
1.3	Reef water quality agencies and investors represent a diverse range of representation (gender, indigeneity, ethnicity, age, etc.) to generate a sense of community ownership is in achieving RWQIP and Reef 2050 objectives.
1.4	Reef water quality agencies and investors amplify existing efforts of sharing success stories that centre on social, environmental and economic success to promote RWQIP objectives and prioritise economic gains for land managers.
1.5	Reef water quality agencies and investors decentralising increased awareness of messaging to a local level to include areas outside of service area issues beyond metropolitan (Brisbane) and regional centres (Townsville).

In combining these responses with the RWQ media framework, we can:
   a) establish the media narratives, motivations and framework, and
   b) provide measures and responses to react to the RWQ media narrative framework.
Below we set out each individual response, the rationale, action and expected impact in navigating the RWQ media system.

**Great Barrier Reef Media system:
central narrative, meta-narratives and processes**

Authors ;Newlands, Mahoney and Bohensky (2021)

Conflict frames RWQ news stories
to increase revenue
and reach

Industry and
Environmental groups
are the main journalism source

The importance of science is
eclipsed by political agendas

Social media amplifies
misinformation of
RWQ narratives

RWQ stories are framed around
conflict to generate sales revenue

RWQIP objectives are
challenged by misinformation

Central RWQ Narrative:
**Reef Water Quality & Reef health status
is unclear**

Narrative void by
RWQ agencies leads
to distrust in messaging

Environmental groups write local focused
press releases, published verbatim
as news stories

Negative stories are impeding funding &
collaboration between RWQ partners

Media coverage of RWQ focuses on
plastic pollution & gully erosion
over RWQIP objectives

RWQ agencies
gatekeeping process
slowing down response time
to media queries

High number of cadetships in Qld media means
less experienced journos, poor relationship and
peer pressure to frame RWQ as conflict/political

Narratives: What is being said about Reef water quality (RWQ)

Meta-Narratives: What is being said (in the media) about RWQ narratives

Media processes and practices: How and why narratives are occurring

The inner circle shows **what** is being said in the media narratives;
the outer circle relates to the **how** and **why** the narratives are occurring.
They are designed as concentric circles to reflect the inner relationship
between the what and the why of how narratives are generated

FIGURE 15. SCHEMATIC DIAGRAM OF THE MEDIA NARRATIVES, PROCESS AND PRACTICES PROGRAM LOGIC AND FRAMEWORK

Response 1.1: Reef water quality agencies and investors manage trust of government messaging to reduce misinformation (information not intended to cause harm) and an existing narrative void.

"…in these kinds of packs [news packages], because then people are saying that no comments are coming from the government about, you know,...what they're responsible for, they're in charge of." (Central QLD news editor)

Evidence

In the media communication labs, participants talked of a lack of response from Queensland Reef protection agencies in terms of it slowing their ability to respond to media releases or issue their own content releases. There was a general sentiment the Queensland Reef protection agencies were needing to keep up with the rapid and dynamic media landscape in the Reef catchment area. Journalists also spoke of delayed responses with requests for comments on RWQ issues and media releases.

Some of the participants felt this added to sense of distrust over messaging, which resulted in an intentional disassociation by industry and peak bodies from government media releases. A sentiment was expressed that the RWQ narrative had become too political and confusing because of misinformation generated in the narrative silence.

Farmers and environmental groups display caution about engaging with media releases and government statements with the media for fear of misinterpretation and peer or public backlash, plus also concerns about the withdrawal of government funding or access to future funding opportunities.

Participants mentioned that, because of amplification and misinformation, some were intentionally removing their organisations from the Reef narrative; or they were seeking alternative ways of communicating (for example, blogs, vlogs, podcasts, membership videos, newsletters) to communicate business practices in an environment where they had more control of the messaging.

Further research is required to identify if there are many different groups or individuals who are choosing to amplify the narratives across closed social and community media, and traditional media narratives where governments may not be present.

Expected impact from managing misinformation and trust:

Misinformation embeds myths in the RWQ narrative, and silence as a response serves to amplify the misinformation (Hall, 1979; Wardle and Derakhshan, 2017; Cook 2019). By increasing the government, respected science, community leader, celebrity, local trusted voice, or a combination of

them all can be prevented from becoming widespread.

Analysis: Why manage trust?

Social capital (trust) in the drivers and agendas of information sources

"A more trusted source would be someone that [sic] lives locally in the community that people know, that people have met, and that could be a local MP, but depending on your voting bias… it comes back to finding someone that people can identify with that they know from the community that doesn't have a political agenda" (north Queensland journalist)

Trust in the Australian Government and the media has increased over the 2020 and first half of 2021 according to the 2021 Edelman Trust Barometer3. The barometer reveals that trust across all Australian institutions has reached an all-time high.

However, trust in media sources has decreased over the 12 months of 2020-2021 (The Economist, 2021). In addition, traditional media and search engines saw a decline in overall media trust between 2020 and 2021. Still, there's been an increase of trust in owned media (up 5 points) and social media (up 9 points).

Our data suggests a decline in trust between Reef protection agencies and the land managers and farmers, but an increase between the farmers and NRMs. The narrative void from missing Reef protection agency voices is perceived, and possibly framed by journalists, as agencies are not listening to producers.

Lack of trust in institutions is certainly not unique to the Queensland Government. The politicisation of the Reef, over many decades (Rohan et al., 2016), means building social capital to build trust in institutions should be viewed as a matter of risk mitigation and not a spiral of silence (Cook et al., 2017), which – until recently – has been commonplace in RWQ communication. Our consultations with

"the biggest challenge is, primary producers, feel their views are not heard by the state government. And that was very clear throughout most of the big legislative changes that have probably happened over the past five years" (north Queensland farmer)

the Queensland government communication experts found that feedback loops do exist via consultation processes and on-ground town hall style meetings, the industry expressed that the slow response to feedback and media commentary can be a hindrance in building trust.

Misinformation, disinformation and social capital

Social media has certainly been shown to rapidly circulate negative sentiment (Nemes & Kiss, 2021). Yet, governments can address misinformation and disinformation through a series of steps (Wardle and Derakhshan, 2017) that we apply to this study in conjunction with Lewandowsky et al. (2020) and Cook et al. (2018)'s work on deconstruction and debunking questionable media narratives.

A predominant narrative is often formed when there is a 'switching point' (Arsenault & Castells, 2008; Castells, 2009). A 'switching point' is when an individual or organisation – known as 'switchers' – exercises power to attempt to switch the narrative from its current 'program'. Addressing actions to individual circumstances through switching points provides great techniques to deal with misinformation and disinformation specific events.

However, to develop leadership, trust from end-users, and facilitate project co-design requires a mindset and approach that can also harness social media's power for good. When a switching point occurs (for example, during a natural disaster or introduction of new Reef regulations), if the supplier of information withholds that information or delays responses for more information, there is a risk of generating a narrative void. Once a void appears, it becomes difficult to control the main narrative and messaging.
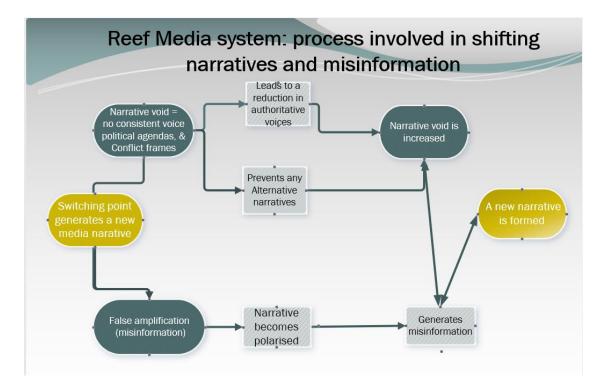
FIGURE 16. DEVELOPMENT OF A RWQ MEDIA SYSTEM THAT REDUCES FALSE AMPLIFICATION

Figure 17 focuses on the extremes of a spectrum but can be adapted to more day-to-day process. The key point is that if an organisation is aware of a future switching point- such as new regulations, soft role out of new policy etc. they can control the message in advance

There is also an emergence of 'false amplifiers' – the coordinated activity by inauthentic accounts that have the intent of manipulating political discussion (Wardle and Derakhshan, 2017). Equally, there are 'non-false' amplifiers – i.e., authentic accounts and influencers having an impact (Ognyanova, 2017). False and non-false acting as third party 'switchers', outside of the Reef protection agencies' communication channels will fill the void with public responses, and this can create a false amplification. This amplification can then lead to polarisation through the repetition of misinformation and disinformation.

If the amplification is successful (for example a new narrative based on misinformation and exaggeration), it generates a new narrative until another switching point occurs. Only when you either control the switching point or redirect any amplification with either more voices or a unified voice across the many Reef protection agencies, can the narrative remain with the leading RWQ media voices.

> False amplifiers and spirals of silence have muddied the RWQ narratives and discouraged specific parties from participating in those narratives.

Hence, understanding who the switchers are and how they generate new narratives requires a deep dive into the data to identify how previous switching points have been controlled.

Our consultation process found that a national Reef protection agency will pre-empt an amplification, by releasing information slowly, with early data and interviews with the lead scientists. Then when the event or switching point occurs, the journalist are already aware of the story, and given access to the lead scientist along with supplementary material, images, video explainers, figures etc. The impact of preparing for the switching event gives the agency control over the messaging and harder for dissenting voices to influence the narratives, as journalist have already been provided with background information.

This strategy can be supported with the practical application of **social media for social good concept.** The concept of 'Social Media for Social Good' is a relatively new phenomenon emerging around 2012 with the development of social media platforms, particularly Facebook and Twitter. There is a resurgence of the social media for social good concept in the academic and grey literature from 2018 with the increased use of social technology due to a series of natural disasters in Australia, and more recently on a global scale with the movement online due to COVID-19 restrictions.

Social media for social good involves digital platforms being strategically accessed by public or private organisations and individuals, leveraging digital networks to promote and engage target audiences in causes benefitting societal needs. The promotion of social good has a benefit in that it builds trust with a community.

It is also noted when water quality is viewed as a social good, there is recognized tension between economic and social value positions in communities (Day, 1996; Makwara, 2011), and this is reflected in traditional and social media communications forming media narratives. We found evidence of this tension is the RWQ narrative and confirmed same in the participant data, particularly concerning land managers perceptions of Government and public sentiment arising from media portrayals.

Summary of recommendations from 1.1

The data suggest developing a strategy to build social capital based on unified messaging, a range of diverse voices and a co-design of messaging between agencies. The ground-truth exercise indicates that the Reef 2050 Communications Network is a potential conduit for this approach.

These gaps include:
- Uncertainty over Reef health is a narrative that has been manipulated for misinformation,
- Political narratives favoured over scientific facts, with the science often seen as too complex to counter the politics,
- Social media can amplify misinformation and reaffirm preconceived ideas about RWQ, and
- Reef protection agencies' gatekeeping processes create a lag effect in responding to media narratives.

We recommend developing strategies that 'debunk' misinformation without generating more conflict. These may include adding novel and new voices to the narrative such as high-profile individuals, celebrities, and science communicators. Research shows there is no difference in the way an audience responds to scientific reports written by scientists-as-science-reporters and stories written by news journalists (David, Garty, & Baram-Tsabari, 2020).

Other strategies include:
- Response times to match industry standards, between Reef agencies and investors, and the science community,
- Debunk and deconstruct misinformation, and
- Increase the consistent voice.

Response 1.2: Reef water quality agencies and investors collaborate with industry, environmental groups and science communicators to escalate awareness of RWQIP and Reef 2050 objectives

Evidence

Journalist interviewees said they tended to source information from NRMs, industry and environmental groups for stories, especially when spokespeople from government agencies were slow to respond. In media and communications lab discussions, industry and environmental groups discussed preparing stories for journalists on issues they wanted to be reported in the news media.

> "I also think that when it comes to government departments, in particular, it's very difficult for us to try and get anything from them" (Central Qld journalist).

FIGURE 17. RESPONSES FROM THE MEDIA AND COMMUNICATIONS LAB PARTICIPANTS WHEN ASKED ABOUT BUILDING TRUST

The word cloud in **Figure 23** combines responses from the media communications lab participants when asked, 'Where can capacity in social capital be built?'

Our data from the media communications labs shows that most participants say trust can be built from greater inclusion of the community and industry, as well as building positive relationships with journalists.

Expected impact

The strategy of a unified media communication strategy increases uptake and wider reach for government messages in the RWQ narrative, plus creates a consistent trust-building narrative.

Summary of recommendation 1.2

As identified above, many of the narratives work within sectors and not across sectors. A missing leading voice on RWQ matters means the narratives and messaging may appear contradictory and confusing for audiences. Further leadership voids also exclude clear feedback loops for end-users to engage in the issues.

Identifying ways of unifying this narrative through joint media releases across relevant government departments and existing networks would assist in providing a unified voice, especially across government departments and other Reef protection agencies and Reef investors.

Response 1.3: Reef water quality agencies and investors represent a diverse range of representation (gender, indigeneity, ethnicity, age, etc.) to generate a sense of community ownership is in achieving RWQIP and Reef 2050 Plan objectives

Evidence
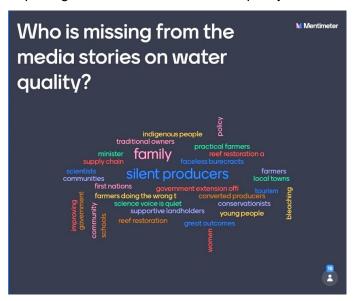
Our data provides evidence to support this response is covered by the following findings:

- Farmers discussed urban voices missing from the narrative as problematic,
- Journalists discussed not having local people visibly included in news stories,
- Indigenous journalists spoke about a lack of Aboriginal and Torres Strait Islander inclusion, and
- Project data identified a lack of cultural inclusion within end-user groups.

"We try and open up the discussion to get people talking about different sides of the argument, ... I think there needs to be more stories around the issues of urbanisation," (north Queensland farmer)

Farmers in particular spoke about a greater inclusion of urban voices. A sense of connecting water quality narratives with urban communities – not just framing it as an issue for farming and land managers – was strongly communicated across the interviews. It was suggested as a means to opening the debate on Reef water quality narratives, but also generating a 'so what' factor for people who lived outside of the rural areas – essentially giving the issue relevancy and currency.

Similarly, greater diversity assists more people to take ownership of and responsibility for RWQ outcomes for the ultimate protection of Reef. Promoting diversity of voices in the Reef media narrative increases representation that reflects the community and a sense of collective responsibility.

FIGURE 18. RESPONSES FROM THE MEDIA AND COMMUNICATIONS LAB PARTICIPANTS WHEN ASKED WHO IS MISSING FROM THE RWQ NARRATIVES

Figure 19 combines responses from the media communication lab participants when asked, who is missing from the media stories on water quality.

The media communication lab participants were asked an open question as to what voices are, in their professional experience, missing from the RWQ narratives. Responses included, Traditional Owners, Indigenous peoples, and First Nations (see figure 19). Other comments of note include silent producers, reef restoration, younger people and science voices. None of these groups of people were found in the data for this study.

The industry BMP programs. I think they provide farmers with that feeling of ownership over the program, which ensures that they're probably a little bit more invested in its implementation and the outcomes of those programs. …They're looking for ways to reduce costs on-farm and also provide outcomes for the environment as well (Industry MCL participant)

Expected impact

- Greater diversity assists more people to take ownership of and responsibility for WQ outcomes for the Reef.
- Promoting diversity of voices in the Reef media narrative increases representation that reflects the community.

Recommendations

- Be aware and have evidence of diversity in content.

- Create a checklist of demographics included in the text and visual imagery for all RWQ content. Track metrics overtime to support coverage of diversity.

Response 1.4: Reef water quality agencies and investors amplify existing efforts of sharing success stories that centre on social, environmental and economic success to promote RWQIP objectives and prioritise economic gains for land managers.

Evidence

Our data provides evidence to support this response, and the following findings:

- The need for positive news stories about RWQ was a common thread across all participants,
- Farmer interviewees clearly expressed a need to have their farms considered as a business by the government, with a focus on triple bottom line narratives and practice
- Some NRMs reported success in reframing their messaging about farming as a dynamic business, and experienced positive results from this angle,
- Negative narratives were dominant and seen as damaging to the tourism industry.

There was a perception from participants that farmers felt they were being unduly targeted as the source of poor water quality conditions on the Reef. Farmers and land managers felt the voices in the debate were too narrow, with city dwellers and urban areas not included in the media narratives. Several of the industry peak bodies expressed similar attitudes in the media communications labs.

The need for positive news stories on RWQ activities was a common thread across all project datasets. However, journalist interviewees indicated that RWQ stories only get traction when able to generate or perpetuate conflict.

Farmers sought more engagement in the media narrative. They were asked what topics would be of most interest to them to increase their responses and continued involvement and re-engagement.

According to the farmer data, the following narrative types would strengthen participation in the narrative from that end-user group:

- More articles on innovation in farming practice applied successfully by other farmers, particularly as shown by the most important theme and concept – soil – which is a reflection of the importance of improving soil health in increased farm business outcomes.
- Media seek more positive news stories about farmers' general public narrative on water quality.
- More articles with a balanced approach gained through presenting alternate and opposing viewpoints on management practices that contribute to sustainable Reef health.

- The media's positioning and role in the water quality narrative also provided a clear insight. The media were seen as a conduit rather than agenda-setting participants in the RWQ narrative.
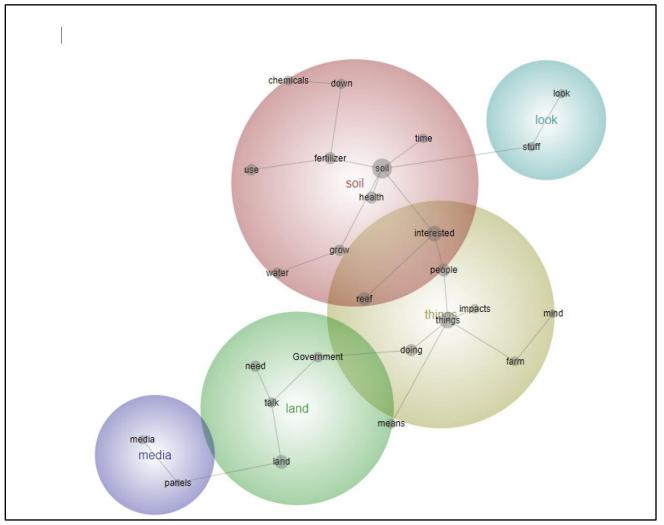
FIGURE 19. FARMERS' TOPICS OF INTEREST TO INCREASE NARRATIVE ENGAGEMENT, VIA LEXIMANCER

Other data from farmers

Community media taken from industry-related land management organisations found that community narratives might influence RWQ management practices. However, the focus of the discourse is on many other aspects of the Reef, with little emphasis on water quality management. Given the small sample, we can only surmise that the strength of the messaging may be weakened.

Farmer interviews clearly expressed a need to have their farms considered as a business by the government. This means that all changes sought by policymakers needed to recognise associated costs.

Farmers sought positive engagement for farm-led research aimed at practices that increased their business values, with NRM/government providing supportive services to facilitate change rather than imposing compulsory requirements. NRMs stated they minimised their connection with Reef protection agency media releases as a means of protecting their relationships with farmers. Some NRMs reported success in reframing their messaging to farming as a business with positive results.

Expected impact

- Increased financial margins for the agricultural sector in the Reef catchment.
- Increased uptake of positive measures and generation of innovations that support RWQ improvement and the greater social good.
- Increased trust between farmers and the government.

Analysis

Here we adapt Paxton's notion of a 'battling adversity frame' (Paxton, 2021) and apply it to the RWQ media narratives. A battling adversity frame found in media narratives on drought has similarities with media narratives on water quality. A battling adversity frame presents "rural producers as 'battlers' in an adversarial, competitive relationship with drought and weather" (Paxton, 2021).

Further evidence suggests farmers are trying to have some control over water quality narratives and media reporting. But a lack of focus on urban and rural actors, could disadvantage farmers in the water quality narratives.

"I think that farmers are getting a bit of a broad-brush treatment by the mass media when it comes to …doing the wrong thing. It's no different with the mistreating of backpackers, you know, we all wear the bad name for the guys who are doing the wrong thing, you know that's just how it is," (north Queensland farmer)

In the drought example, a hardship narrative often emerges and it is, "tapping into and building existing social and cultural capital and reifies existing social identities, categories and bonds" (Paxton, 2021). The data suggest that the negative framing is an extension of existing narratives in other areas of agriculture. Negative narratives continue to focus on one group of people because of the small range of voices being either put forward or sourced.

Farmers were asked what could be done to open the Reef water quality narrative. The heat mapping below shows red as the most important topic through to purple as the least important topic to increase narrative participation for farmers. The Reef is outside of industry, information and people. Significantly, there are no direct linkages between industry, communication, farmers and the Reef.

Farmers also flagged a need for positive media news stories about water quality practices across all media types would be beneficial and less likely to single them out in the RWQ media narratives.
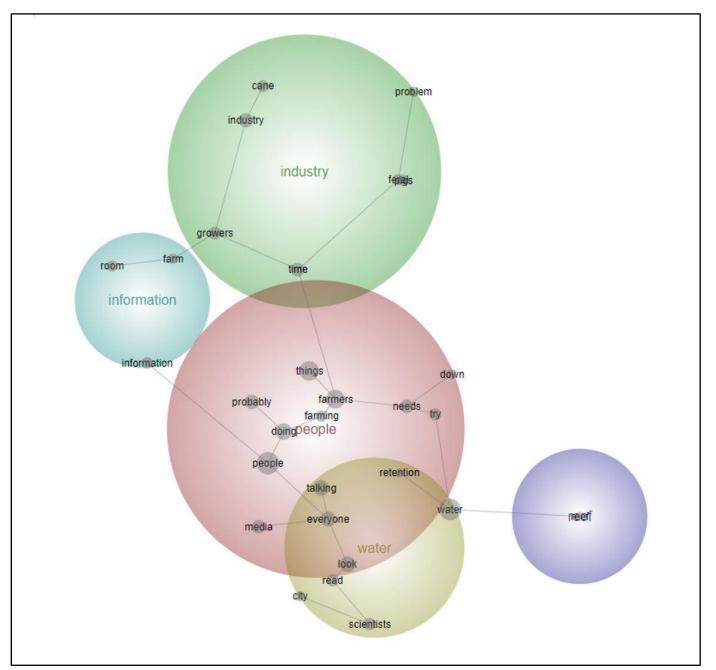
FIGURE 20. FARMERS PERSPECTIVE ON OPENING THE WATER QUALITY NARRATIVE VIA LEXIMANCER

Note: Leximancer is a heat mapping visualisation where red is most important through to cooler colours as least important. The size of the bubble represents the size of the concept present in the textual data. A full explanation of how Leximancer diagrams work is contained in the Appendix D: Leximancer methodology.

Recommendations

Enhancing current strategies to get outcomes

- Collaborative discussions with farmers to identify pilot studies that minimise inputs (cost savings in time/money and increases in output) that benefit the farm business while positively impacting RWQ, such as cropping methods that reduce the number of pesticides required.

- Inclusion of farmers in the narrative, including on-farm visits (either virtual or physical) to understand their businesses and innovative practices would be beneficial for both media professionals and government stakeholders.

- More focus is needed on triple-bottom-line good news stories. The triple bottom line is a business concept that posits firms should commit to measuring their social and environmental impact, in addition to their financial performance.

Response 1.5: Reef water quality agencies and investors decentralising increase awareness of messaging to a local level to include areas outside of service area issues beyond metropolitan (Brisbane) and regional centres (Townsville).

Evidence

Our data provides evidence to support is covered by the following findings:

- Journalists suggest RWQ stories do not generate media interest as they lack connection to areas outside Brisbane, Townsville and Cairns,
- Journalists and industry have a sense of disconnect between regional and metropolitan audiences, and
- Traditional media dominates RWQ media narratives. They are at the centre of any Reef media system network. They work with industry and environmental/conservation groups.

"And it's almost impossible [to get hold of a Minister] in Queensland at the moment. It's a very closed shop. They prefer to do their media through their own social media avenues, drop to papers and so forth" (north Queensland journalist).

Journalists have a sense that the state departments only respond to good news stories. A lack of state government representation in areas outside of Townsville and Brisbane adds to existing concerns around trust. This potentially increases the sense of disconnection between media and government, thus creating a sense of disconnect with the main gatekeepers.

Traditional media and farmers also work together, with several editors and journalists

commenting that they go out to rural areas and 'have a yarn' with farmers to source stories and get tips on stories that might be coming up in the near future.

Expected impact

- A stronger awareness of RWQ issues at a local scale generates more trust.

- In adhering to the   old journalism phrase – 'If it's local, it leads' – to increase connectivity with a wider audience.

- Frame communication of marine action from land points of reference: AIMS will describe a reef not as the Great Keppel and the Capricorn bunkers, but between Gladstone and Rockhampton.

> *A more trusted source would be someone that [sic] lives locally in the community that people know, that people have met, it comes back to finding someone that people can identify with that they know from the community that doesn't have a political agenda"*
> *(Central Qld journalist)*

Recommendation

- **Increase the regional presence of the government and opportunities for partnerships with established local networks:** This could be achieved through existing networks, including Reef protection agencies and investors and the scientific community working on the Reef with citizen scientists.

- **Greater inclusion of urban voices:** A sense of connecting water quality narratives with urban communities, not just farming and land managers, was strongly communicated across the interviews as a means to opening the debate on RWQ narratives. Farmers sought more engagement in the media narrative – they were asked what topics would be of most interest to them to increase their responses and continued involvement and re-engagement.

Part Three: Navigating the RWQ media system: Applied Processes and Practices

Introduction

In this part, we set out a series of responses to the findings by way of offering solutions to improving behavioural changes through media narratives. In Part One and Two we identified the main narratives, meta-narratives and media processes and practices that form the overall RWQ media system Building on the Reef media narratives and meta-narratives, we frame the practical application as a program logic.

Program logic – a model that sets out the resources and activities that comprise the program, and the changes that are expected to result from them. In this study, it sets out the narrative, meta-narrative and actors that comprise the RWQ media system and a set of responses, recommendations and practical applications that identify areas of change that are expected from this study.

Practical Application: Applied Measures and Practices

The following pages provides details of the measures and solutions to work with the existing RWQ media system to improve behaviour and encourage social good.

Measure 1.1: Reef water quality agencies and investors increase their use of plain language in their communications to simplify and reach more people with clear messaging.

Evidence

The evidence to support this response is covered by the following findings:

- The literature review identified the accessibility of language as a known barrier for the community to connect with governmental policy documentation.
- Some journalists said they were not using government press releases as they lacked relevance, preferring to tell stories as if telling a yarn.
- The desktop review shows that many Reef protection agencies are relying on the same language to communicate with each other, to the potential exclusion of the broader audience (see **Figure 23**).

DES media clippings	Reef Catchments fact sheets	NRM annual reports	Reef Rescue Marine Monitoring Program (RRMMP)	Reef WQ report cards	Scientific Consensus Statement
Regions	catchment	reef	reef	reef	reef
Catchment	reef	regions	regions	waters	waters
Reefs	loads	Waters	waters	regions	region
Waters	targets	monitoring	monitoring	monitoring	reports
Targets	water	Corals	corals	Box held a date which we have removed	monitors
Loads	island	islands	islands	quality	quality
Queensland	quality	Quality	seagrasses	figure	figure
Bodies	sediment	seagrasses	quality	Box held a date which we have removed	corals
Managers	priorities	Report	report	reports	Box held a date which we have removed
Quality	grazing	sampling	sampling	corals	seagrasses

FIGURE 21. ACROSS DIFFERENT RWQ COMMUNICATION FORMATS, THE LANGUAGE IS THE SAME, ALTHOUGH THE AUTHORS AND ORGANIZATIONS DIFFER. THE BOXES ARE COLORED TO CORRESPOND TO THE REPETITION OF THE SAME WORD

Applied approach

The sources used in the figures 24 and 25 are as follows

- Reef Rescue Marine Monitoring Program annual reports (2009-2011)
- Reef Catchments fact sheets NRM (2012-2013)
- Media clippings from Qld DES (sample)
- Reef Water Quality report cards (2009-2018)
- NRM annual reports (2008-2019)
- Scientific Consensus Statement (2017)

We have devised a new lexicon for simplifying the language used in Reef protection reports.

MOST COMMON
GOVERNMENT TERMS

Recommended media-
friendly equivalent terms

MOST COMMON WORDS FOUND IN RWQ REPORTS. NOT IN NUMERICAL ORDER	RECOMMENDED MEDIA-FRIENDLY EQUIVALENT TERMS
Reef	The Reef
Waters	rivers or seas/ocean
Water Quality	quality of the water/habitat
Regions	areas
Monitoring	investigating or measuring
Reports	investigations/document/ the source (of that new information)
Catchment	river system/area
Management	land management/property management/crop management
Corals	corals
Quality	improvement
Indicators	achievements
Seagrasses	seagrasses/ kelp
Islands	Islands / outcrops/isthmus
Loads	levels
Change	new plans; new direction
Ecosystem	habitat
Land	as in managers - graziers
Marine	sea
Harbour	port
Governments	authorities or rangers, officers
Collectively	together
Covers	lead, or encompasses
Climate	weather patterns
Queensland	state (Queensland)
Source	original
Sampling	taking measurements
Concentrations	examples/higher numbers
Priority	urgency/at the top of (the list etc)
Sediment	dirt/chemicals/what's left
Community	groups/organisations/members
Site	town/region/area/city/farm
Increasing	more of/greater numbers
Pollutant	poisons/ chemicals/ plastic / natural causes / algae
Nitrogen	nitrogen

FIGURE 22. EXAMPLES OF CONVERTING BUREAUCRATIC LANGUAGE INTO PLAIN ENGLISH LANGUAGE (AS ADVISED BY FORMER JOURNALISTS, AND MANAGING EDITORS FROM AUSTRALIA'S LARGEST MEDIA ORGANISATION)

Differences between the two can be seen in absence of the words "people", "farmers", "story" or "local" all of which are terms identified in the characteristics of the news media interviews (see figure 24). This lack of 'human dimension' in the reporting and the over complex language is adding to a confused narrative. A need for simple language is reiterated by journalist interviewees whose role includes providing information in 'plain English' terms for a wider audience.

The data shows audiences understand the term 'water quality' and 'run off' interchangeably. The farmers interviewed explained the term 'water quality' as demonstrating understanding consistent with the scientific literature meaning in an environmental context, whereas journalists often use run off as water quality meant the standards of drinking water.

Recommendations

- Make more use of social media beyond the existing language (See figure 27) and talking to other Reef protection agencies. This can be in the form of alternative narratives such as strengthening management practice/land management practices.

- Indigenous farming and caring for country practices, and more inclusion of community and industry voices.

- Using simple, tangible language in the narrative should be more accessible and relatable to wider sectors of society, which could also assist in overcoming issues of trust. We propose the following language can be used in place of words identified as bureaucratic.

Measure 1.2: Reef water quality agencies and investors make more practical use of social media to counter the conflict narrative and misinformation about Reef water quality.

Evidence

The evidence, from the project to support this response is covered by the following findings:

- Farmers are distrustful of engaging in land manager stories and comments in public groups on social media but more comfortable responding within special interest groups.

- Farmer interviews show they try to avoid participation in online RWQ narratives completely because of the negative framing of land management practices, and concern over public responses.

"If it's [a story] not generating page views, and subscribers, then it's something that we're less likely to write about. …But the amount of environment news that we do, or **water quality news or anything like that is driven by the amount of people, reading that. So that is one of our main drivers at the moment, and probably one, I don't think we've probably done as much work on that water quality.** Obviously, we do a bit with the cane farmers, because they've got an interest in speaking out against it and this bit of political sort of political arggy bargy in that space. …unless that's something controversial, probably won't get as much go …that's in a new online world anyway" (North Queensland editor).

- Journalist interviews indicate Facebook and other feedback mechanisms (letters to theeditor, clicks on stories) are a 'pub test' to gauge public reaction over Reef WQ issues.

- All participants signalled that Facebook is the key social media source to communicatewith public, industry body members and the media.

Recent studies of populations in rural, regional and remote Australia identified are NRM-related end-users are prepared to use **social media platforms** to obtain articles and information relating to their businesses, and connect with local, national and global interest groups (Given, Winkler, & Hopps-Wallis, 2017). Our results show RWQ end-users are active across several social media platforms, the types of content and stories that they would prefer to engage with, and the positive sentiment they are seeking.

Applied approach

We have devised a checklist for using social media for social good. This check list can be used to evaluate and enhance existing social media engagement (see over page).

Make greater use of social media to generate alternative languages. In addition, apply a social media for social good approach.

The Great Posts Checklist: Using Social Media for Social Good

Does your post:

☐ Align with the business plan, marketing objectives, social media goals & evaluation metrics.

☐ Have a clear target audience on the proposed posting platform.

☐ Maintain 'real-time' relevance through a short time frame from creation, to approval, to posting.

☐ Use framing of importance to your target audience e.g. a positive financial, practice improvement or new technology focus benefitting farmers.

☐ Authentically speak to the target audience using plain language to build trust with your organisation.

☐ Leverage special holidays & events and celebrate good news stories.

☐ Align with previous posts producing high positive engagement from the target audience e.g. through likes, shares and comments.

☐ Have effective content e.g. use colour, movement, image or video quality and follow the 'Rule of Thirds' in composition.

☐ Capture diversity of voice & imagery in the target audience e.g. a variety in age, gender, culture; and rural, urban & industrial perspectives.

☐ Encourage feedback from your target audience to 'close the loop' on posted content: with organisational support structures for handling negative feedback.

FIGURE 23 A CHECK LIST TO USE SOCIAL MEDIA FOR SOCIAL GOOD DEVISED FROM DATA IN THIS PROJECT.

Measure 1.3: Reef water quality agencies and investors increase their engagement with the Reef WQ narratives by supporting more ways to participate, including the use of social media.

Evidence

The evidence to support this response is covered by the following findings:

"Environmental groups are reluctant to have a voice in the narrative as we're dependent on government funding," (Media and Communications Lab participant)

- Journalists seek conflict that produces increased 'click through rates', meaning traffic to their websites and online social platforms, generating business income (see interview section).

- Media lab discussions informed us that environmentalist had little knowledge of innovations in farming practice as they relate to Reef WQ.

- Farming stories were siloed within farming sectors, rarely filtering to public domains. NRMs also acknowledge narrative conflict stating Reef WQ stories are too politically driven.

Applied approach:

Exemplar: A recent example of industry narratives working with DES, is a story about Reef Credits.

This project involves government, industry and farmers. The story covers a quote from each of the parties, giving a good overview and strong sense of collegiality, co-design and clear communication.

IN QUEENSLAND NEWS · POLITICS · BUSINESS · CULTURE

NEWS   BUSINESS   OPINION   POLITICS   CULTURE   STATEWIDE   REAL ESTATE   MEDIA ACADEMY

Credit where it's due: NQ scheme pays farmers for not damaging the reef

Tuesday
tober 19, 2021

STATEWIDE

The waterways of north Queensland are rewarding farmers who reduce their fertiliser run-off with a new income stream.

Banker turned cane farmer, Peter Anderson, is among five sugar producers to have shared in payments for 18,000 reef credits courtesy of the Queensland Government.

As part of a deal announced 12 months ago, the Queensland Government and HSBC purchased $1 million in reef credits that will be paid to growers who reduce their fertiliser run-off.

Brad Cooper / nsland Regional Specialist

The modelling for calculating nitrogen saved has been established by Green Collar, which operates as a type of 'middleman' or facilitator of the transaction.

Recommendations

- Amplify the current Department media communications strategy in light of new data in the field, including this report.

- More monitoring and response into identifying and targeting misinformation. A deconstruction or the existing misinformation narrative would identify the course and provide ways to counter misinformation.

- Control the media message ahead of major announcements working with individual journalists and providing access to scientists, policy makers, farmers and industry partners.

- Extend current social media network to include non-Government organisations, business and industry with active engagement in content across suitable platforms.

Measure 1.4: Communication experts from Reef water quality agencies and investors, develop practical ways to streamline existing approval processes, and increase response times for traditional and social media to participate effectively in the Reef WQ narrative.

Evidence

The evidence to support this response is covered by the following findings:

- Industry and peak body communicators tell us they work closely with the media.

- Journalists revealed the business model, due to technology adoption, has changed with the news cycle; now reducing from 24 hours to hourly news updates.

- Several journalists reporting delays in response time from funders and government means they have a stronger relationship with the NRMs and environmental groups.

We're not a newspaper anymore. We're an online news service… It's not like the old days where it's for the paper the next day, these are for stories that evolving quickly and over time... I don't think they're [governments] nimble enough to cope with the fastness of the news cycle now, the speed of the news cycle," (north Queensland newspaper

In recent years, the Queensland media landscape has become a centralised process, making media governance difficult to attain. Outside of the major news events (elections, natural disasters, etc.), news agendas are today decided by algorithms and data. As one senior journalist describes, the business model focuses on converting clicks in subscriptions and advertising.

Similarly, journalists reported going directly to farmers instead of the government. Farmers use traditional media platforms to engage with journalists, but not government agencies.

Under the new business model, the practice of reporting has changed to evolve stories during the day, whilst some authorities and other primary sources remain in the old 24 hours news cycle model. Digital online reporting has replaced hardcopy newspapers in many cases within the Great Barrier Reef catchment area. (North Queensland editor)

Overall, these become barriers in strong communication, as they feed into a lack of engagement, leading to a decline in trust, engagements and worsening relationships and feedback loops involving the gatekeepers, traditional media and the wider public.

The data reflects previous work that the expectation from the public is for a quick response, without which alternative sources of information will be sought. Alternatively, there becomes an opportunity for misinformation and disinformation to become more prevalent.

"We'd more likely go directly to a farmer and say, 'Hey, does this impact you at all? If so, would you like to have a chat?' normally, they're happy to speak on it if they know enough about the topic," (Central Queensland journalist).

Recommendations

- Review approval processes to streamline content response times and proactively manage the release of contentious content.

- Monitoring of social media sites for trolling comments: Farmers are distrustful of engaging in land manager stories and comments in public groups on social media, but more comfortable responding within special interest groups.

- Create a feedback loop strategy to enable media outlets and Reef communicator's partners to engage with the government and Reef protection agencies.

Synthesis of Data: Barriers and Enablers

Introduction
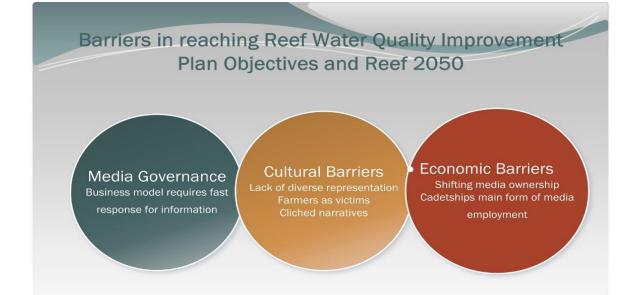
This final section looks at the high level themes that also emerge from this study. There were three barriers preventing engagement in the RWQ media systems which will need further investigation

The interview data provides a wealth of examples of barriers in the media narratives to more transparent communication - potential areas to enable better communication. There are three overarching barriers within which sits several subsets – see **Figure 26** below for details.

We also outline in more detail how to use social media for social good, changes in the media business model and future areas of research.

We've got early deadlines that we need to meet. And I've got guys who start working at six o'clock in the morning, who are home at three o'clock. It's not like the old days where it's for the paper the next day, these are for stories that evolving quickly and over time," (north Queensland journalist).

Barriers to improved behavioural change in RWQ media narratives

FIGURE 25: THREE BARRIERS TO IMPROVING RWQIP MEDIA NARRATIVES

The three main barriers to improving media narratives are:
1. Media governance,
2. Socio-cultural, and
3. Economic.

Media governance: A dynamic media system

Media governance is the rules that aim to organise media systems. More broadly, anyone who produces professional media content and adheres to the media regulation landscape in each country. In recent years, the Queensland media landscape has become a centralised process, making media governance difficult to attain.

Working with recent changes in Reef water quality system

New Media business models

The Australian and Queensland media landscape has changed rapidly since 2016. In Queensland, four media companies have been dominant over time: News Corp Australia (formerly News Ltd), Nine Publishing/Fairfax, the Australian Broadcasting Corporation (ABC) and Grant Broadcasters.

TABLE 6. CHANGES TO QUEENSLAND'S MEDIA LANDSCAPE THAT EFFECTS WATER QUALITY NARRATIVES

News outlets that have closed down since 2016			
	Cape York Weekly launches, replacing the closed Cape York News. September 2020	Port Douglas and Mossman Gazette	**Bowen Independent**
	Herbert River Express	The [Atherton] Tablelander	**Northern Miner**
	Burdekin Advocate	Whitsunday Coast Guardian	**Nine News Mackay - closed its regional newsrooms in Toowoomba and Mackay. February 2019**
New print newspaper / news outlets since 2020	Cairns Local News, a free weekly newspaper. September 2020	Australian Associated Press opens a bureau in Townsville	**Highlands Leader in Emerald launches. July 2020**
	Burdekin Local News. September 2020	Bundaberg Today (Star news Group). September 2020	**Callide-Dawson Leader covering the Banana Shire. July 2020**
Other:	Gladstone Observer moves to online Only	Rockhampton Morning Bulletin moved to online for six months	
Broadcast closures	**Townsville Win TV regional news**	**Cairns Win TV regional news**	**Rockhampton WinTV regional news**

Following the 2016 federal election, News Corp bought up the Australian Provincial Newspapers (APN) stable of 60 regional newspapers, 30 news websites, and 12 daily newspapers (Blaine, 2019). The purchase increased News Corp's stranglehold on the state by an additional 60 publications. When News Corp launched its online versions, merging their online and print operations in 2008, they held 70% of Queensland's newspaper readership.

In 2019, the Nine network sold their Australian Community Media (ACM) stable, including the *North Queensland Register* newspaper, to Thorney Investment Group, owners of the classified property website Domain.com.au, in April 2019. *The North Queensland Register* is Australia's oldest rural weekly, established in 1891. In the same year, News Corp closed or moved many of their bi-weekly newspapers online. The smaller bi-weekly papers have closed due to economic shifts and changes in their business model (See **Table 6)**

in that digital online world. If we wait until the paper deadline, the story is it's just taking off, like so much has happened, so much happens in 24 hours." (far north Queensland editor)

The quotes here show how not only have lots of outlets closed down, or are moving online, it has changed the entire business model, and one that want to be part of the narrative need to adapt to

Cultural barriers

The data shows audiences don't always understand the term water quality; anecdotal evidence suggests some see water quality relating to drinking water quality, not the Reef. This data supports Cook et al. (2017) work on debunking miss and disinformation. We suggest three ways to link water quality to existing plans and policies.

- Relatability with bespoke examples to the different Reef zone and end-users,
- Simple unified messaging in collaboration with other Reef and land management agencies, and
- Human focus, not business or government focus.

"*Yeah, I use the word water quality. And agricultural runoff is something we use as well."* (Central Queensland chief of staff).

In addition to Cook et al., (2017) three ways of simplifying the languages are:
1. Avoid scientific jargon or complex, technical language,
2. Well-designed graphs, videos, photos, and other semantic aids can be helpful to convey complex or statistical information clearly and concisely, and
3. The truth is often more complicated than some false viral claim. You must invest effort in translating complex ideas, so they are readily accessible to the target audience, so they can be easily read, easily imagined, and easily recalled.

Further, focusing on simple, tangible language should also assist in overcoming issues of trust.

Economic barriers

Two major economic factors influence media narratives – 1) changes in News Corp business model, and 2) a fear of government funding being withdrawn from environmental groups if they are overly critical.

Changes in the Reef media ecological landscape: Environmental and advocacy business models

Economics is a further barrier to behavioural changes in water quality narratives. As noted above, there have been major economic shifts in the Queensland media landscape. Results from the media communication lab with the conservation and community environmental groups show a reluctance to engage in the water quality debate and broader climate debate surrounding the Reef.

Australian environmental groups are often reliant on government funding under tax-deductibility and other funding streams.

"We get through so much data every day about who's been reading what stories, we try and point our journalists to write the stories that people want to read. It's about that model of trying, then that [way we] don't have as much time to write stories that we think people should read," (north Queensland

[we're] reluctant to have a voice in the narrative as we're dependent on government funding" (Environment MCL participant)

We also identified a perceived form of 'false-balance reporting' (Cook et al., 2017; Koehler 2016; & Dixon, 2013) when there's a disproportionate representation in the media reporting that is not reflective of the consensus around an environmental issue. Further analysis is needed to see if 'false-balance reporting' is in effect, or the environmental groups have confirmation bias and sit within their echo chamber.

Table 7 summarises the main barriers and how they can be enabled.

Barrier indicator	Value	Action
Media governance **Perceived lack of local/ on-ground understanding of issues** **Different use of language**	Siloes communication loops	Increasing presence and awareness of local issues that relate to Reef water quality. Potential town hall events or designated person to cover a patch (could be remotely based)
	Incomplete communication loops in the narrative	Clearer feedback loops between decision-makers, land managers and the wider public
Cultural Barriers • Complexity in language • Trust • Victimhood • Established narratives • Relevancy	A perceived notion that funders and government communication strategy and language are intangible, with too much technical content focus of communications.	Human interest focus on language
	Perceived lack of social capital (trust) in the drivers and agendas of information sources	Deep dive look at identifying switching points Development of feedback loop. Human interest/livelihood focus on language
	Perceived culture of blame that includes farmers feeling as though they are targeted as a scapegoat in media narratives	A broader understanding and opening up of voices, including urban voices
	Misinformation and perceived culture of pre-conceived ideas & uncertainty surrounding media narrative on Reef health	Control of switching points; generate opportunities to control the narrative
	Local stories and being told receptively to a local audience, but do not cut through with a broader audience – not a strong enough 'So what'	Local focus, local people
Economic Barriers **Shifting media landscape, new business models** **Perceived impacts on funding if conflict**	Polarising narratives to generate more income	Control of switching points; generation of windows of opportunity to control the narrative
	A complex issue that's hard to explain in public spaces that have time restraints (short bulletins) and limited attention spans (from the audience)	Media communication training; webinars and blogs; social media messaging; short videos
	Funding models are adding another complicating overlay (environmental groups?)	

Social media for social good

The use of social media on the GBR generally and/or in relation to including GBR water quality issues specifically is scant and predominately relates to data collection and citizen science in biophysical or smaller scale platform use by some end-user groups in human dimension studies. We did not find any literature specifically on the use of social media for social good in the RWQ context.

For organisations in the RWQ space, research into social media platform use provides opportunities for key organisations to access communities of interest and extend the legacy domains of previous studies to build social resilience to water quality change (Gooch, Butler, Cullen-Unsworth, Rigano, & Manning, 2012). There is also the ability for organisations to use social media networks to monitor public support for policy changes, particularly in environmental policies with scientific dissent (Aklin & Urpelainen, 2014).

Sub-recommendations

Summary of academic and grey literature

These outcomes from the grey and academic literature reviews suggest that:
- Agricultural and land-based practices are seen as closely connected to RWQ narratives,
- A sense of place and need for conservation were prominent themes,
- Most media literature focuses on the media messaging and historical context, and
- Media focused literature looks at the Reef in context of policy, political decision support systems, and climate change.

Summary of social media narratives

The findings on platform preferences for current narrative end-user groups are:
- Twitter was the least used platform by farmers, and the most heavily used by journalists,
- Facebook users were most likely to be on multiple social media platforms, with YouTube or Instagram the most likely combinations,
- Younger farmers used YouTube for education purposes, specifically for information on innovative farming practices internationally that were not available through local sources,
- Facebook is the main social media platform used by farmers to discuss and respond to water quality with NRM and journalists, but not with the government,
- Facebook is the main communication channel used by journalists to source stories and gauge how farmers react to those stories, and
- Facebook is predominantly used by journalists to facilitate feedback from the general public on the interest in media stories around water quality and Reef stories.

Summary of most common themes from the interviews with journalists (including editors and chief of staff)

The key findings from the 14 journalist interviews were:

- Journalists felt that the relationship between their media outlet and the Department was one-way, with the department only responding to interviews requests with Ministers on good news stories.
- That there is a lag-effect in the response time between media requests for Ministerial comment from the Department, and industry practice (news cycles can be less than 2 hours)
- Media practitioners tend to use more '**human interest**' language when reporting on land management and farming stories.
- The most common terms journalists use **'Reef', 'Story',** and **'People', 'farmers'** is interchangeable with '**land managers**' and **'agriculture'**, along with **'run-off'** in preference to water quality.
- A sense that Reef protection agencies weren't aware of local and hyperlocal issues, outside of Townsville and Brisbane. This sense of dissociation generated a sense of disconnect between regional and metropolitan audiences.
- Journalists use Facebook as a communication channel to source stories and gauge how farmers react to and facilitate feedback on media stories around water quality and Reef stories more broadly.

Summary of farmer interviews

Farmers expressed a need for greater participation in the RWQ narrative. When asked what topic/s were of most interest that would produce sustained engagement with the RWQ narrative they said:
- more articles included in the RWQ narrative that allowed for a balanced approach gained through presenting alternate and opposing viewpoints,
- more social media posts across more platforms using short videos and case studies on run-off mitigation, and
- more positive news stories from the general media about farmers' public narrative on water quality.

Recommendations

Response	Recommendation
1.1	Reef water quality agencies and investors manage trust of government messaging to reduce misinformation (information not intended to cause harm) and an existing narrative void.
1.2	Reef water quality agencies and investors collaborate with industry, environmental groups and science communicators to escalate awareness of RWQIP and Reef 2050 objectives.
1.3	Reef water quality agencies and investors represent a diverse range of representation (gender, indigeneity, ethnicity, age, etc.) to generate a sense of community ownership is in achieving RWQIP and Reef 2050 objectives.
1.4	Reef water quality agencies and investors amplify existing efforts of sharing success stories that centre on social, environmental and economic success to promote RWQIP objectives and prioritise economic gains for land managers.
1.5	Reef water quality agencies and investors decentralising increased awareness of messaging to a local level to include areas outside of service area issues beyond metropolitan (Brisbane) and regional centres (Townsville).

Practical applications:

TABLE 9. SUMMARY OF THE PRACTICAL APPLICATIONS

Measure	Recommendation
2.1:	Reef water quality agencies and investors increase their use of plain language in their communications to simplify and reach more people with clear messaging.
2.2:	Reef water quality agencies and investors make more practical use of social media to counter the conflict narrative and misinformation about Reef water quality.
2.3:	Reef water quality agencies and investors increase their engagement by expanding their existing network of communicators outside of intergovernmental agencies.
2.4	Communication experts from Reef water quality agencies and investors, develop practical ways to streamline existing approval processes, and increase response times for traditional and social media to participate effectively in the Reef WQ narrative

Future areas of research

The legacy of this project is to move towards **Phase Two** and **Phase Three** under the Program Design: A Conceptual framework as presented under the Theory of Change (refer **Figure 5**).

Phase 1 has completed the project activities through data collection and a participatory process which has achieved the original **Error! Reference source not found.** of this work.

> This project had has three aims:
> 1. To establish a baseline understanding of Reef water quality media narratives,
> 2. To find standard communication practices and challenges (synthesis/analysis) in Reef water quality media narratives, and
> 3. To seek solutions and find future pathways for best practice in communicating water quality narratives for behavioural change.

The next phase - Phase 2 should consider how this information can develop policy and a suite of programs to achieve maximum research impact. This could include pilot studies, monitoring and evaluation of the practical applications and products, identification and creation of windows of opportunity to debunk misinformation, ways to demonstrate leadership and develop the important work begun here.

Such applications are examples of impacts envisioned in Phase 2 (policy and program development) under the Theory of Change, and might be designed around the following activities:

- Identify a baseline of the existing representation of gender, indigeneity, ethnicity, age etc. in Reef protection agencies' communications channels.
- Extend this study by establishing a baseline of what are the RWQ national and international media narratives and meta-narratives.
- Explore further areas that deconstruct and debunk misinformation and disinformation. For example, the uncertainty over Reef health is a narrative that has been open to misinformation, challenging the science that the Reef is healthy or only including the outer Reef in the misinformation.
- Understand how to increase social media for social good.

The RWQIP sits within a connected within a system that is dynamic and rapidly changing. To achieve the goal of good water quality to sustain the outstanding universal values of the Reef requires a strategic approach that evaluates the entire system and the role of media narratives at significant points of change in the media system. Whilst this study benchmarks the Reef media system in 2020-2021, future strategic approaches will be supported by a) a re-benchmarking of our understanding of the media system, b) evaluation of risk assessment and practices to debunk misinformation and c) review of processes that reflect industry practice, in particular shifting business models and baselines.

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Appendices

Appendix A: Method background of desktop review

In the desktop review, we found the linguistic tropes of water quality and run-off were not registering high on the media narratives. This project has identified that existing media narratives are far more complex than a hypodermic needle model some suggest is applied. The 'Hypodermic needle model' sometimes referred to, as the 'Limited effects model' is an idea that people are spoon-feed information. We consume the information without questioning the ideas presented or the context and drivers of a media message. That there is no challenge to the messaging, because the audience is passive in its consumption of media messages.

To test this assumption, we sourced the academic literature from two standard collections: Web of Science and Scopus. Both collections were searched from 2013-2020 only, commencing with the search term "Great Barrier Reef". Although searches were restricted to the domains of Social Sciences and Arts/Humanities, Web of Science nevertheless yielded significant numbers of cross-disciplinary papers that still needed to be excluded if they were also coded from Science disciplines such as Oceanography, Meteorology, and Fisheries and so on.

Narrower searches were conducted using the search string '"news" or "media"', with manual searches ensuring that these searches did not miss any relevant papers. Results from these searches were combined to remove duplicates, books and book chapters, resulting in a total of 136 papers, details of which were stored in an Endnote Database.

Table 1: Summary of academic literature search

Search	Web of Science	Scopus
"Great Barrier Reef" in Social Science/Arts Humanities, from 2013-2020	831	367
Remove remaining Science papers	323	
Remove out of scope papers (e.g. book reviews, papers from unrelated social science disciplines such as archaeology, and those focusing on unrelated topics such as recreational fishing)	207	
Search within these for "news" or "media".	Number too low to be reliable (14), particularly as additional	102

	manual search within 207 revealed several in scope papers not captured.	
Manual search for relevant papers	104	39
Combine searches across the two collections, remove duplicates, and remove books and book chapters	136	

Endnote software was used to organize the academic literature, using both standard Endnote fields to assist in retrieval of full papers, and project-specific fields to assist in coding of the literature (Table 2).

Table 2: Systematic review coding fields

Standard Endnote fields	Project-specific fields
Record Number	Rating
Author	Stakeholders
Year	Methods
Title	Type of paper
Journal	Type of media
Abstract	Themes
Keywords	Problem framing
URL	Expected outcomes
	Pathways
	Legacy

Each of the 136 academic articles on the Great Barrier Reef was manually given a Rating from 1 (lowest relevance) to 5 (highest relevance) stars, depending on the degree to which water quality messaging knowledge was advanced. Seven articles were given a 5 star rating, and 23 were given a 4 star rating. These 30 articles were thus identified as the most relevant, with the remainder retained for context-setting and cross-checking purposes, but not analysed in detail.

Grey literature and water quality narratives
Grey literature was searched using Proquest, CSIRO Research Publications Repository, and online publication databases of the Australian Institute of Marine Science, and the Reef and Rainforest Research Centre. The string "Great Barrier Reef" was searched in news items, reports and working papers between 1 January 2000 to July 2020. A total of 578 items were found on the first search. A second clean up reveals a total of 49 relevant items.

- ProQuest returned 104 Reports and Working Papers. These were examined for social science content (i.e. include only social science, not science, reports), leaving 30 (although

some of these seem to be duplicates). These were stored in Endnote[i].

- CSIRO database returned 67 Reports. These were manually examined for non-Science content (i.e. include only social science, not science, reports) and excluding CSIRO only internal reports, leaving 11. These were stored in Endnote[ii].
- Australian Institute of Marine Science returned 399 Multidisciplinary Sciences items. Within this, searches on terms such as 'social' and communication revealed no relevant papers.
- Reef and Rainforest Research Centre returned 8 reports. This involved a manual search within 'Water Quality' Science. These all draw on NESP reports[iii].

Appendix B: Interview questions

Interviews were conducted over Zoom or telephone and each was recorded, including with a back-up device. The project description and informed consent were read at the start of each interview and the participants verbally agreed to the terms. The interviewer explained the aims of the project, the expected outcomes, and the aim of the interview. It was made clear that participants could stop at any time, and that if they wished to retract any comments following the interview, they are free to do so. The following statement was read out and included in the recording for each interview.

"Hi xx, thank you very much for agreeing to this interview. My name is xx and I am a researcher at JCU. This interview is part of a project in which we are looking at the understanding how media and community narratives influence water quality behaviour. We think that water quality communication has an important role to play in guiding the future of reef management, including restoration, and we want to make sure your views are accounted for in the research space. We are not providing any judgement on what you have done or are planning to do; we just want to know more about your motivations."

The interviews were semi-structured, with questions used a guide rather than being a prescriptive process. Each interview was between 20 and 90 minutes (about 1 and a half hours) in duration. Table below provides the indicative questions and goals for end user interviews. Lists indicative questions asked to traditional media, farmer, and industry groups.

Interview Transcription
All audio data was run through transcription software otter.ai (https://otter.ai/) and saved as a raw Word document. The document was then checked by cross-referencing the script against the audio recording, correcting any errors from the automated transcription. Typical changes across all draft scripts included proper nouns, particularly location names; correcting words interpreted incorrectly (for example 'Roof,' 'Brief,' 'Race' and 'Rape' to 'Reef'); and replacing portions of missing text that were omitted by the software. If words and phrases were repeated – as is the case with natural speech – they were simplified and an ellipsis added to show the removal of words, or a pause (for example, "you're going to get that, that, that negative," to "you get that… negative"). Anything that was still unclear after playing back that section three times, was marked with square brackets holding a question mark and highlight. Intercede reliability (O'Connor, C., & Joffre, H. (2020) was tested by members of the team who listened back over the audio to clarify some of these uncertainties and confirm accuracy in the transcription. In all cases, any unidentifiable words occurred in sections where a lack of clarity on the exact word did not influence the meaning of the sentence, and therefore, the ability to code it and deduce meaning remained. Other factors, like laughter and background noise, were not included in the transcription. The completed transcriptions and recordings were shared between coders to ensure that the independent coders were evaluating the characteristics of the interviews to reach the same conclusion.

Appendix C: Interviews with farmers and media representatives

This aim of this participatory process was to increase the understanding of the results obtained so far via the desktop review and generate further evidence through a qualitative participatory process. The first phase of this involved conducting a series of interviews with landholders from a variety of industries and a range of media professionals.

Farmer interviews occurred between February and April 2021. One-on-one interviews with farmers is recommended as best practice when speaking with farmers for data collection (Butler et al., 2013), providing accurate context and to protect commercial and privacy interests. Recruitment was via email requests through natural resource management (NRM) groups and snowball sampling techniques from the research teams' contacts across the Reef catchment area.

The study design obtained farmer representation across all major agricultural industry sectors in the Reef catchment, including grazing, cropping, and horticulture, and sugar cane, goats, aquaculture and wool production. The design was also successful in providing participation opportunities across the Reef catchment. There was representation from farmers in Cape York, Wet Tropics, Burdekin, Mackay Whitsundays and Fitzroy regions (*Note: The Burnett-Mary was not included in this study*). Response bias (SAGE, 2012) was managed by asking alternative researchers to interview participants known socially to farmers. A total of 24 farmers were interviewed for this study. All farmer interview data were de-identified.

Participatory process

We held a series of online, telephone and face-to-face interviews with key stakeholders from traditional media, industry and farming (grazing, cane, and horticulture) and as a subset of each we identified associated social media. See **Figure 3** for a breakdown of the qualitative data sources.

The interview data was then used to inform questions asked in media communication labs for each of the groups. An iterative process saw participants identified by the research team during team workshops, and the steering committee provided insights into who should be involved in both the interviews and the media labs to ensure that the sample encompassed many of the key stakeholders in the media narrative.

For instance, the list of media and industry participants was supplied to the steering committee for review and to provide an opportunity to offer additional suggestions. Once the interviews started, additional participants were added to the list via snowball recruitment; i.e. interviewees suggested other appropriate contacts in the Great Barrier Reef catchment.

NUMBER OF PARTICIPANTS FROM EACH SECTOR AS %

Environmental and conservation groups
11%

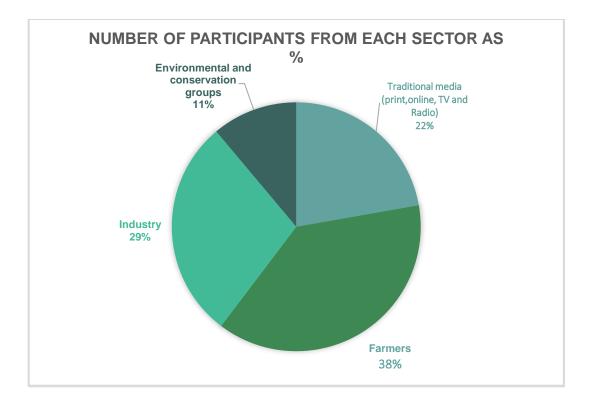Traditional media (print,online, TV and Radio)
22%

Industry
29%

Farmers
38%

Figure 3. Participants by sectors as a percentage of total participants. (N=XXX)

Appendix D: Leximancer methodology

The following provides an overview of the methodology used for thematic analysis conducted on various datasets within the responses collected during Interviews and Media Labs. Each section then provides specific information on the results obtained from this methodology.

Thematic Analysis - A thematic content analysis systematically reduces text into themes for interpretation and is a suitable methodology for RP227's inductive approach (Frey, 2018; Silverman 2016). Thematic analysis is commonly used on qualitative data such as interview transcripts, survey responses and social media platform data (Lyons & Coyle, 2021). The literature contains application of thematic analysis in studies on farming practices and climate change. In RP227, thematic analysis was chosen for the analysis of interviews and media lab data where the responses contained significant amounts of text from participants and interpretation of this information sought to know something about people's views, opinions, knowledge and experience.

Data Analysis Tool - Leximancer 4.5 software (Leximancer) was the data analysis tool chosen to assist with thematic analysis for the project. The text responses were loaded via a CSV file into Leximancer. The advantage of using Leximancer is in the ability to reduce researcher induced bias through the application of automated coding to form concepts and themes (Frey, 2018; Sotiriadou, Brouwers, & Le, 2014). Leximancer algorithms use seed words to generate concepts by recognising two sentence text blocks. An evidentiary thesaurus is generated and used to form concepts. The size of the concept indicates is importance within the text. The concepts then form clusters which are recognised as themes by their special proximity. An interactive concept map is produced showing themes and concepts. These themes are heat mapped into themes from most important (red) to least important (purple). The largest concept within a theme is used to name the theme. This automation process allows the researcher to focus their time on analysing and interpreting the results (Biroscak, Scott, Lindenberger, & Bryant, 2017).

Data Reliability - An interactive map was generated for each question set response recognised as requiring thematic analysis where Leximancer was used to assist the analysis. The topical mapping functions were selected to show direct relationships in the data, as it produces more stable results than alternate Gaussian mapping functions (Leximancer, 2018). A test-retest process was applied to this data for each analysis to confirm reliability of the data. This involved the regeneration of the data map and examination for any changes in the way that map had formed and linked concepts. Where the map reproduces in a consistent way for at least 7/10 iterations, the data was considered suitable for thematic analysis using Leximancer.

Interpretation of Results – The concept map was then analysed in terms of the concepts and themes generated arose from the dataset, rather than applying a presupposed structure from the literature (Weber, 1990; Frey, 2018). There was no researcher modification of themes names or concepts, other than where stated in the relevant sections e.g. for minor matters such as merging concepts used in the same context that are plural word forms such as 'look' and 'looking'. The content analysis contained a conceptual analysis to identify the existence of concepts within the text

and a relational analysis to consider the proximity and strength of links between the identified concepts (Price et al., 2015). An interpretation was then made of the results in the context of the existing literature and used to form the basis of project recommendations.

Appendix E: Best practice example

IN QUEENSLAND NEWS • POLITICS • BUSINESS • CULTURE

NEWS   BUSINESS   OPINION   POLITICS   CULTURE   STATEWIDE   REAL ESTATE   MEDIA ACADEMY

Credit where it's due: NQ scheme pays farmers for not damaging the reef

Tuesday
tober 19, 2021

STATEWIDE

The waterways of north Queensland are rewarding farmers who reduce their fertiliser run-off with a new income stream.

Banker turned cane farmer, Peter Anderson, is among five sugar producers to have shared in payments for 18,000 reef credits courtesy of the Queensland Government.

As part of a deal announced 12 months ago, the Queensland Government and HSBC purchased $1 million in reef credits that will be paid to growers who reduce their fertiliser run-off.

Brad Cooper / ...sland Regional Specialist

The modelling for calculating nitrogen saved has been established by Green Collar, which operates as a type of 'middleman' or facilitator of the transaction.

Print article

This snippet from news outlet, *InQueensland* is a good best practice example.

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