



**Mass Coral Bleaching
and
Maintaining Optimal Reef Conditions**

Hobart Zoo and Aquarium - 2026

Hobart Zoo and Aquarium

Stuart Webster has been enchanted by animals and zoos since a young age. Growing up with limited means, he found immense joy wandering Melbourne Zoo alone, promising himself that one day he would own one. That promise became his lifelong mission — pursuing the dream through keeping animals and travelling the world to study hundreds of zoos.

His journey was far from simple. After leaving school early and facing addiction and personal hardship, he rebuilt his life, found stability, and created the financial footing that eventually allowed him to buy the dream.



In 2024, Webster purchased Zoodoo Zoo in Tasmania and rebranded it as Hobart Zoo & Aquarium. He has since launched major upgrades, from new exhibits and an aquarium with future plans for accommodation beside the lion habitat and plans for future species including red pandas, otters, cheetahs and eventually gorillas.

Stuart reinvests everything into creating a world-class, welcoming zoo with a team that share his fierce passion for animal conservation and education. He is finally living the dream he held onto for 50 years!

HZAA Owner Stuart Webster





Six Pillars of Conservation at Hobart Zoo and Aquarium



Pillar One

Supporting ex-situ animal populations



Pillar Two

Educate and inspiring positive change for wildlife



Pillar Three

Protecting wild species and habitats



Pillar Four

Enhancing the value of zoos for nature and society



Pillar Five

Sustaining and caring for our local ecosystems



Pillar Six

Maintaining environmental sustainability



Learning Intentions

- Define what a coral is.
- Draw and label a scientific diagram of a coral polyp.
- Understand coral symbiosis with zooxanthellae.
- Map where coral is predominantly found in Australia.

Success Criteria

Create a mind map with a labelled scientific diagram to explain:

- what coral is
- why corals form a symbiotic relationship with zooxanthellae
- where coral reefs can be found in Australia

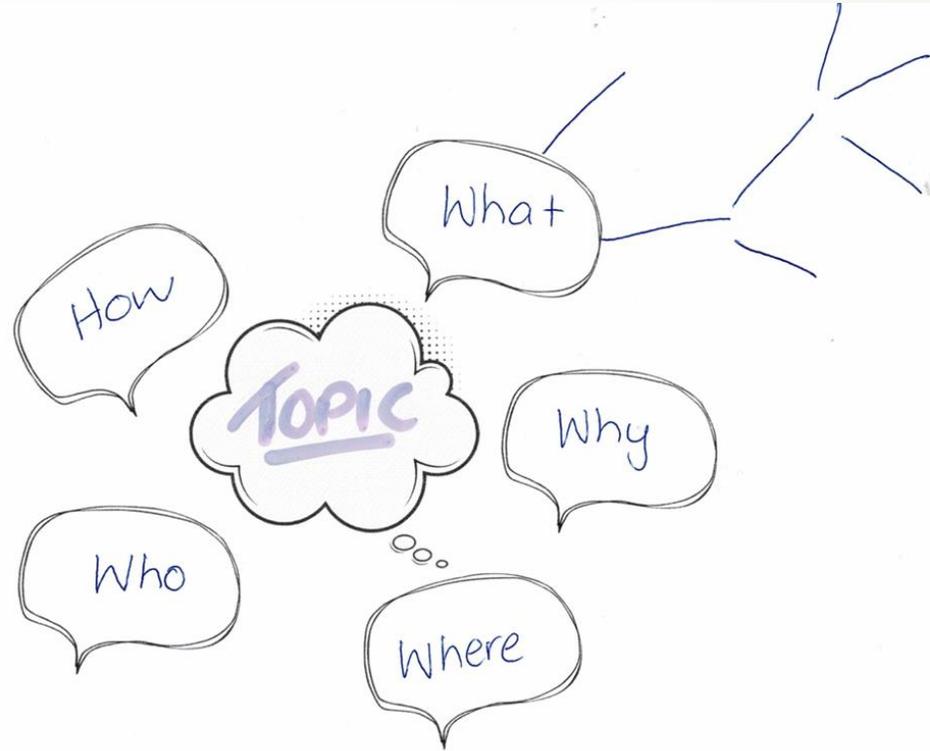
Include Scientific vocabulary and examples.



MIND MAPS

Place the main topic in the center and draw branches connecting key ideas, subtopics, and details.

HOW TO TAKE NOTES



- Facts
- Drawings
- Figures
- Vocabulary
- Keep it short!



What is coral?



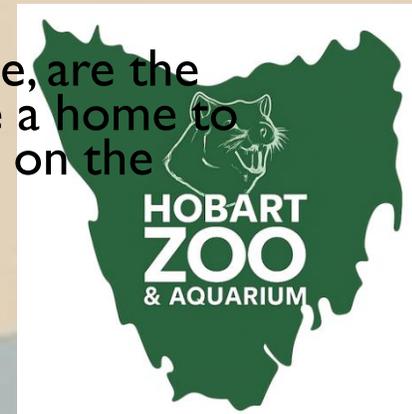
Corals may look like colourful rocks or plants, but they are animals that form colonies of identical polyps.

Fully grown, individual polyps can range from a few millimetres to a few centimetres in diameter. Corals grow by asexually reproducing polyps, which means a polyp will 'bud' and form another polyp, which is an exact replica of itself. This process grows the coral into what is known as a colony. Some colonies, especially smooth rounded coral of the *Porites* genus, can grow several meters in height.

These animals, while seemingly simple, are the builders of coral reefs which provide a home to over a quarter of the marine species on the planet.

AIMS - 2026

Hobart Zoo and Aquarium - 2026



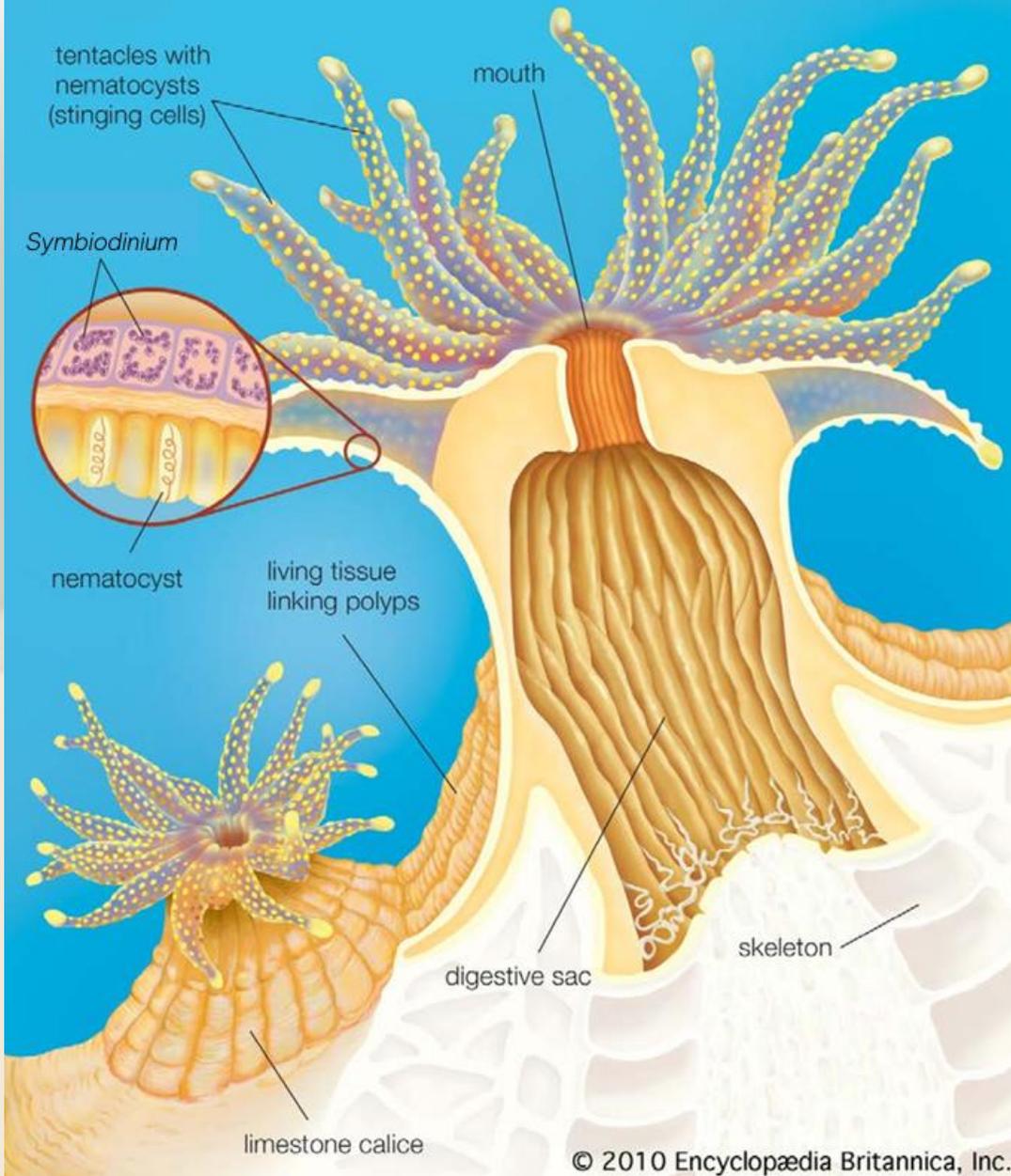
What is a coral polyp?

The **polyp** is the basic living unit of Anthozoa (further subdivided into subclass Hexacorallia, which includes stony corals, and subclass Octocorallia, which includes soft corals). Polyps can occur either singularly, as in the case of anemones and some stony corals, or can form colonies, as they do in most stony and all soft corals. A key feature of Cnidaria is the presence of **cnidocytes**, or stinging cells, which the polyp uses for prey capture and defense. They range from 1mm to 10mm in size.

Coral Polyp Anatomy - Coral Disease & Health Consortium



Anatomy of a Coral Polyp



© 2010 Encyclopædia Britannica, Inc.

Anatomy of a Coral Polyp

Cross-section-coral-polyp.jpg <https://cdn.britannica.com/94/26994-050-D4199B8F/Cross-section-coral-polyp.jpg?w=300> (300×363)

Your task:

Draw and label a scientific diagram of a polyp that includes measurement ranges.

Write a summary to explain what a coral polyp is.



How does coral get it's colour?

Corals range in colour from red to purple and even blue, but are most commonly shades of brown and green.

They get their colours from the millions of microscopic algae that grow in the coral polyp's called zooxanthellae which has a symbiotic relationship with their host coral. The host coral provides a home for the algae, protecting them from the elements and supplying the necessary components for photosynthesis.

Zooxanthellae have a pigment called chlorophyll. This pigment can be yellow, green, or brown. When exposed to sunlight, chlorophyll helps convert carbon dioxide and water into a type of sugar called glucose, which provides energy for both the zooxanthellae and the coral.

The amount of zooxanthellae in the coral tissue largely decides the colour of the coral.

Corals also make other pigments that help shield them from too much sunlight.

[Coral and coral cover | Reef Authority](https://www2.gbrmpa.gov.au/learn/coral) - <https://www2.gbrmpa.gov.au/learn/coral>



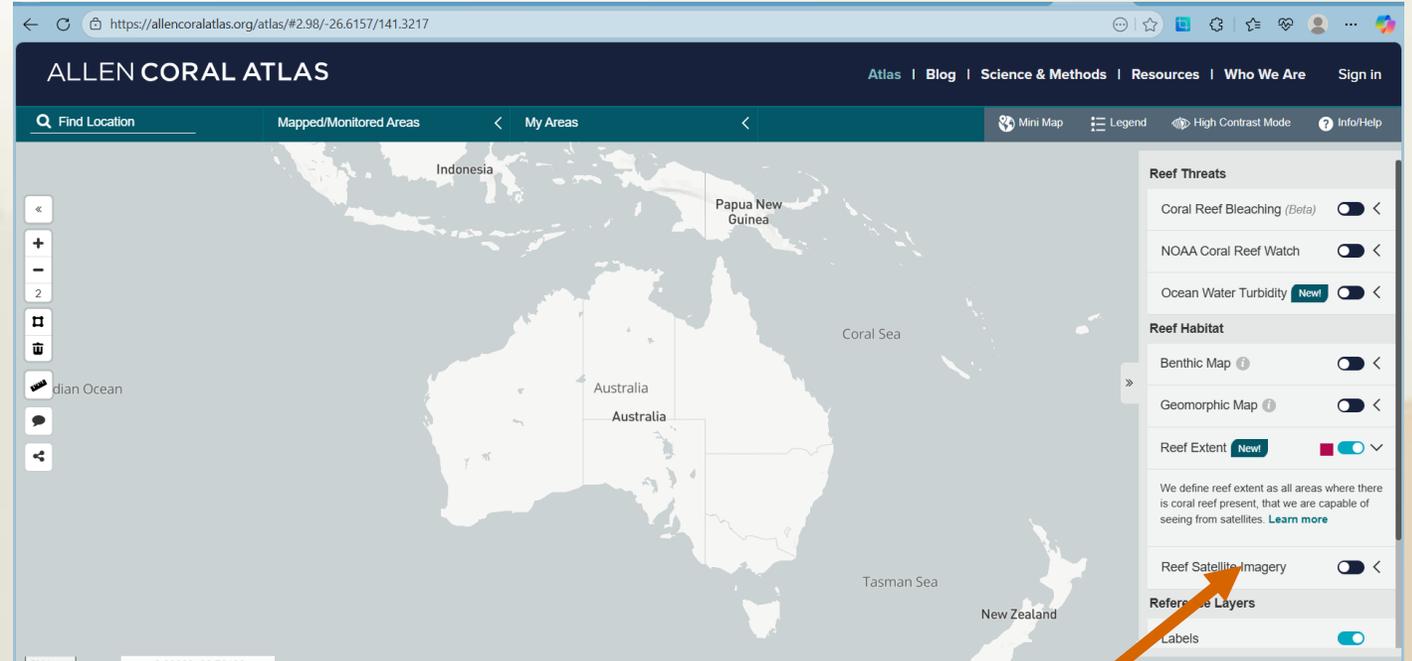
Where is coral predominantly found in Australia?

allencoralatlas.org

Head to the online map, Allen Coral Atlas, and investigate where coral is found throughout Australia.

Record your findings on your ideas map.

The Allen Coral Atlas, powered by Arizona State University, maps the world's coral reefs and monitors their threats to provide actionable data and a shared understanding of coastal ecosystems.



Ensure that you zoom in and only have the *reef extent* filter turned on.

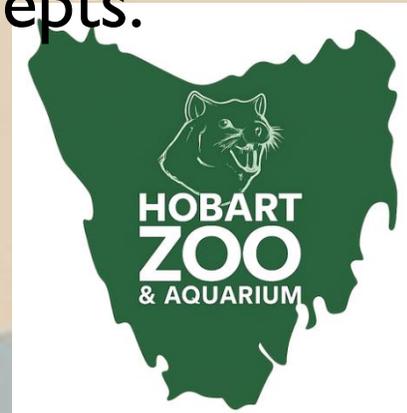


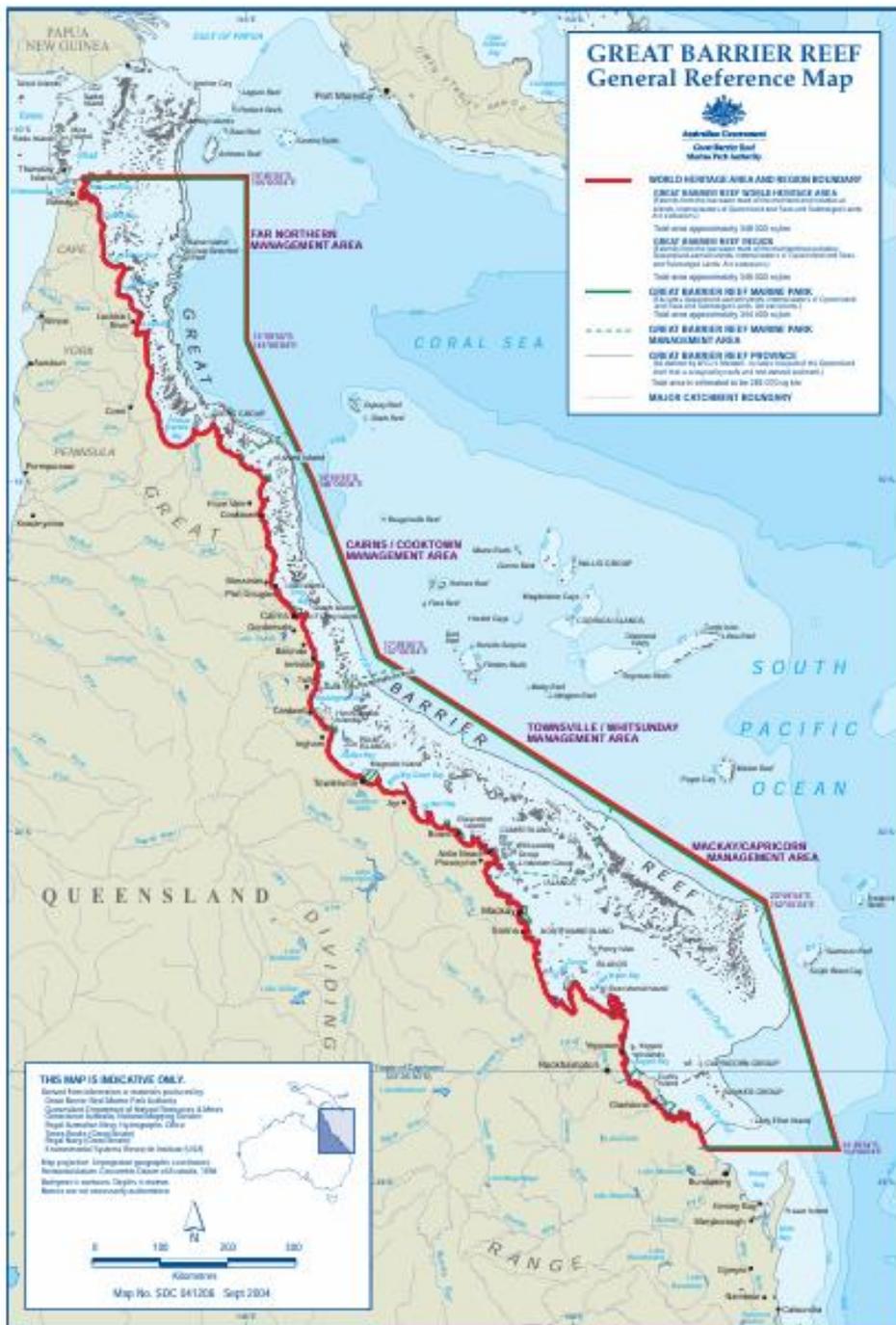
Learning Intentions

- Classify the two groups of coral species found on the Great Barrier Reef.
- Understand how the Australian Government measure the health of coral reefs.
- Explain Shelford's Law of Tolerance and how it is used in Marine Biology.

Success Criteria

- Provide detailed written responses with evidence from your learnings to answer 4 questions to check for understanding of key concepts.





What do we know about the Great Barrier Reef conditions?



What do we know about the Great Barrier Reef conditions?



	Water	Weather
Port Douglas	29.6°C	28°C ☁️☀️
Cow Bay	29.6°C	28°C ☁️☀️
Cairns	29.5°C	28°C ☁️☀️



warm temperature



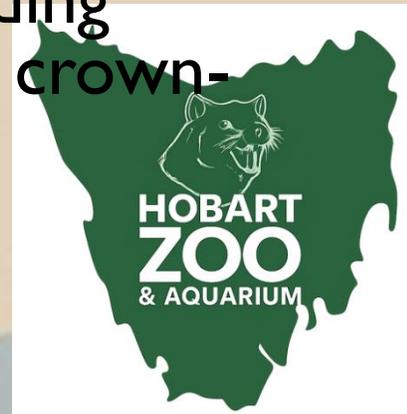
Where is coral predominantly found in Australia?

“The Great Barrier Reef is a rich and complex natural ecosystem. It is the largest coral system on the planet, with almost 3,000 individual reefs covering an area of 344,400 square kilometres – approximately the size of Germany.

Not only is the Reef an ecosystem of extraordinary natural beauty, it also contributes \$6.4 billion each year to the Australian economy, and supports 64,000 jobs.

The Reef is subject to significant environmental pressures, including marine heatwaves associated with climate change, cyclones, and crown-of-thorns starfish outbreaks.”

Accessed on the 2nd February 2026 from [Monitoring the Great Barrier Reef | AIMS](#)



Types of Coral

LARGE LEATHER CORAL

SARCOPHYTON



DID YOU KNOW?

Large leather corals have a soft, leathery surface that secretes protective mucus, helping them fend off predators like butterflyfish and nudibranchs!

RANGE & HABITAT

Found in the Indo-Pacific and Red Sea regions, often on shallow reef slopes and lagoons. Prefers areas with moderate water flow.

DIET

Primarily photosynthetic, relying on symbiotic zooxanthellae algae in their tissues for energy, but they can also capture tiny plankton with their polyps.

PREDATORS

- Butterflyfish
- Some angelfish species
- Nudibranchs (sea slugs)
- Certain parrotfish

EXTINCT – EXTINCT IN THE WILD – CRITICALLY ENDANGERED – ENDANGERED – VULNERABLE – NEAR THREATENED – LEAST CONCERN

There are around 450 species of hard corals on the Great Barrier Reef and more than a thousand species of soft corals. There are two main types of corals - hard and soft.

“Soft corals have soft bodies that can move and flow with the ocean currents. When you look at them, soft corals resemble plants or trees with limbs blowing in the wind whereas hard corals resemble rocks.

Soft corals do not have hard calcium carbonate

skeletons like hard corals do. As a result, they do not build into reefs. Instead, they grow like trees and have a wood-like core and a soft exterior for protection.”

- Hard Coral - Ocean Conservancy



Types of Coral

Hard corals are known for being the building blocks of colorful reefs in tropical waters around the world. **Hard corals are soft-bodied but secrete limestone skeletons for support.**

Coral reefs are formed when many polyps come together and build on one another. The result is a colony of polyps that act as one organism. Then, many colonies of different types of coral make up the coral reefs we know and love.



Staghorn Coral

What is the make up of coral reefs?

A coral reef is made up of three main components:

A hard surface

Submerged rocks or other hard surfaces provide a place for corals to attach and serve as habitat for many coral reef animals.

Coral polyps

Coral polyps are tiny little animals and are related to anemones and jellyfish. They can live individually, or in large colonies that comprise a coral reef.

Reef animals

Millions of species are associated with coral reef ecosystems, and many play crucial roles in maintaining a healthy, functioning, and balanced reef.





What does 'percentage hard coral cover' mean?

There are many ways to measure the status of coral reefs. One of the most common is to use percentage hard coral cover as an indicator of reef condition because it describes the abundance of a critical ecosystem engineer on coral reefs. This measure describes the proportion of the seafloor that is covered in live hard coral. Percentage hard coral cover is used by scientists worldwide and is a standard measure that applies to all locations. While it does not tell us anything about the diversity or composition of coral assemblages, it provides a simple and robust measure of reef health.

Percentage hard coral cover can be estimated using various techniques. The technique used for this report is [manta tow surveys](#), which are visual estimates of percentage hard coral cover over the area covered by an observer during one two minute tow (~2000m²). The percentage hard coral cover for a reef is then estimated as the average of the estimates from all tows around a reef and reported as broad categories (e.g. 0% - >0% - 10%, >10% - 30%, >30% - 50%, >50% - 75% and >75% - 100%; Image 4).

A coral reef consists of more than just hard coral and contains a diverse array of other corals, sponges, algae, sand, rock and invertebrates. It is relatively rare for GBR reefs to have 75% - 100% hard coral cover, and AIMS defines >30% - 50% hard coral cover as a high value, based on historical surveys across the GBR.

[Other techniques](#) for determining percentage hard coral cover involve counting the number of points within sampling units (quadrats and photos), as used by the LTMP during fixed-site surveys, or the linear distance along a tape measure (line-intercept) that intersect live hard coral colonies. Adding up the total number of points of live hard coral cover and then expressing this as a percentage of the total number of points within a sample yields the estimates of hard coral cover. Data from both the fixed-site and manta tow surveys conducted by the LTMP are highly correlated and show the same trends in hard coral cover estimates. However, manta tow estimates are commonly lower than those obtained from fixed-site surveys as they encompass the entire reef, including sandy back reef habitats that generally have low coral cover.

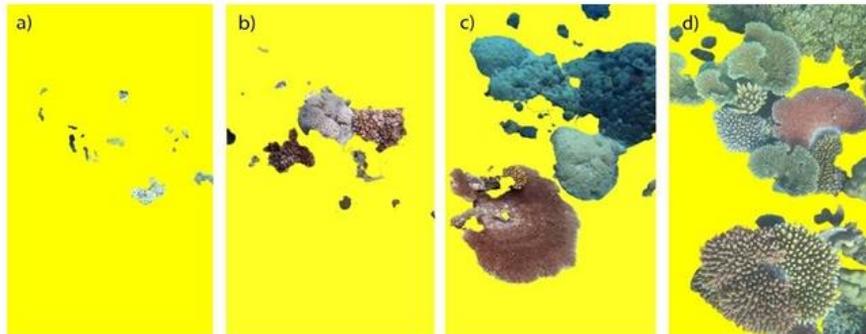


Image 4: Examples of categories of percent hard coral cover a) >0% - 10%, b) >10% - 30%, c) >30% - 50% and d) >50% - 75%. The yellow areas show non-hard coral reef surfaces, and the categorisation is based on the proportion of the substrate covered in live hard coral colonies.

Reading

This text explains how the Australian Government measure the health of coral reef.



Check for Understanding- Written Response

Question 1 –

Write a paragraph to **describe** the difference between hard corals and soft corals and **explain** how these differences affect their roles in reef formation.

Question 2 –

Draw a diagram and explain the structure of a coral reef.

Question 3 –

How do AIMs Scientists measure the health of coral reefs?

15 minutes



Shelford's Law of Tolerance

Developed by American zoologist and a founder of studying ecology, Victor Ernest Shelford in 1911. He was one of the first scientists to study natural environments as a whole ecosystem, community of complex relationships among plants and animals.

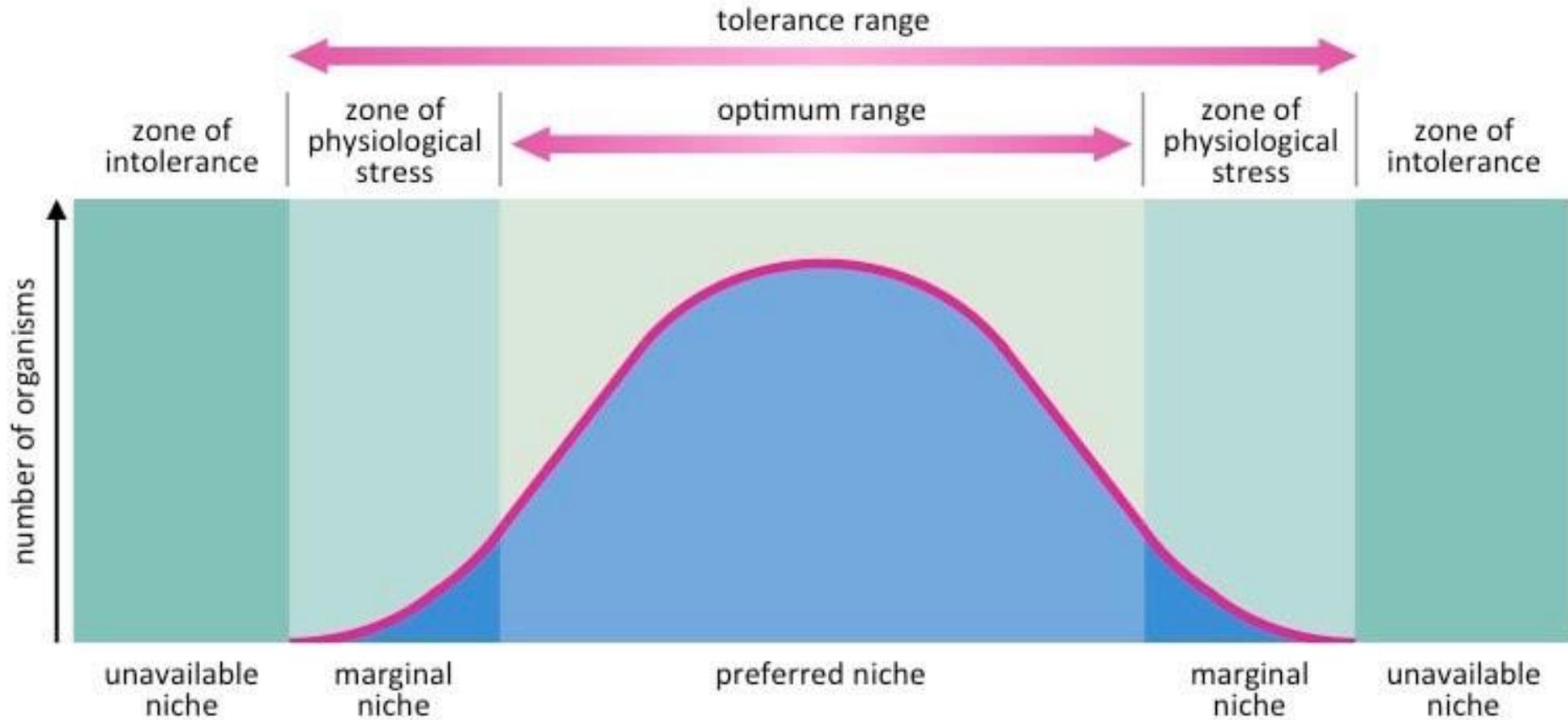
Definition

noun

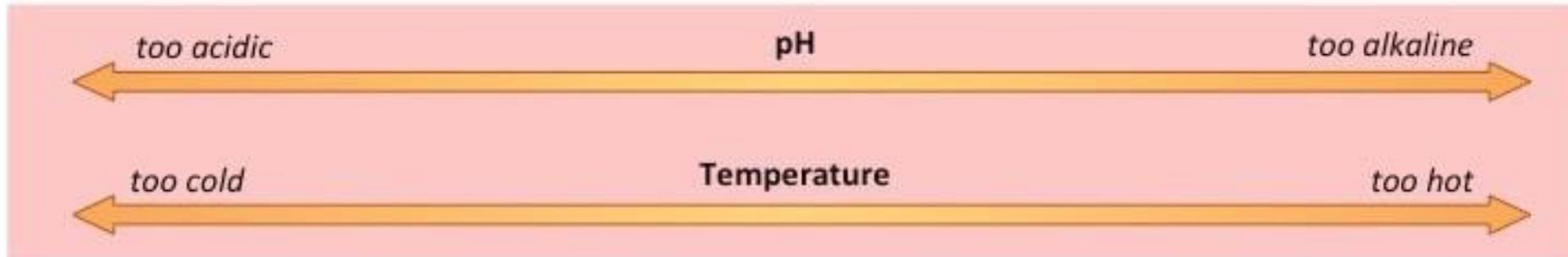
It is a law stating that a certain organism's survival and existence depend upon the multifaceted set of conditions wherein each individual has definite minimum, maximum and optimum ecological factors to establish success.



Range of Tolerance



Examples



Check for Understanding- Written Response

Shelford's Law of Tolerance

Question 1

How could changes in environmental conditions—such as bleaching events, temperature shifts, or storms—affect the tolerance limits of coral and marine species?

Question 2

What considerations do aquarists need to make when setting up and monitoring aquarium environments? How do they achieve this?

15 minutes



Excursion to Hobart Zoo and Aquarium

Learning Intentions

- Explain and understand the nitrate cycle.
- Investigate the chemical levels for optimal conditions in tropical saltwater ecosystems and aquariums.
- Understand the purpose of recreating tropical reef ecosystems in modern aquariums.

Success Criteria

- A written response of two paragraphs to explain the purpose of modern aquariums and the relationship between the nitrogen cycle and Shelford's Law of Tolerance.



Purpose of Re-creating Tropical Saltwater Ecosystems in Aquariums

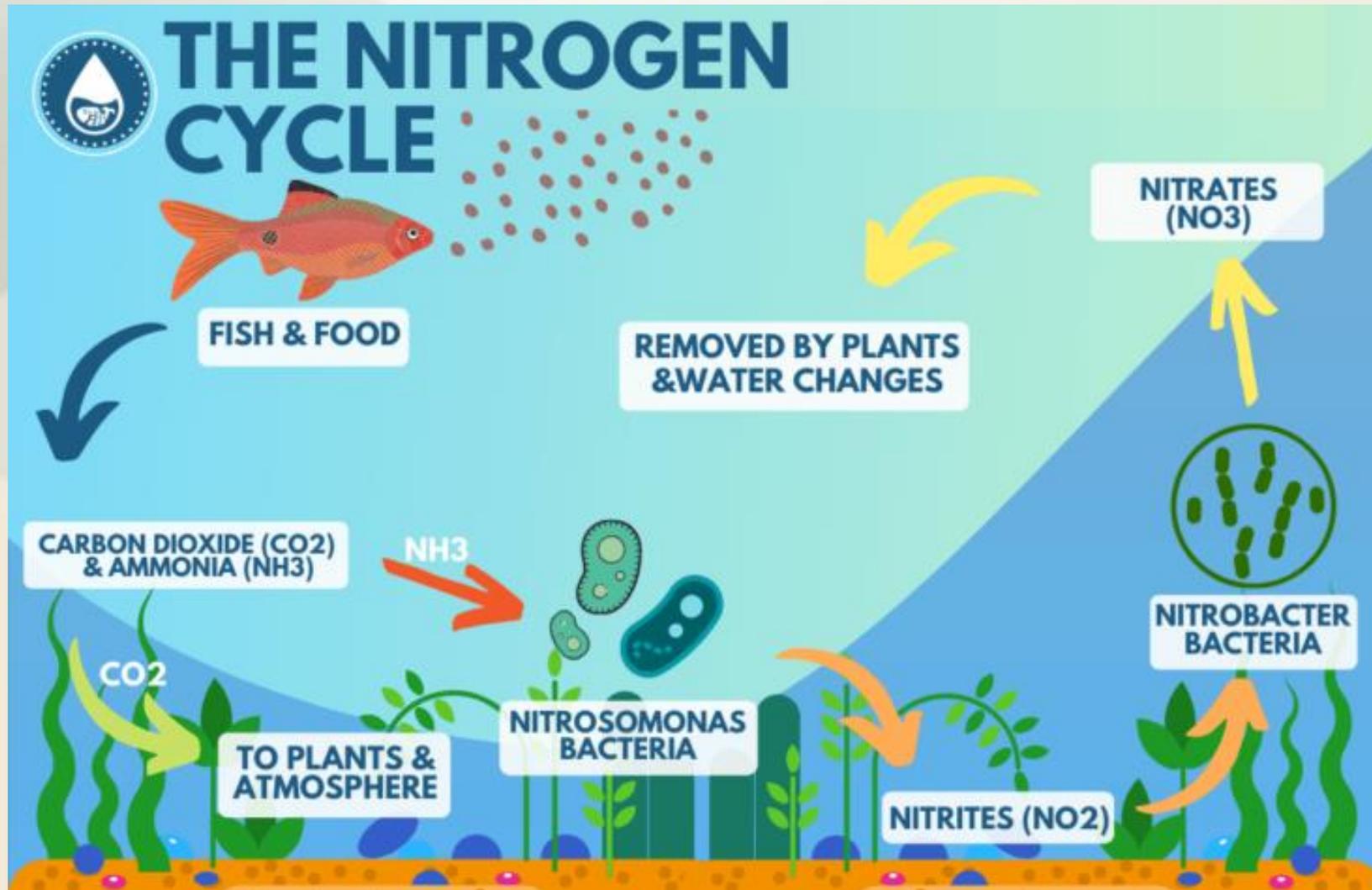
This provides an important platform for public education and conservation engagement by allowing people to observe the dynamics of marine systems firsthand.

AIMS emphasises that understanding tropical marine ecosystems is essential for sustainable ocean management, and aquariums help communicate this science through accessible, immersive learning experiences.

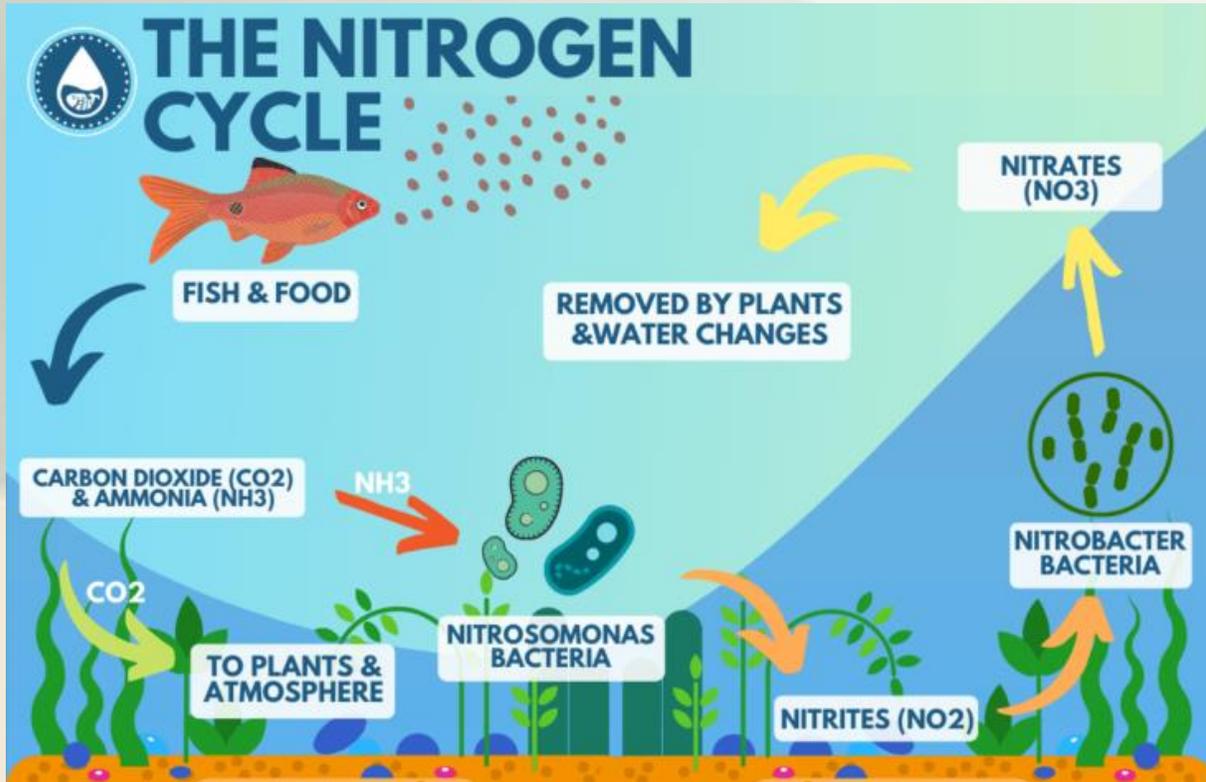
As aquariums replicate these environments, maintaining optimal chemical parameters and supporting a healthy nitrogen cycle becomes essential, providing a natural transition into understanding water quality management and the nitrate cycle as the next key topic.



The Nitrogen Cycle



The Nitrogen Cycle



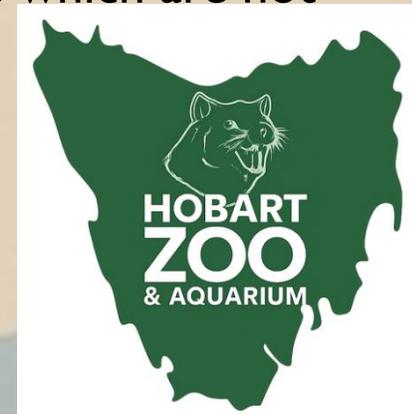
Aquariums are a closed system in which debris, such as uneaten food, dead plants/animals and waste material accumulates, leading to the build-up of toxic compounds such as nitrites.

This phenomenon is referred to as the 'Nitrogen Cycle'.

In order to stop the accumulation of toxins such as ammonia - which can kill aquatic species - it is important to keep the levels of these harmful by-products as low as possible.

Within the tank there will be a population of 'good' bacteria called nitrifying bacteria.

These bacteria typically live in the filter or substrate and convert the very toxic ammonia into less toxic nitrites then eventually into nitrates which are not harmful to the animals.



Chemical Parameters for Optimal Conditions in Tropical Reef Aquariums

Parameters Critical to Control in Reef Aquaria

Parameter	Reef Aquaria Recommendation	Typical Surface Ocean Value
Ca Calcium	380 - 450 ppm	420 ppm
A_T Alkalinity	2.86 - 4.29 meq/L 142 - 215 ppm CaCO ₃ equivalents 8 - 12 dKH	2.5 meq/L 125 ppm CaCO ₃ equivalents 7 dKH
Salinity	32 - 35 ppm *As low as 1.019 for fish only tanks. sg = 1.023 - 1.026*	34 - 36 ppm sg = 1.025 - 1.027
Temperature	78 - 80° F is optimal* *Can be 76 - 82° F if kept stable.	Variable
pH pH	7.8 - 8.5 OK 8.1 - 8.3 is better	8.1 - 8.3 *Can be higher or lower in lagoons.
Mg Magnesium	1200 - 1400 ppm	1280 ppm
PO₄ Phosphate	< 0.03 ppm	0.005 ppm
NH₃ Ammonia	0 ppm	Variable typically < 0.1 ppm

Refer to reading for further details.



Check for Understanding- Written Response

- A written response of two paragraphs to explain:
 - the purpose of modern aquariums
 - the relationship between the nitrogen cycle and Shelford's Law of Tolerance.



Excursion to Hobart Zoo and Aquarium

Learning Intentions

- Explain what considerations aquarist and marine biologists need to make when setting up ecosystems in tanks.
- Learn how to test to ensure optimal conditions are met and how to make adjustments according to Shelford's Law of Tolerance.
- Understand how experts choose marine species to coinhabit tanks to mimic wild ecosystems.

Success Criteria

- Attend excursion to Hobart Zoo and Aquarium to learn and practice how to ensure that the coral and marine species can thrive in simulated tank ecosystems.
- Use tools to measure pH, KH, salinity, calcium, temperature, ammonia, nitrite and nitrate.



Learning Intentions

- Understand recent mass coral bleaching events on the Great Barrier Reef.
- Discuss the impact of mass coral bleaching events on the overall health of the GBR.
- Describe the cause of these events.
- Communicate the role that modern Aquariums such as Hobart Zoo and Aquarium have in raising awareness of the situation on the GBR.

Success Criteria

Create a single A4 infographic with scientific graphs, photos to explain the current effects of Mass Bleaching events on the GBR. Ensure you include information to answer the following:

- What the 2024 bleaching event was.
- Why corals are sensitive to heat.
- What the data tells us.
- How individuals or communities can support reef resilience.



AIMS LONG-TERM MONITORING PROGRAM

GREAT BARRIER REEF ANNUAL SUMMARY REPORT

CORAL REEF CONDITION 2024 - 2025



Total number of reefs surveyed **124**



LEGEND

HARD CORAL COVER: ■ >0% - 10% ■ >10% - 30% ■ >30% - 50% ■ >50% - 75% ■ >75% - 100%

CROWN-OF-THORNS (COTS): No COTS 0 No Outbreak >0 - 0.1 COTS Potential Outbreak >0.1 - 0.22 COTS Established Outbreak >0.22 - 1 COTS Severe Outbreak Over 1 COTS (Number of COTS divided by tow numbers)

BLEACHING PREVALENCE: None 0 colonies bleached Low >0% - 10% colonies bleached Medium >10% - 30% colonies bleached High >30% - 60% colonies bleached Very high >60% - 90% colonies bleached Extremely high >90% colonies bleached



DHW Scale

The Degree Heating Week (DHW) scale measures accumulated heat stress on corals over a 12-week period, indicating the risk of coral bleaching and mortality.

The DHW is a metric used to assess the heat stress experienced by species on coral reefs. It quantifies the accumulated heat above a defined bleaching threshold. This is typically set at 1°C above the maximum monthly mean sea surface temperature.

National Oceanic and Atmospheric Administration



In the austral summer of 2023–2024, the GBR experienced its fifth mass coral bleaching event since 2016, part of the fourth global mass coral bleaching event. The GBR experienced unprecedented levels of heat stress, which caused the most spatially extensive and severe bleaching recorded to date (Figures 5 and 6).

DHW is a measure of heat stress on corals, combining the intensity and duration of sea temperatures that exceed 1°C above the seasonal maximum. Coral bleaching typically begins around 4 DHW, while 8 DHW and above is associated with widespread bleaching and significant coral mortality. In this report, we utilise DHW data from the NOAA from 2024, aerial bleaching surveys conducted in March 2024, manta tow surveys from the LTMP 2023, 2024, and 2025 field seasons and targeted in-water bleaching surveys at both peak heat and 9 to 12 months later. We present the extent, severity and impacts on hard coral cover of the bleaching event.

Aerial bleaching surveys: Aerial surveys confirmed that the 2024 bleaching event had the largest spatial extent and highest levels of heat stress exposure ever recorded on the GBR, with high to extreme bleaching prevalence observed across all three regions of the GBR. Of the reefs surveyed, 49% exhibited high bleaching (>30% of corals bleached), and 32% showed very high to extreme bleaching (>60%; Image 6).

In the Northern GBR, heat stress accumulation ranged from 1.84 to 9.7 DHWs between January and March 2024. Inner and mid-shelf reefs between Lizard Island and Cape Sidmouth were most affected, experiencing the highest DHW values and the most severe bleaching (Figure 5). This region was the most variable with 27.6% of reefs experiencing no bleaching, 33% had low levels, and 39.4% had high to extreme bleaching. The reefs that had no bleaching were generally in the far north or on the outer shelf.

In the Central GBR, reefs received between 2.4 and 11.4 DHWs, with peak heat stress around Cairns (5.1–9.5 DHWs), the Palm Island Group (5.2–9.5 DHWs), and the Whitsundays (5.2–11.4 DHWs; Figure 5). Across this region, 8.1% of reefs had no or low bleaching (<10% of corals bleached), 15.8% had medium bleaching (>10%–30%), and 76.1% had high to very high bleaching (>30%).

The Southern GBR experienced the highest heat stress on record for the GBR, with DHWs peaking at 15.6 in some areas. Reefs around the Keppel Islands (11.4–13.3 DHWs), Gladstone (15.3–15.6 DHWs), Capricorn-Bunker (10.9–11.7 DHWs), and Swain sectors (7.3–9.9 DHWs) were all severely affected (Figure 5). All aerial survey reefs in the Keppel Islands area and Capricorn-Bunker sectors had >30% bleaching, and 91% of Swain reefs exhibited high to extreme bleaching.

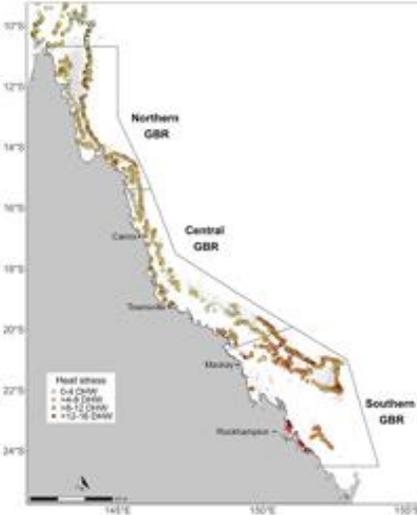


Figure 5: Accumulated heat stress of aerial survey reefs March 2024. Heat stress categories match NOAA bleaching warning categories: 0–4 DHW = Warning; >4–8 = Alert 1; >8–12 Alert 2; >12–16 Alert 3.



Image 4: Very high and extreme coral bleaching at North Keppel Island Southern GBR (top image) and extreme bleaching and early coral mortality at One Tree Island (bottom image) in March 2024.

Reading

This text explains the current health of the Great Barrier Reef and the most recent Mass Coral Bleaching Events.



Infographic

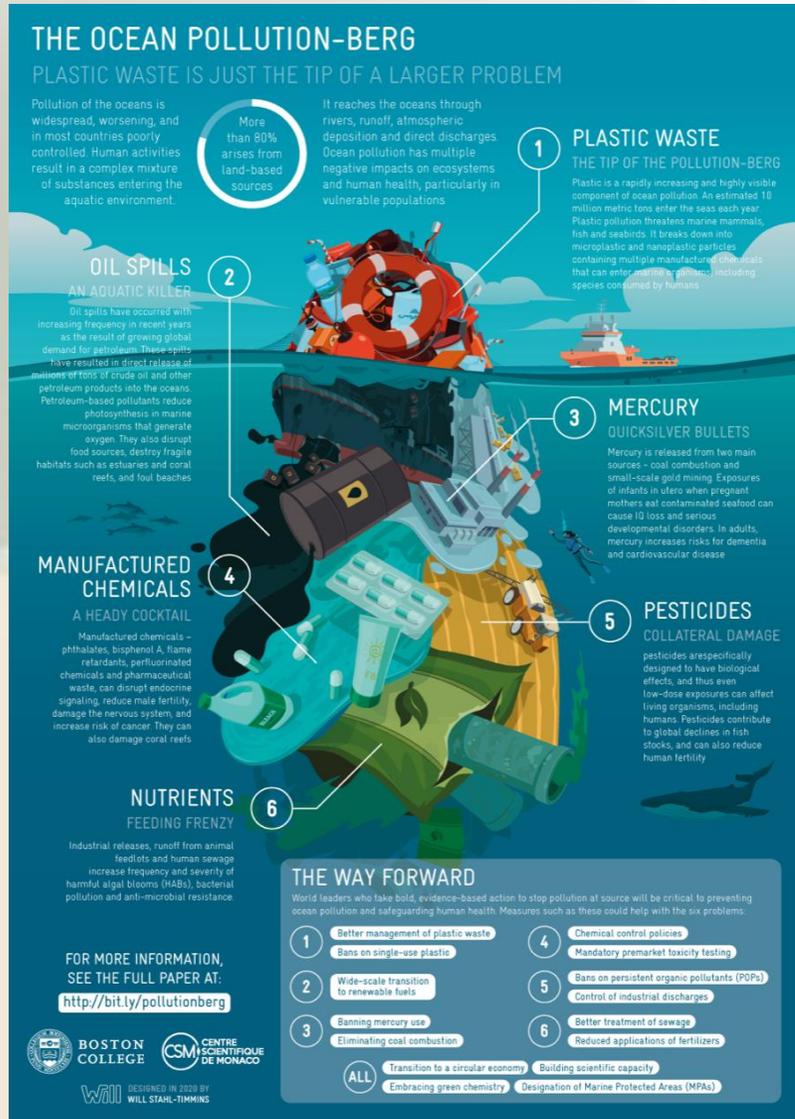
Create a single A4 infographic with scientific graphs, photos to explain the current effects of Mass Bleaching events on the GBR. Ensure you include information to answer the following:

- What the 2024 bleaching event was.
- Why corals are sensitive to heat.
- What the data tells us.
- How individuals or communities can support reef resilience.

Keep it short, simple and visually engaging. This will form part of your final report for assessment for this unit.



Infographic - example



Concise
Clear
Use graphics/photos
Facts
Figures
Be visually engaging
Colouring scheme to match content



Hobart Zoo and Aquarium - 2026

Exploring the scientific laboratory

Essential equipment and techniques



Safety First

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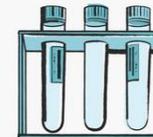
Basic Instruments

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Fundamental Techniques

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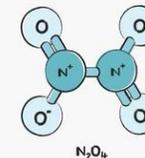
The Scientific Method in Action

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Responsibility and Sustainability

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Learning Intentions

- Educate others and communicate the current situation on the Great Barrier Reef.
- Communicate the role that modern Aquariums such as Hobart Zoo and Aquarium have in raising awareness of the situation on the GBR.

Success Criteria

Over a series of lessons, you will produce a multi page report including your infographic to demonstrate your understanding of the current situation on the Great Barrier Reef and the role modern Aquariums have in raising awareness to foster change.



Write and Produce a Report

- The purpose of this is to educate your family and demonstrate your key understandings from this unit.
- Your report should be concise and aesthetically engaging by including visual representations, diagrams and photographs from reputable Australian Sources.
- You will have ___ lessons to draft, edit, type and print your report.



Mass Coral Bleaching Report Assessment Advice

This advice will guide you through creating your assessment on the 2024 Mass Coral Bleaching Event. You will explain bleaching, apply Shelford's Law of Tolerance, include graphs, and integrate photos from our excursion. You will also reflect on how marine biologists and aquarists design and maintain aquarium systems to mimic Great Barrier Reef conditions.

Student Checklist

- Define what a coral reef is.
- Discuss how the Government measure the health of the reef.
- Explain mass coral bleaching on the Great Barrier Reef clearly.
- Apply Shelford's Law of Tolerance and include an example from your excursion at Hobart Zoo and Aquarium.
- Include at least two graphs with labels.
- Insert at least three excursion photos with captions.
- Explain how marine biologists and aquarists maintain optimal tank conditions.
- Describe daily/weekly monitoring routines observed and scientific tools used.
- Ensure layout is clear, readable, and visually engaging.
- Include a 200–300 word personal reflection about your learnings throughout the unit and the excursion to Hobart Zoo and Aquarium.



Mass Coral Bleaching Report - Assessment

The report should include information on the following topics. Use these questions to guide your synthesis of information from lessons, your excursion and any additional research you require.

Hobart Zoo and Aquarium



Marine Biology Mass Coral Bleaching and Optimal Reef Conditions

Assessment

This template will guide you through creating your assessment on the 2024 Mass Coral Bleaching Event. You will explain bleaching, apply Shelford's Law of Tolerance, include graphs, and integrate photos from our excursion. You will also reflect on how marine biologists and aquarists design and maintain aquarium systems to mimic Great Barrier Reef conditions.

Student Checklist

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- Discuss how the Government measure the health of the reef.
- Explain mass coral bleaching on the Great Barrier Reef clearly.
- Apply Shelford's Law of Tolerance and include an example from your excursion at Hobart Zoo and Aquarium.
- Include at least two graphs with labels.
- Include your infographic.
- Insert at least 8 photos with captions from your excursion and reputable websites.
- A list of chemicals that are measured in tropical aquatic ecosystems and what optimal levels should be in aquariums to replicate wild conditions.
- Explain how marine biologists and aquarists maintain optimal tank conditions.
- Describe daily/weekly monitoring routines observed and scientific tools used.
- Ensure layout is clear, readable, and visually engaging.
- Include a 200-300 word personal reflection about your learnings throughout the unit and the excursion to Hobart Zoo and Aquarium.
- Include a reference list of all sources used.

The report should include information on the following topics. Use these questions to guide your synthesis of information from lessons, your excursion and any additional research you require.

Section A: Mass Coral Bleaching Explanation

What is a coral reef?



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Where are coral reefs located in Australia?

What is coral bleaching? Explain what happens to a coral when it bleaches and why this is a sign of stress.

How does the Australian Government measure the health of the Great Barrier Reef.

Why did the 2024 bleaching event happen? Describe why the Great Barrier Reef experienced a major bleaching event in 2024.

Section B: What Happened on the Reef in 2024?

Which parts of the Reef were most affected? Describe what happened in one region.

Why do you think some reefs had high bleaching while others nearby had only low or moderate bleaching?

Section C: Shelford's Law of Tolerance

Explain how Shelford's Law of Tolerance helps us understand bleaching patterns in the 2024 event.

Section D: Local Connection – Hobart Zoo & Aquarium

Describe two ways the Hobart Zoo and Aquarium helps support coral reef conservation and community understanding.

Explain how aquariums that mimic real ecosystems help people learn about tolerance limits, stress, and coral health. Include how they apply the principles of Shelford's Law of Tolerance to ensure that conditions are within the optimal range.



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What tools do they use for this and what do they assess? Include a list of the chemicals that are measured in tropical aquatic ecosystems and what optimal levels should be in aquariums to replicate wild conditions.

What is the nitrate cycle?

What are the optimal chemical conditions of a tropical reef aquarium?

Explain how Shelford's Law of Tolerance helps them choose species to cohabit in these recreated ecosystems.

Section E: Possibly Strategies

Write one idea for a management or protection strategy that could support coral recovery or help corals stay within their tolerance limits.

Section F: Personal Reflection

Write a personal reflection to synthesise your new learnings from this unit and your opinion, based on evidence, of the importance of modern aquariums like Hobart Zoo and Aquarium in contributing to humans making changes to support the regeneration of the Great Barrier Reef.

What can you do in your local community to raise awareness?



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**Well Done on
Completing this unit on
Mass Coral Bleaching
and
Maintaining Optimal
Reef Conditions!**

Celebrate and Share

