



OceansIQ

Ocean Literacy Survey Report 2022



■ Acknowledgements

OceansIQ is a not-for-profit dedicated to improving ocean literacy and sharing ocean stories by resourcing marine educators to inspire, engage and encourage the exploration and protection of our blue planet. We're achieving this with scientist interviews, searchable species databases, imagery libraries and other tools that will assist in building ocean literacy nationally and internationally.

We'd like to extend an ocean of gratitude for the work, generous funding and in-kind support provided by the Unico Conservation Foundation who made this report possible. It will be an invaluable tool to ensure that ocean literacy is represented and supported in the Victorian curriculum into the future.

Initial guidance and expertise was provided by Dr. Prue Francis from Deakin University and Jeff Weir from the Dolphin Research Institute. We'd also like to thank Professor Grahame Coleman and Aashna Tāpia of Melbourne University for analysing the results of the survey, Sheree Marris from the OceansIQ Advisory Board and the Unico Conservation Foundation Board for editing and shaping the final report with special mention to Professor Annette Gough for her contribution.

We also extend many thanks and appreciation to all of the marine educators and experts who took the time out of their busy schedules to participate in the survey.

Last but not least we want to acknowledge the primary author of this report, world respected ocean literacy expert and consultant Harry Bredahl from Nautilus Educational. Harry has spent his life committed to ocean literacy and has been pivotal in keeping ocean literacy on the agenda in Australia. He is also founding member of the Marine Education Society of Australasia (MESA), the Australian Association for Environmental Education (AAEE) and the International Pacific Marine Educators Association (IPMEN) where he is the IOC-UNESCO Ocean Literacy Working Group representative. We're also please to announce that Harry is also a Member of the Oceans IQ Advisory Board.

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■ Executive Summary

The State of Victoria has a proud history of supporting marine education efforts. Driven by passionate volunteers this was where the Marine Education Society of Australasia (MESA) and the Australian Association for Environmental Education (AAEE) were founded. However, according to Gough A, (2017), one key unaddressed issue is the fact ocean themes are still almost entirely absent from the Australian National Curriculum.

This underlines why OceansIQ and the Unico Conservation Foundation, with the support of Deakin University and key stakeholders, conducted a Victorian Ocean Literacy Survey. Targeted at marine educators across a diverse range of sectors it was designed to establish a benchmark for ocean literacy, identifying barriers to its adoption and actions that need to be taken to support its sustained and contemporary delivery into the future. The survey will become a tool to lever change.

The survey results revealed one other key element contributing to the absence of ocean themes in Australian schools, the fact that most Australian educators lack the time, training and expertise in marine education topics. Many feel ill-equipped to include ocean themes in their teaching schedules. Where it does exist in Australia, marine education is marginalized, localized and often idiosyncratic. More critically, there is still no clear consensus on what is important to include in the classroom. A systematic consensus derived approach to marine education has yet to be adopted in this nation.

This is magnified by the fact that marine education isn't funded or prioritised in Victoria, particularly compared to well-funded and publicized tropical environments climates, even though they are arguably just as valuable if not more so. As a result, despite being in an age of increasing environmental awareness, the Australian public, especially along the cooler southern shores are still largely unaware of the importance of the ocean in their lives and the impact that their lives have on the ocean.

In 2004 a collective of USA-based marine educators and marine scientists addressed similar issues in their nation by developing the concept of ocean literacy. This concept does offer a systematic, consensus derived and inclusive approach to marine education that has now been adopted around the globe. Because it is also highly appropriate across Australia, the role of ocean literacy in this nation is the foundation underwriting the development of this OceansIQ survey.

It is noteworthy that the United Nations Decade of Ocean Science for Sustainable Development (2021 to 2030) has commenced. The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO) has taken the lead in developing UN Ocean Decade education programs that have been based on a combination of ocean literacy and the UN Sustainable Development Goal SDG 14. The reports produced by IOC-UNESCO have set clear targets regarding the adoption of ocean literacy for member nations such as Australia.

Given that Australia has been a leader on the international marine education scene, it is well placed to address the challenge of meeting the IOC-UNESCO ocean literacy in the UN Ocean Decade targets. The results of this survey clearly support this and can be used to build educational capacity. It is an opportunity for Victoria to lead the way for ocean literacy and develop a model that can be rolled out nationally. The report identified a number of recommendations and a clear path forward to achieve this which included:

- Development of a Victorian Ocean Literacy Reference Group.
- Provision of contemporary, scientifically robust and locally relevant curriculum aligned resources that embed the ocean literacy principles and also provide important background information for educators.
- Engagement and collaboration with Indigenous and non-English speaking communities.
- Pre-service and professional development programs to empower and give educators the confidence to teach ocean literacy across the curriculum.
- Creation of an Ocean Literacy Portal - a 'one stop shop' for ocean literacy with a range of interactive communication features including a compendium of resources.
- Promotion of Victorian education providers across the full spectrum of formal and informal delivery.
- Adoption of the more globally accepted and encompassing terminology 'ocean literacy'.
- Acknowledge and set in place emerging terminology including Australia's "Great Southern Reef", highlighted and equitably emphasised in the south as the Great Barrier Reef is in the north.
- Nurturing and working with national and international projects and partners, utilising their expertise, e.g., International Pacific Marine Educators Network (IPMEN) to develop relevant scope and sequence guidelines that can be adopted in Victoria and, more generally in Australia.

A crucial factor in ensuring the success of any ocean literacy effort is to secure long-term program funding. It is no longer viable to rely on the volunteer efforts of passionate educators. A program of this magnitude needs to be well funded and include a Program Manager to facilitate ocean literacy efforts, guide the direction of efforts and support educators to build capacity and make change happen. A mixture of State Government and philanthropic investment is required to ensure not only the program's relevance, longevity and success but also as a meaningful step towards a healthy ocean and sustainable human health into the future.

■ Introduction

At the beginning of 2022 OceansIQ conducted a survey of marine education providers in the Australian state of Victoria in order to acknowledge the life-saving role that the ocean plays in the health of humankind and, indeed, the entire planet. The survey was undertaken to measure and establish a benchmark for understanding and degree of ocean literacy by educators. It identified barriers as well as remedial actions required to support sustained and contemporary delivery into the future.

The study provided an opportunity to leverage the expertise of a network of marine educators and resources within the state with the provisional idea of establishing a state-wide user-friendly compendium. This public resource would provide an improved forward pathway towards improving a comprehensive marine education approach into the future with an expectation that better understanding can lead to attitude and behavioural change as a lead in to positive action.

■ Categories

A total of 32 responses from a wide range of organisations were received (Appendix 1. Survey Participants). The services being offered were broken down into the following categories.

- Classroom based
- School excursions
- School incursions
- Field studies
- Virtual presentations
- Volunteer/community groups
- Eco-tourism
- Citizen science
- Other

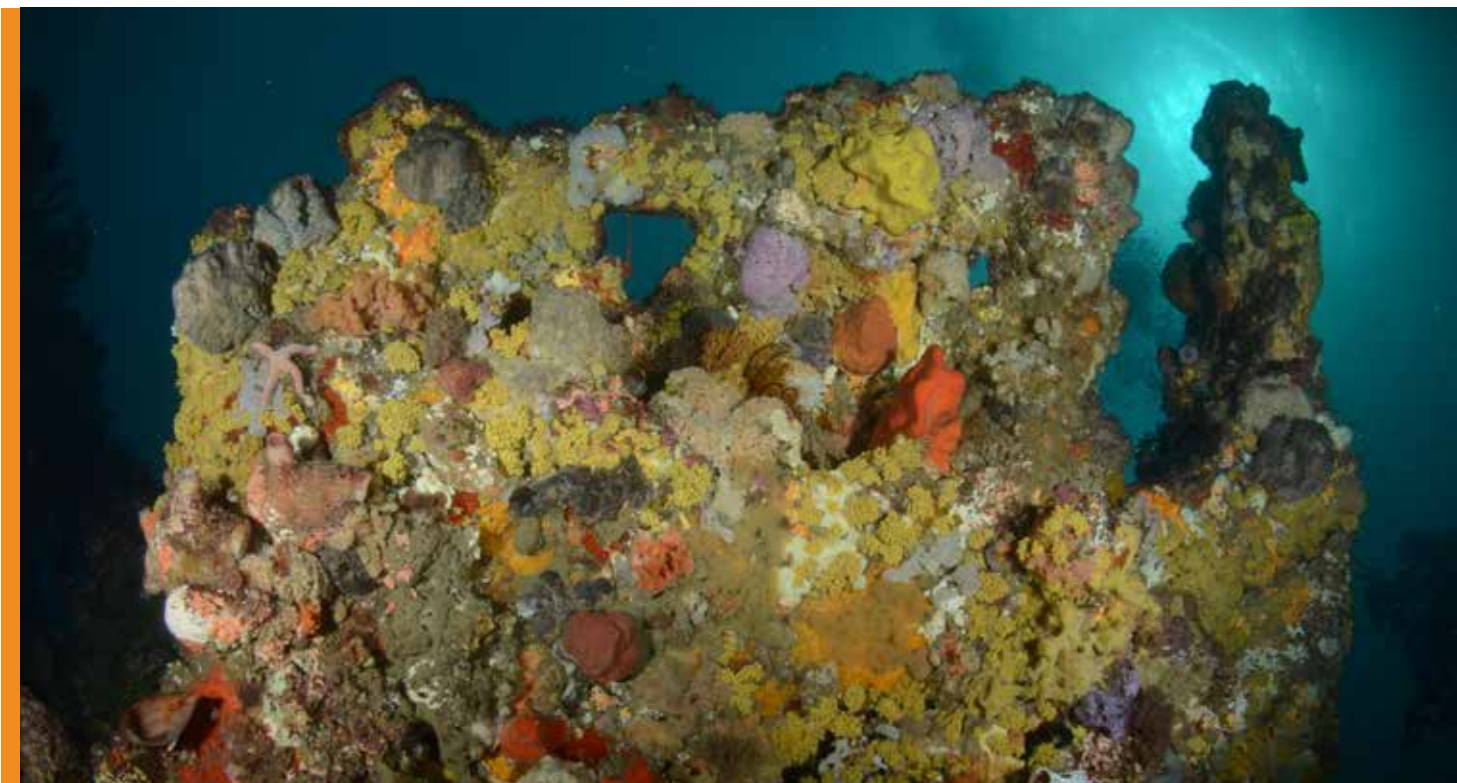
■ Services

Included under the other response were services including:

- Resources for Teachers (3),
- Higher Education (2),
- Teacher Workshops (1),
- Multimedia Platforms (1)
- The Offering of National Marine Awareness Programs (1).

These responses represent a good coverage of marine education providers in the state of Victoria and the results listed above reflect the inclusion of a wide range of audiences and delivery styles.

The term “marine education” has been used here because it has been the traditional way to refer to coastal and marine educators and providers here in Australia for the last 40 years. However, the key focus of this survey introduces two relatively new initiatives that are now being adopted around the globe - ocean literacy and the United Nations Decade of Ocean Science for Sustainable Development (2021 to 2030). Both of these important initiatives are discussed below.





■ Setting the Scene

Ocean Literacy

Ocean literacy is a terminology concept that was first developed by a collective of USA-based marine educators and marine scientists in 2004 but has now been adopted across the globe. The original definition of ocean literacy:

Ocean literacy is an understanding of the ocean's influence on you and your influence on the ocean. An ocean-literate person

- Understands the essential principles and fundamental concepts about the ocean;
- Can communicate about the ocean in a meaningful way; and
- Is able to make informed and responsible decisions regarding the ocean and its resources.
-

A key component of ocean literacy, one often referred to in this survey, relates to the fact that the originators of this concept have created 7 Essential Principles of Ocean Literacy. These 7 Essential Principles (listed below) comprised 45 Fundamental Concepts that can be viewed or downloaded in the Ocean Literacy Guide. Initially developed in the USA, these 7 Essential Principles have now been adopted on a world-wide basis.

- **Principle 1:** The Earth has one big ocean with many features.
- **Principle 2:** The ocean and life in the ocean shape the features of Earth.
- **Principle 3:** The ocean is a major influence on weather and climate.
- **Principle 4:** The ocean makes the Earth habitable.
- **Principle 5:** The ocean supports a great diversity of life and ecosystems.
- **Principle 6:** The ocean and humans are inextricably interconnected.
- **Principle 7:** The ocean is largely unexplored.

UN Ocean Decade

The second relevant initiative is the United Nations Decade of Ocean Science for Sustainable Development. In 2017 the United Nations declared 2021 to 2030 as the Decade of Ocean Science for Sustainable Development with a vision to deliver “the science we need for the ocean we want”.

Rather than setting specific targets for UN member states, including Australia, the aim of the UN Ocean Decade is to provide a platform opportunity for organisations, communities, nations and regions to collaboratively supercharge action for a sustainable ocean future.

The main motivation for the UN Ocean Decade is to support efforts to reverse the cycle of decline in ocean health and create improved conditions for sustainable development of the ocean. Society now depends on the ocean more than any time in the past. For example:

- The ocean covers over 70% of the planet and influences everything about it.
- Half of the oxygen on earth is produced in the ocean.
- The ocean regulates our weather and climate.
- The ocean and ocean related resources drive our economy.

The ambition of the UN Ocean Decade is to provide a ‘once in a lifetime’ opportunity to create a new foundation, across the science-policy interface, to strengthen the management of the ocean.

As part of this significant international initiative, the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (IOC UNESCO) has taken the lead in developing UN Ocean Decade education programs that have been based on a combination of ocean literacy and the UN Sustainable Development Goal SDG 14. The aim of SDG 14 is to “conserve and sustainably use the oceans, seas and marine resources for sustainable development”.

It is important to note that although the UN Ocean Decade does not set targets for member states such as Australia; the documents produced by IOC UNESCO do set clear targets and guidelines.

As a member state of UNESCO, Australia is obligated to meet those targets and adopt those guidelines.

■ Survey Results





The main section of the OceansIQ survey contained 20 questions. Qualitative analysis of the responses was undertaken by Aashna Tapia and Professor Grahame Coleman from Melbourne University. Ocean Literacy expert, Harry Breidahl, consolidated the analysis and combined with his 50 years of industry experience formulated this report. The results are outlined below.

■ **Question 1: Is there a need to improve ocean education?**

Analysis: 32 responses - all yes.

A total of 15 respondents provided additional comments but these comments often reflected the specific areas of operation of each provider. However, they share one general theme and that is that ocean education in Victoria (and, more generally, Australia) is critically important but under-resourced and generally ignored in both the formal and informal education settings. The role of ocean literacy in addressing this issue was often highlighted.

■ **Question 2: Is there a need for positive action for the ocean in Victoria?**

Analysis: 31 responses - all yes.

15 respondents provided additional comments, but these comments often reflected the specific areas of operation of each provider. A number of these responses focused on the importance of understanding and protecting Victoria's unique marine ecosystems.

■ **Question 3: How much do you know about the UN Ocean Decade, on a scale of 1 to 5 - with 1 being the least and 5 the greatest? Please select.**

Analysis:

- average rating 3 - 25%
- not familiar at all - 12.5%
- slightly familiar - 25%
- moderately familiar - 12.5%
- very familiar - 25% extremely familiar.

It is important to note that more than half of the respondents were not well aware of the UN Ocean Decade and that must now be an area that needs to be addressed.

■ **Question 4: How much do you know about the 7 Ocean Literacy Principles? On a scale of 1 to 5 - with 1 being the least and 5. Please select.**

Analysis:

- average rating 3.3 - 30%
- not familiar at all - 1%
- slightly familiar - 14%
- moderately familiar - 20%
- very familiar - 35% extremely familiar.

It is important to note that more than half of the respondents were not aware of ocean literacy and this finding highlights a second area that requires action.

■ **Question 5: Do you currently use any of the 7 Ocean Literacy Principles or any other aspects of ocean literacy in your marine education programs?**

Analysis: 29 responses

- 20 = yes (62.5%)
- 9 = no (28.1%)
- With 17 respondents providing additional comments.

For those respondents who did know about ocean literacy, it is encouraging to see that most have incorporated the 7 Ocean Literacy Principles in their education programs. On the other hand, those who didn't have a good knowledge of ocean literacy had (obviously) not included the 7 Principles in their programs. One comment sums up such a response and that is "Obviously, I need to know more, my 45 year old bachelors in Zoology seems out of date". There was only one slightly negative but, nonetheless, significant response and that was "Too many sets of rules and advice and we are all very busy in our volunteering lives". As with the findings from Question 4, the negative responses here highlight the need to facilitate a greater understanding of the role that ocean literacy can play in addressing the clearly identified call to improve ocean education in Victoria and, more generally, Australia.

■ **Question 6: Indicate which of the 7 Ocean Literacy Principles apply to your resources/programs.**

Analysis: there were 32 responses in the checkboxes.

The results below highlight a fairly even spread of uptake of each of the 7 Principles. Interestingly, Principle 5 ranks highly while the up-take of Principle 7 ranks as the lowest. It is believed that this reflects a somewhat natural bias in this state towards marine biology while the open ocean and, in particular, the exploration of the open ocean is less commonly addressed (at present).

- **Principle 1:** Earth has one big ocean with many features = 20 (62.5%)
- **Principle 2:** The ocean and life in the ocean shape the features of Earth. = 22 (68.8%)
- **Principle 3:** The ocean is a major influence on weather and climate = 25 (78.1%)
- **Principle 4:** The ocean makes Earth habitable = 19 (59.4%)
- **Principle 5:** The ocean supports a great diversity of life and ecosystems = 31 (96.9%)
- **Principle 6:** The ocean and humans are inextricably linked = 27 (84.4%)
- **Principle 7:** The ocean is largely unexplored = 17 (53.1%)

Ocean education in Victoria (and more generally, Australia) is critically important but under-resourced and generally ignored in formal and informal education settings.

■ **Question 7: What audiences do you provide marine education/action services to?**

Analysis: there were 32 responders for the checkboxes provided. However, some providers supply multiple services across various audiences as evidenced in the percentages. This represents an even spread of audiences across Victoria.

- Preschool = 14 (43.8%)
- Primary = 24 (75.0%)
- Secondary = 24 (75.0%)
- Tertiary = 21 (65.6%)
- General public = 23 (71.9%)
- Corporate/government = 11 (34.4%)

■ **Question 8: Other than your own, do you use any other Victorian Marine Education/Ocean Literacy resources in your programs? If yes, please list.**

Analysis: there were 31 responses

- 15 = yes (49.9%)
- 16 = no (50%)

A wide and diverse range of resources were listed in the written responses with the following qualitative analyses of the open-ended questions (Table 1) provided by Professor Coleman. Although this resource list was extensive, most were locally produced resources while specific ocean literacy themed resources were not listed and that again highlights an area that now needs to be addressed.

Table 1. Frequency (n= 33) and proportions (%) of different types of Victorian Marine Education/Ocean Literacy resources identified by participants.

Types of resources	Frequency	Proportion
Governmental or environmental groups	7	21.2
Specialists/Guest Speakers/Presenters	3	9.1
Books/Posters/Manuals	5	15.2
Film/Talks	4	12.1
School subjects	2	6.0
Websites	3	9.1



■ **Question 9: Are there any national or international resources that you use? If so why and what are they?**

Analysis: As with the responses to Question 8, a wide range and diverse of resources were listed in the written responses listing national (Australian) or international resources with the following qualitative analyses of the open-ended questions (Table 2) provided by Professor Coleman. The main Australian resource listed was the MESA website while main international resources included NMEA (a key ocean literacy website) and UNESCO-IOC documents. The work that has already been done by USA based colleagues in NMEA to develop scope and sequence guidelines is one key initiative that should be adopted here in Victoria and, more generally, Australia.

Table 2. Frequency (n= 33) and proportion (%) of national and international resources identified by type.

Types of resources	National		International	
	Frequency	Proportion	Frequency	Proportion
Governmental or environmental groups	1	3.0	5	15.2
Specialists/Guest Speakers/Presenters	2	6.0	2	6.0
Books/Posters/Manuals	3	9.1	3	9.1
Film/Talks	1	3.0	1	3.0
School subjects	1	3.0	1	3.0
Websites	0	0.0	3	9.1

■ **Question 10: Do you incorporate behaviour change strategies in your marine education efforts? This extends to land-based activities which impact the marine environment. Please explain.**

Analysis: there were 31 responses

- 28 = yes (87.5%)
- 3 = no (9.4%)
- 20 (62.5%) providing additional written comments.

Although a variety of approaches to behaviour change strategies were outlined in these responses, one key response was “Staff in the Faculty collaborate with BehaviourWorks Australia, on evidence- based research and education”. The following qualitative analyses of the open-ended questions (Table 3) was provided by Professor Coleman and a more detailed analysis was included in Professor’s report.

Table 3. Criteria for distinguishing between evidence and nonevidence-based behaviour change strategies.

Behaviour-change strategies	Criteria
Evidence-based	Using theory-based primary or secondary resources such as government websites, documentaries, educational programmes and campaigns etc. as an education tool
Nonevidence-based	Using physical activities such as litter collecting and disposal, recycling plastic, reducing carbon footprint etc. as an education tool

■ **Question 11: What ocean literacy/marine education tools result in the most successful behaviour change strategies? What evidence do you have?**

Analysis: the responses to this question highlighted the range of approaches taken by the various marine education providers with the following qualitative analyses of the open-ended questions (Tables 4, 5 and 6) provided by Professor Coleman. It is important to highlight elements of some of these responses



“According to the literature, excursions to the natural environment seem to be a very effective way to establish a connection and promote understanding of the ocean, resulting in a positive change in people’s behaviour.”

“Action based learning creates the most behaviour change. Many of our resources have activities associated with them which students find motivating and interesting. We measure the impact of our resources through independent research and evaluation.”

“Taking action for the marine environment provides the most significant behaviour change.”

“It’s crucial to be clear about the separation between literacy and behaviour change. There is little evidence that literacy - i.e., awareness, knowledge and understanding changes behaviour.”

Table 4. Frequency (n= 33) & proportion (%) of participants who perceived different ocean literacy/marine education tools as most successful behaviour change strategies.

Ocean literacy/Marine education tools	Frequency	Proportion
Continued engagement over time	1	3.0
Outdoor excursions into the natural environment or sanctuaries	4	12.0
Taking action (e.g., tree planting, reducing litter, collecting data, campaigning etc.)	5	15.2
Published international peer-reviewed journal articles	3	9.1
Sustainability, plastic pollution and adherence to bag limits as established by the Victorian Fisheries Authority	1	3.0
Action based learning through relevant activities using visual and auditory stimuli	3	9.1
Exposure to real specimens or live animals	2	6.0
Volunteer programs and events (e.g., citizen science, Plastic Free July etc.)	3	9.1
Public presentations/pledging (e.g., bumper stickers or social media); book sales and local tours	2	6.0

Table 5. Frequency (n= 33) and proportion (%) of participants that identified different types of evidence supporting successful behaviour change strategies.

Types of evidence	Frequency	Proportion
Anecdotal	8	24.2
Peer-reviewed journal articles	3	9.1
Institutions’ research	2	6.0
Surveys	2	6.0
Research from recognized environmental organizations (e.g. Zoos Victoria)	1	3.0

Table 6. Criteria for distinguishing between anecdotal and experimental evidence.

Types of evidence	Criteria description
Anecdotal	Reports or observational evidence from unscientific methods or observers
Experimental	Observations generated under controlled and replicable conditions

■ **Question 12: In terms of Victorian-centric ocean literacy/marine education what resources are missing?**

Analysis: the responses to this question featured the range of approaches taken by the various marine education providers with the following qualitative analyses of the open-ended questions (Table 7) provided by Professor Coleman. Although Table 7 identifies one major response, namely “Easily accessible and centralized database with existing resources aligning with the national curriculum”. It’s also important to highlight elements of these responses:



“Easy-to-understand resources that teachers can pick up and use, with sufficient background information for them to teach confidently about the marine environment and its connection to us / land / weather.”

“Needs more inclusion in school curriculum “

“It’s not a lack of knowledge but often a lack of funds/time to translate that into services, programs or resources.”

“While there are educational resources relating to the ocean available for teachers, the supply of those that align with the national curriculum may be limited and educators might not know where to find.”

“More resources that mention the term ‘great southern reef’ would be wonderful for it to be part of everyone’s vocab like ‘great barrier reef’”

“I don’t think it is a question of specific missing resources - but more a pull- factor to create interest and appetite to include the marine in literacy programs. If we are talking about schools, then a collection of compelling stories to support an integrated curriculum approach would be valuable. “

Table 7. Frequency (n= 33) and proportion (%) of participants that identified missing resources in Victorian-centric ocean literacy/marine education.

List of missing resources	Frequency	Proportion
Larger capacity for experiential learning or in-field teacher training	2	6.0
Simpler resources with sufficient background information	1	3.0
Continued support from the Department	1	3.0
Higher supply of resources	1	3.0
Easily accessible and centralized database with existing resources aligning with the national curriculum	7	21.2
Modern curriculum-relevant materials (e.g., identification guides, posters, books, video content etc.)	2	6.0
More resources that directly link to the challenges faced by the eco-systems found in Victoria	2	6.0
Financial support	1	3.0
Research focusing on other marine environments (e.g., Great Southern Reef)	2	6.0
Resources for people from diverse backgrounds (e.g., with different physical/ mental abilities)	1	3.0
Virtual centre for marine education	1	3.0
Collection of compelling stories to support an integrated curriculum approach	1	3.0
Estuary discovery programs	1	3.0
Minimal application reporting requirements regarding project grants	1	3.0

■ **Question 13: What are the barriers to introducing Ocean Literacy into the Victorian State/Australian curriculum?**

Analysis: As with questions 10 to 12, the responses to this question featured the range of approaches taken by the various marine education providers with the following qualitative analyses of the open-ended questions (Table 8) provided by Professor Coleman. Although Table 8 identifies one major response, namely “Time constraints due to an over-crowded curriculum”, once again it is important to highlight elements of a few important responses:



“Not enough teachers with understanding of ocean literacy and how to deliver it within the curriculum. There is opportunity in the curriculum, but limited teacher knowledge / confidence.”

“According to the first research study from my thesis, the main barriers teachers are facing regarding the inclusion of ocean topics in their lessons are the lack of marine science knowledge and the low availability of ocean-related educational resources linked to the Australian curriculum. “

“We have not come across any barriers as we approach these topics from all curriculum areas.”

“The barrier is creating stories and services that solve problems for teachers rather than creating problems by adding more to their work. “

Table 8. List of perceived barriers

List of perceived barriers	Frequency	Proportion
Few references to the marine environment	2	3.0
Limited teacher knowledge, skills and confidence	9	27.3
Low availability of ocean-related resources and materials	3	9.1
Time constraints due to an over-crowded curriculum	8	24.2
Lack of enrolments	1	3.0
Lack of organizations with experts in the area or lack of a formal network for educators who specialize in marine education	1	3.0
Lack of funding support	2	6.0
Socio-economic or geographic factors may be barriers to conduct educational excursions	1	3.0
Lack of a defined, coordinated approach to ocean education nationally	2	6.0
Needs to be mapped to the updated Australian curriculum and not only state based	1	3.0
Covid	1	3.0
Government support to embed ocean literacy into the curriculum	2	6.0

The main barriers teachers are facing regarding the inclusion of ocean topics in their lessons are the lack of marine science knowledge and the low availability of ocean-related educational resources linked to the Australian curriculum.

■ **Question 14: What is the best way to overcome these barriers and integrate Ocean Literacy into the Victorian State/Australian curriculum?**

Analysis: There were 32 responses and, as would be expected with the collective expertise of the participants surveyed, a range of excellent responses was received, and there is a brief summary of responses in Table 9. The most significant response related to not making more work for teachers by developing easily accessible ocean literacy teaching materials that are linked to the current Australian Curriculum.

Table 9. Summary of responses to Question 14.

Overcoming barriers	Responses
Lobbying ACARA and politicians	2
Obtain long-term and secure funding	2
Create places for marine experts and leaders in schools	2
Other responses	2
Uptake of recent UNESCO-IOC UN Decade OL targets & actions	3
Not sure / no response	5
Pre-service and professional development programs	6
Develop easily accessible OL teaching materials that are linked to the current Australian Curriculum	10

■ **Question 15: How can we better engage and represent indigenous and non-English speaking communities in ocean literacy?**

Analysis: Also 32 responses and, as with Question 14, a range of responses were received which are highlighted in Table 10. “Acknowledging, listening to and engaging indigenous elders and communities” is a significant response.

Table 10. Summary of responses to Question 15.

Engaging indigenous and non-English speaking communities	Responses
Other responses	2
Not sure / no response	3
Produce relevant materials in a range of languages	5
Facilitate first-hand experiences for migrant communities	6
Acknowledging, listening to & engaging indigenous elders & communities	16



■ **Question 16: Maintaining & updating content in the Ocean Literacy Portal is vital. Can you offer suggestions on how this could be achieved/funded in the long term and any partnerships that would facilitate this?**

Analysis: Also 32 responses and, as with the questions above, a range of responses were received as per Table 11. These responses reflected the diversity of the respondents' backgrounds with no clear conclusion other than "not sure or no response". This represents the massive challenge that voluntary or not-for-profit environmental groups face today - how to secure on-going funding.

Table 11. Summary of responses to Question 16.

Ways to fund maintaining of the Ocean Literacy Portal	Responses
Other responses	2
Marine industries and corporations	2
Partnerships and subscriptions by users	4
Various levels of government funding	5
Philanthropy	5
Not sure / no response	14

■ **Question 17: How do you envisage the Ocean Literacy Portal in helping you to deliver Ocean Literacy/ Marine Education outcomes?**

Analysis: 32 responses again and, as with the questions above, a range of responses were received which are seen in Table 12. These responses also reflected the diversity of the respondents' backgrounds but provide two clear conclusions - "foster collaboration and links between organisations" and "establish an easily accessible information hub for a range of audiences". It's important to note that there was one negative response "not sure it will" which will be expanded on in the Concluding Remarks.

However, the responses share one general theme and that is that ocean education in Victoria (and, more generally, Australia) is critically important but under-resourced and generally ignored in both the formal and informal education settings. The role of ocean literacy in addressing this issue was often highlighted throughout this survey.

Table 12. Summary of responses to Question 17.

Ways the Ocean Literacy Portal will deliver outcomes	Responses
Not sure it will	1
Screening programs directly into classrooms	1
Other responses	2
Foster collaboration and links between organisations	7
Not sure / no response	10
Establish an easily accessible information hub for a range of audiences	11

■ **Question 18: What tools/resources would you like to see in a portal?**

Analysis: The responses to this question were mixed (see dot-points below), reflecting the diversity of the respondents and the organisations that they represent as well as multiple points made per respondent. This will be expanded on in the Concluding Remarks.

- Downloadable printed materials = 20 (62.5%)
- Service providers directory = 21 (65.6%)
- Online videos and photos = 22 (68.8%)
- Curriculum integration hints and tips = 26 (81.3%)
- Curriculum materials for Primary & Secondary Schools = 25 (78.1%)
- Publications = 18 (56.3%)
- Interviews and links to scientists = 20 (62.5%)
- Ocean Encyclopedia - Marine life ID = 20 (62.5%)
- Community groups directory = 15 (46.9%)
- Volunteering opportunities = 18 (56.3%)
- Marine research organisations directory = 18 (56.3%)
- Tertiary marine science studies = 14 (43.8%)
- Marine citizen science projects = 24 (75.0%)
- Other = 5 (15.6%)

■ **Question 19: Do you have any other comments or suggestions?**

Analysis: 32 responses that were mixed and that is understandable for such an open-ended question. An attempt to summarise these responses is featured in Table 13 with further commentary on two highly appropriate final comments in the Concluding Remarks. The responses share one general theme that ocean education in Victoria (and, more generally, Australia) is critically important but under-resourced and generally ignored in both the formal and informal education settings. The role of ocean literacy in addressing this issue was often highlighted throughout this survey.

Table 13. Summary of responses to Question 19.

Do you have any other comments?	Responses
No comment but often with a thank you	18
Some form of positive reflection with a thank you	7
"This won't be an easy task"	5
Detailed reflections in my Concluding Remarks	2

■ **Question 20: Would you like to read the draft report of the results?**

Analysis: 32 responses - 29 = yes 3 = no.



■ Concluding Remarks

The survey result is based on the responses from a list of the 32 organisations. Given the collective experience of the principle author and supporting project partners and stakeholders, it represents a fair cross section of marine education providers in this state. Collectively, this group brings an excellent range of experience and knowledge to the survey and we greatly respect the commitment reflected in their detailed responses.

- 1.** Questions 1 and 2 are general scene setting questions where the answers reflect the clear conclusion that is universal agreement that there is both a need for positive action for the ocean in Victoria and a need to improve ocean education (in this state).
- 2.** Because the focus of this survey related to the prospect of creating an Ocean Literacy Portal, Questions 3 to 6 related to the role of ocean literacy in the context of the UN Ocean Decade. The main takeaway is that slightly more than half of the respondents were not well aware of either the UN Ocean Decade or ocean literacy. The link between ocean literacy and the UN Ocean Decade was especially clear in the survey and some respondents were well aware of this link and subsequently highlighted the recent work of IOC UNESCO in this area. See more commentary in Question 19.
- 3.** The responses to Question 7 are highly relevant because they clearly reflect an even spread of audiences across Victoria.
- 4.** Questions 8 and 9 relate to the resources currently used by respondents. and, as would be expected with such a diverse group of organisations, the results highlight a wide range of resources used. While there are a diverse range of resources currently used, a challenge for a proposed Ocean Literacy Portal would be what resources to include and what not to include. Additional commentary about international resources are highlighted in the responses in Question 19.

5. Questions 10 and 11 relate to ocean literacy and behaviour change. A range of approaches taken by the various marine education providers with regard to ocean literacy and behaviour change. Overwhelmingly action based and excursions to the natural environment were identified as the most effective way to establish a connection and promote understanding of the ocean, resulting in a positive change in people’s behaviour. The separation between literacy and behaviour change needs to be clearly delineated as there was believed to be little evidence that literacy changes behaviour. This warrants further investigation.

6. Question 12 related to the elements currently missing from ocean literacy / marine education in Victoria and there was one clear area identified and that was “an easily accessible and centralized database with existing resources aligning with the national curriculum”. That response was supported by a number of other responses highlighting the need for a range of other (ocean literacy) teaching resources which should be made easily accessible.

7. Questions 13 and 14 related to the barriers to introducing ocean literacy to Victoria. Firstly, Question 13 focused on the barriers and there were two clear responses - “limited teacher knowledge, skills and confidence” and “time constraints due to an over-crowded curriculum”. The majority of the other responses related to the absence of ocean themes in the Australian Curriculum, the lack of resources and funding issues.

The responses to Question 13 were followed-up in the responses to Question 14 which focused on the best ways to overcome these barriers. The first main response was to “develop easily accessible OL teaching materials that are linked to the current Australian Curriculum”. This must form part of a broader strategy. A 1990s Federal Government funded project called Coast and Marine Studies in Australia, was developed however ultimately uptake failed as it needed to be part of an on-going commitment to resource, engage and train teachers. Simply producing high quality and easily accessible teaching materials will not, in itself, result in a major uptake of these materials.

The second main response to Question 14 focused on proposing “pre-service and professional development programs”. Experience creating and presenting the only pre-service marine education unit at an Australian university (EDF 4219 at Monash University - 1990 to 2014) and presenting at many marine education professional development programs, showed that professional development and the development of teaching materials are clearly linked, especially within the context of the proposed Ocean Literacy Portal. Although it was only represented in three responses the “uptake of recent IOC UNESCO UN Ocean Decade literacy targets and actions” is also worthy of note here and will be addressed in response to Question 19.

Question 15 addresses a really important but often neglected area and that relates to finding better ways to engage and represent indigenous and non-English speaking communities in ocean literacy and the responses were clear. As far as indigenous communities go “acknowledging, listening to and engaging indigenous elders and communities” clearly stood out as a response while the combination of two responses “produce relevant materials in a range of languages” and “facilitate first-hand experiences for migrant communities” stood out. Although accepting and implementing these responses represents a much higher level of resourcing and time commitment for any future ocean literacy initiatives, they are, nonetheless, clearly articulated recommendations that must be acknowledged as such.

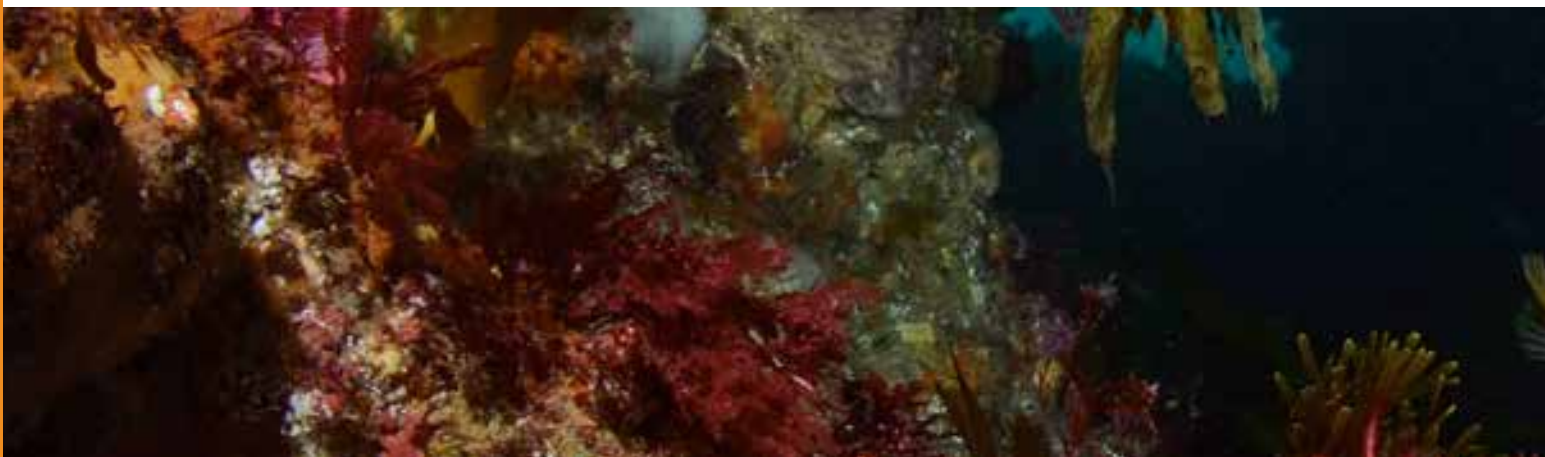
8. Question 16 related to the long-term maintenance and updating of the proposed Ocean Portal and the responses reflected the diversity of the respondents' backgrounds with no clear conclusion other than "not sure or no response". This reinforces the massive challenge that voluntary or not-for-profit environmental groups face today - how to secure on-going funding. Without this level of on-going funding any attempt to establish a comprehensive Ocean Literacy Portal would not be viable.

9. The responses to Question 17 provided two clear answers to the question "How do you envisage the Ocean Literacy Portal in helping you to deliver Ocean Literacy/Marine Education outcomes?" These two answers were "foster collaboration and links between organisations" and "establish an easily accessible information hub for a range of audiences". It's proposed that the Ocean Literacy Portal should focus on the development of these two elements - one section that fosters networking and collaboration and a second section that acts as an "information hub" that would ideally act as a "one-stop-shop" for marine educators aiming to include ocean themes in their programs. More commentary on the design of this second section of the Portal is outlined in response to Question 19.

10. Question 18 asked "what tools or resources would you like to see in a portal?" the answers were mixed with no one clear preference being articulated, which may be due to the diversity and activities of organisations surveyed.

When it comes to the provision of tools and resources, the proposed Ocean Literacy Portal simply cannot provide such a diverse range. However, following on from the proposal (above) that the Portal should focus on the development of two elements / section. Many of the tools and resources listed in Question 18 could be adapted to fit into either one of these two elements / sections.

One section would focus on delivering the directories listed under the Question18 dot points while the other could focus on delivering the curriculum related outcomes listed in the dot points.



11.

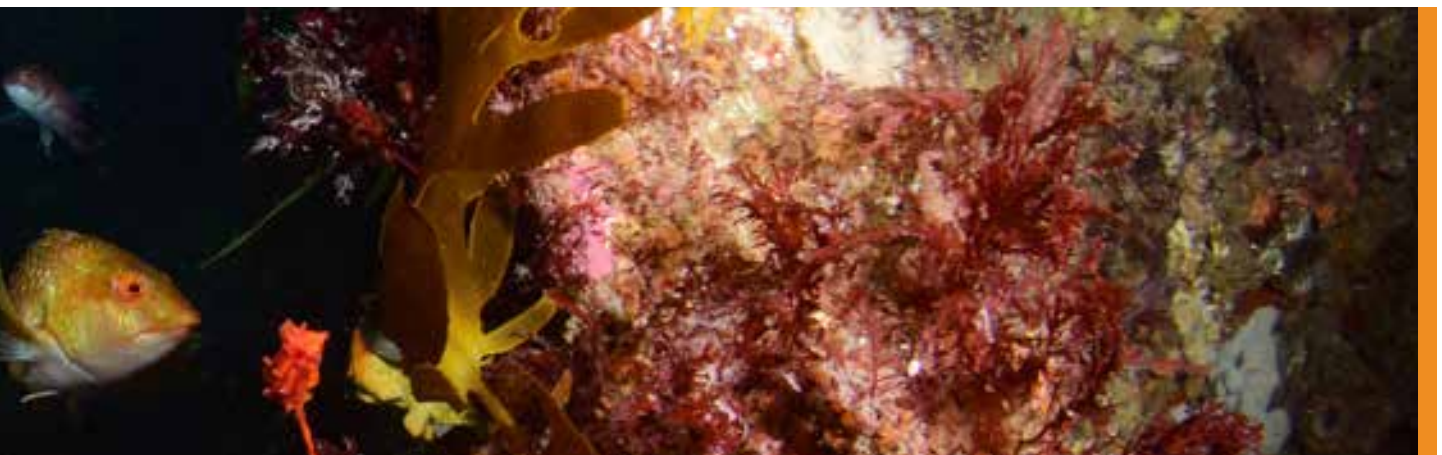
Question 19 was open ended, seeking further comments from respondents. The majority of respondents had no comment, however did take the time to say “thank you” to the organisers of the survey. The next most common response was “this won’t be an easy task” which isn’t surprising given past experiences in this space, especially in terms of obtaining secure on-going funding. Two key responses highlight the challenges.

“ As an academic I receive a lot of requests from individual schools to assist in delivering marine science in their classroom. As much as I would love to do this for all schools, I simply do not have the time in my role to do this. A one-stop-shop for all providers will allow me (and others) to redirect these requests to access information in one portal. To achieve all the above into one website will take considerable thought and time and should be a consultative process with the organisations involved.”

“The United Nations Decade of Ocean Science for Sustainable Development Framework for Action, uses Ocean Literacy in a much, much wider context than the way literacy is referred to in this survey.” (Note: The author of this comment is referring to the 2021 IOC UNESCO report entitled Ocean Literacy within the United Nations Decade of Ocean Science for Sustainable Development - A Framework for Action).

The first quotation very neatly defines the second of the two sections of the proposed Ocean Literacy Portal outlined under Questions 17 and 18 above. It also highlights the fact that this is no easy task and, as stated in Question 17, one other respondent also presented a similar belief. However simply because a project such as this is hard doesn’t mean it isn’t needed and shouldn’t be attempted.

The second quotation quite astutely refers to the UN Ocean Decade and the associated IOC UNESCO Ocean Literacy generated Framework for Action. The Australian and Pacific representative on the IOC UNESCO working group agreed that this document, along with another recently published IOC UNESCO document featuring the Blue Curriculum concept, should be used as a foundation for the development of the proposed Ocean Literacy Portal. It’s also important to highlight the excellent ocean literacy-based scope and sequence documents that USA based colleagues working with the National Marine Educators Association (NMEA) have produced. This NMEA publication and three IOC UNESCO publications are listed in the References.





■ Recommendations

To support the demand for positive ocean action and improve ocean literacy it's important to acknowledge the increasing time demands on educators in a crowded curriculum. Efforts also need to create easily accessible curriculum-aligned resources and provide professional development opportunities with sustained funding and support. To achieve this the following recommendations have been made.

■ **Victorian Ocean Literacy Reference Group**

Develop working group of industry experts, marine educators and Department of Education representatives to help guide the effectiveness and future ocean literacy efforts in the state. To coordinate and ensure the success and longevity of the group, funding needs to be secured to engage a suitable trained facilitator/project manager.

■ **A change in terminology**

- Adopt the more globally accepted and encompassing terminology 'ocean literacy', phasing out the use of 'marine education'.
- Include the term 'Great Southern Reef' for Victorian and temperate references to the southern marine environment to ensure it becomes a part of everyone's vocabulary like the 'Great Barrier Reef'.

■ **Ocean literacy Resources**

- Review existing resources for suitability and develop new ones to fill gaps.
- Resources need to be contemporary, scientifically robust, easily accessible, embed ocean literacy principles, align with the curriculum and provide background information for educators to use confidently
- Cater for and include indigenous and non-English speaking communities.
- Include international resources where relevant.

■ **Professional Development**

- Resources must be supported with “pre-service and professional development programs” to empower and give teachers the confidence to teach ocean literacy.
- Embed ocean literacy principles into programming.

■ **Ocean Literacy Portal**

Build on the existing OceansIQ website to create an easily accessible and centralized website portal that features:

- A reference group that fosters networking and collaboration.
- A section that acts as an “information hub” that would ideally act as a “one-stop-shop” for marine educators aiming to include ocean themes in their programs.
- Resources that align with the national curriculum.
- An interactive map of education providers.

■ **Long term funding**

- Significant and sustained funding is essential to ensure consistency of delivery, contemporary resources and support for educators for any ocean literacy efforts to be successful.
- Recommend a funding strategy mix of seed state government support and philanthropic funding.

■ **State Government Support**

- Securing state government support is imperative to ensure sustained and strategic ocean literacy efforts are incorporated and supported in the curriculum. It is an innovative opportunity for the Victorian Government to lead the way, nationally and internationally, towards a healthy future through the development of a prototype model that can be replicated in each state.
- Development of a briefing paper to the Education Minister and business case for long-term funding support.

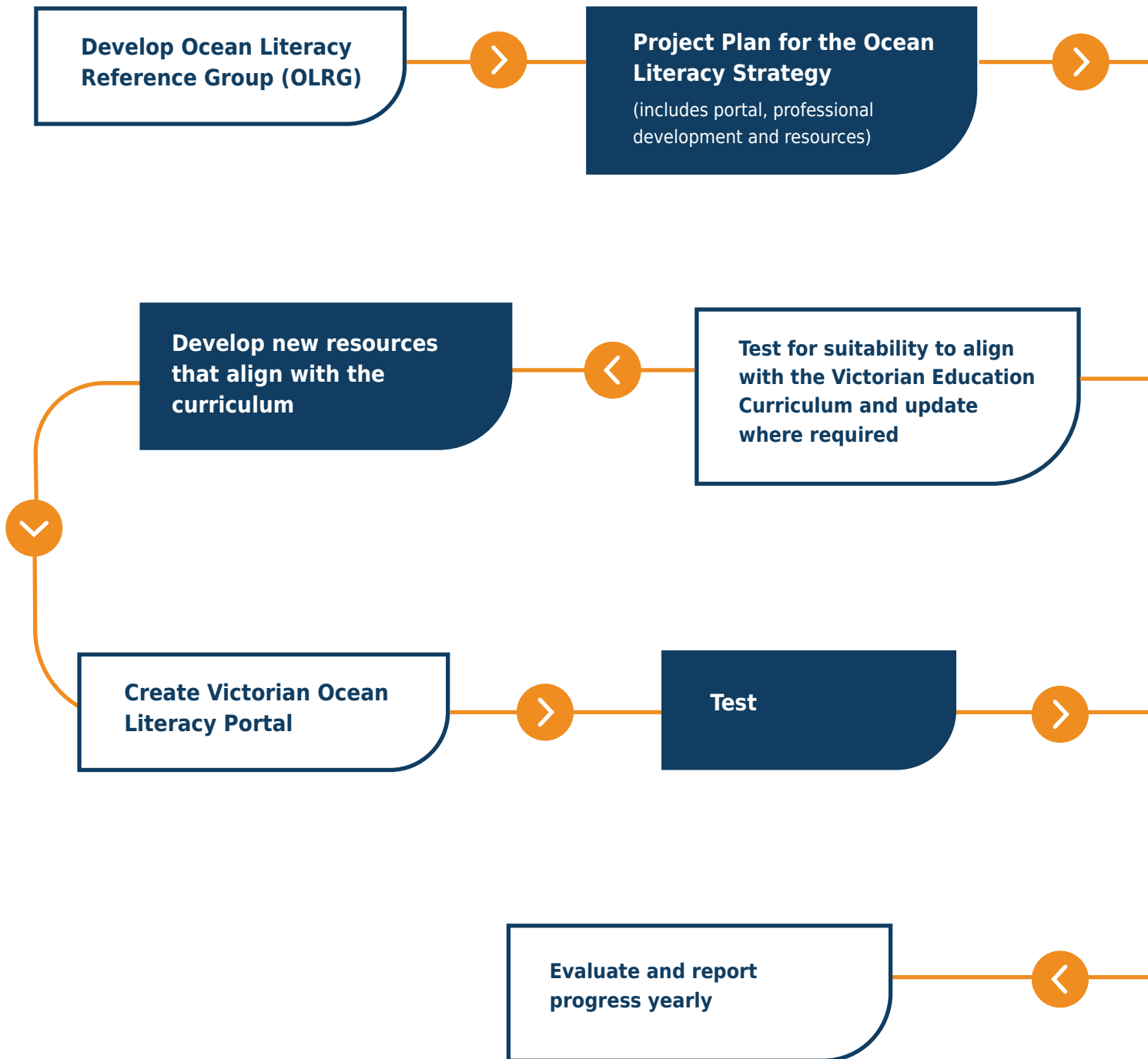
■ **Partnerships**

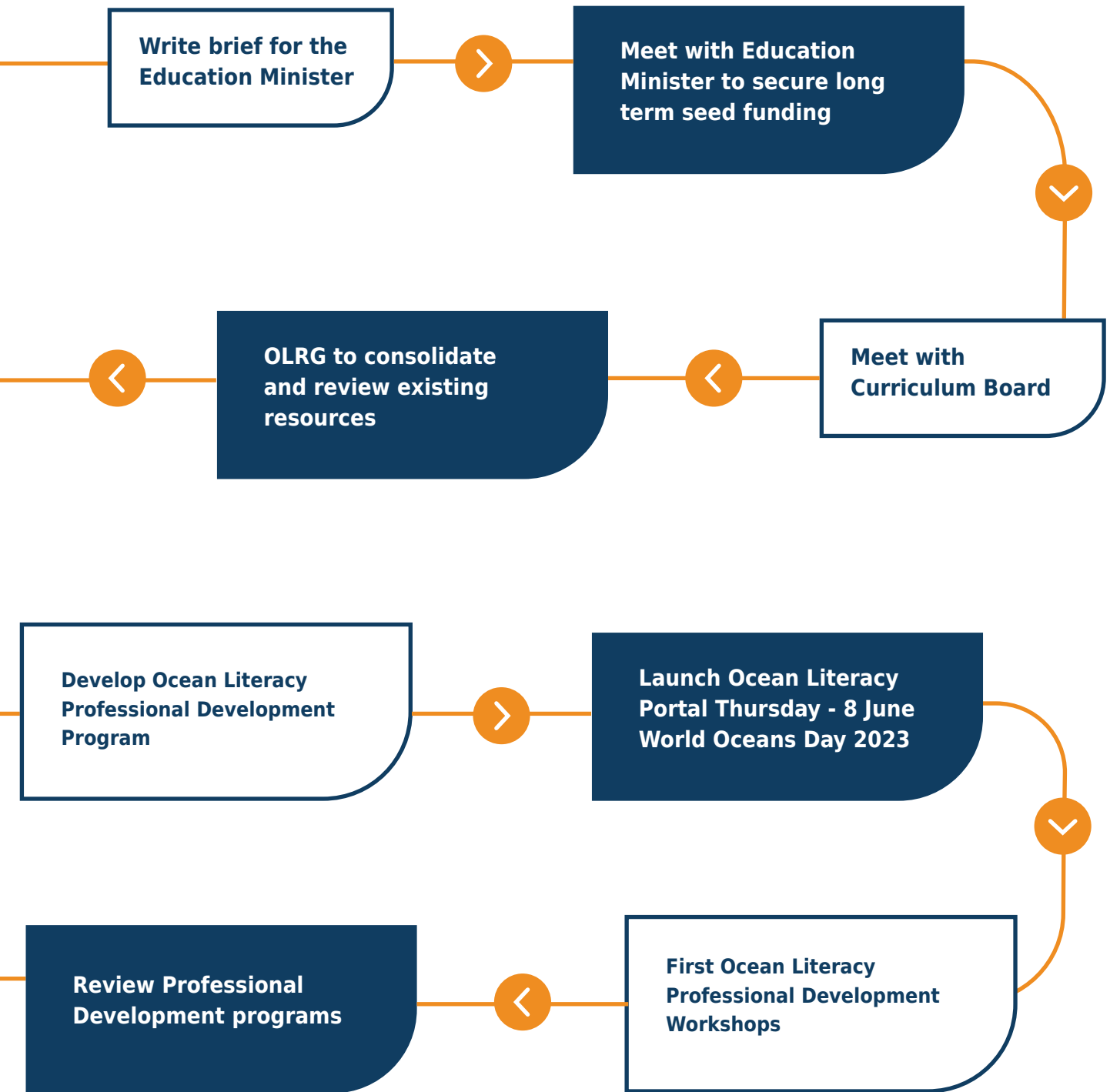
- Engagement and collaboration with Indigenous and non-English speaking communities.
- Nurturing and working with national and international projects partners e.g. NMEA to develop scope and sequence guidelines for Australia.

■ **Research**

- Further research into increased literacy and impacts on behaviour change.
- Explore funding avenues and partnerships with Deakin University and other key stakeholders. Recommend research and evaluation be undertaken once the portal, resources and professional development programs have been developed and rolled out.

Victorian Ocean Literacy Roadmap





■ Appendix 1. Survey Participants

Ocean literacy/Marine education tools
Australian Association of Environmental Educators (multiple submissions)
Bayside City Council
Bellarine Catchment Network
Cool Australia
Deakin University
Dolphin Research Institute
Dromana Primary School
Friends of The Bluff Community Group
Gould League
Jawbone Marine Sanctuary Care Group
Jody Plecas
Lakes Explorer
Marine Mammal Foundation
Marine and Freshwater Discovery Centre/ Victorian Fisheries Authority
Melbourne Girls' College
Melbourne Polytechnic (Jawbone Marine Sanctuary Care Group)
MESAC
Monash University
Mornington Peninsula Shire
Nautilus Educational
Ocean Tidings
Port Phillip EcoCentre
Saltwater Projects
Scout Scuba Victoria
Sealife Melbourne Aquarium
Sheree Marris
Southern Ocean Education
Thornbill Eco Education
Victorian National Parks Association
Waratah Beach Camp

■ References

- Gough A, 2017. Educating for the marine environment: Challenges for schools and scientists. Marine Pollution Bulletin (2017).
- NMEA, 2022. A Handbook for Increasing Ocean Literacy - Tools for Educators and Ocean Literacy Advisors.
- IOC UNESCO, 2017. Ocean Literacy for All - A toolkit.
- IOC UNESCO, 2021. Ocean Literacy within the United Nations Decade of Ocean Science for Sustainable Development - A Framework for Action.
- IOC UNESCO, 2022. A New Blue Curriculum - A toolkit for policy-makers.



OceansIQ Ocean Literacy Survey Report 2022
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