

Understanding how the Great Barrier Reef is changing

Information about the AIMS Long-Term Monitoring Program

The Australian Institute of Marine Science's [Long-Term Monitoring Program](#) measures the condition of reefs in the Great Barrier Reef World Heritage Area.

It comprises the most comprehensive record available of the changing state of the Reef, and is an essential resource for governments, the science community and everyone involved in its management and protection.

The Great Barrier Reef (GBR) is a rich and complex natural ecosystem. It is the largest coral system on the planet, containing almost 3,000 individual reefs. It stretches over 2,300 kilometres and covers an area of 344,400 square kilometres.

The Reef is of extraordinary natural beauty. It contributes [\\$6.4 billion each year to the Australian economy](#), and supports 64,000 jobs.

It is also subject to significant environmental pressures, including marine heatwaves associated with climate change, cyclones, and crown-of-thorns starfish outbreaks. High quality data on its current state and how it is changing through time is essential for its continued management and protection.

AIMS has had a mandate to explore and research the Reef since 1972. The Long-Term Monitoring Program (LTMP) was established in 1983 and involves a team of specially trained marine scientists spending more than 120 days a year surveying between 80 and 100 reefs along the length and breadth of the GBR.

Since 2005, additional reefs – surveyed separately as part of the collaborative [Great Barrier Reef Marine Monitoring Program](#) – provide additional information on the health of reefs close to the coast. These reefs are [reported on separately](#).

In 2006, the Program was adjusted to accommodate investigations of the effectiveness of re-zoning within the Marine Park.

In its 30+ year history, the Program has surveyed more than 490 reefs.

The result is the most comprehensive and extensive record of coral health on any reef ecosystem in the world.

What is the aim of the Program?

The objectives of the Long-Term Monitoring Program on the GBR are to:

- monitor reefs across the GBR to provide information on the status and trends of reef condition, including the distribution and abundance of reef biota;
- provide environmental managers with a context for assessing impacts of human activities within the Marine Park and for managing the GBR for ecologically sustainable use;
- examine the effects of re-zoning within the Marine Park on reef communities.

What does the program measure?

The program assesses many aspects of coral reef health over time, including:

- the proportion and composition of living hard coral, soft coral, and other organisms on the reef surface;
- levels of coral bleaching;
- numbers of crown-of-thorns starfish;
- coral disease;
- juvenile corals;
- reef fish species abundance, length and biomass, including coral trout and other commercially important species including snapper, emperors, cods and wrasses;
- numbers of sharks.

How is reef health measured?

Data are gathered through [two globally used, standard methods](#):

Manta tow surveys involve towing researchers behind boats to observe the perimeter of entire reefs, allowing large areas of reef to be surveyed quickly with minimal equipment. These surveys have been used since the Program began in 1983 and identify reef-wide changes in coral cover, as well as the abundance of crown-of-thorns starfish, coral trout and sharks.

Fixed site surveys are conducted by SCUBA divers along permanently marked stretches of reef and are repeated every one or two years. Since 1993, fixed site surveys have provided details of reef dynamics using photographic surveys of stationary reef organisms such as corals, and visual counts by experienced, trained observers of reef fish, juvenile corals, crown-of-thorns starfish, and coral-eating snails, as well as coral disease and bleaching.

To augment the information gathered by these methods, AIMS recently developed innovative technologies to increase efficiency and provide more insight. These include high-tech computer programs to visualise reefs in 3D, and a machine-learning coral recognition system called [BenthoBox](#) which speeds up data analysis.

Why is the long-term monitoring of coral reefs important?

Coral reefs undergo cycles of disturbance and recovery which take place over several decades. Information about natural variability of populations based on this long-term cycle is essential for informed management.

What reports are produced out of the LTMP?

AIMS researchers process and analyse data from surveys within weeks of returning from the field. Reports based on 11 sectors are produced as well as each reef surveyed.

[Sector reports](#) and [individual reef reports](#) are available from the AIMS website.

Each year, [an annual report updates](#) our understanding of condition across the Reef based on the manta tow surveys. This provides excellent indications of trends and status across the Northern, Central and Southern regions.

Data from the [Long-Term Monitoring Program and Marine Monitoring Program](#) from 1992 onwards are available for the science community.

What difference has the LTMP made?

The LTMP is a critical source of data and information on the health of the Great Barrier Reef:

- It has been used by the Great Barrier Reef Marine Park Authority to inform management decisions regarding the effectiveness of no-fishing zones since 2004 and crown-of-thorns outbreaks;
- The data contribute to the [GBRMPA Outlook Report](#) and the [Reef 2050 Long-Term Sustainability Plan](#);
- It has formed the basis of more than 140 peer-reviewed publications, contributing fundamental knowledge about coral reefs, how the Great Barrier Reef works, and how it is changing.

Stay up-to-date with the AIMS Long-Term Monitoring Program

Each survey report can be delivered to your inbox.

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Contact

For more information on the AIMS Long-Term Monitoring Program, email monitoring@aims.gov.au.

More about the Australian Institute of Marine Science

The Australian Institute of Marine Science (AIMS) is Australia's tropical marine research agency.

In existence for almost 50 years, it is a statutory authority that plays a pivotal role in providing large-scale, long-term and world-class research that helps governments, industry and the wider community to make informed decisions about the management of Australia's marine estate.

AIMS science leads to healthier marine ecosystems; economic, social and environmental benefits for all Australians; and protection of coral reefs from climate change.

More here: <https://www.aims.gov.au/>