

Great Barrier Reef

Report Card **2011**
Reef Water Quality Protection Plan



Australian Government



Queensland Government

Progress towards targets up to June 2011

Management practice indicators

A significant proportion of the agricultural industry has adopted individual improved land management practices since 2009 which will help reduce the amount of pollutants leaving the catchment and entering the reef. The status of each industry under the ABCD management practice framework is presented in the supporting technical report.

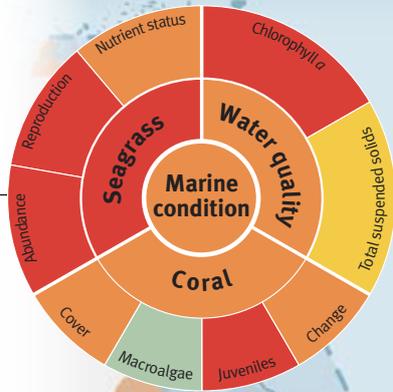
Catchment indicators

Changes in land management have translated into a reduction in the amount of key pollutants leaving the end of catchments, which will have a positive impact on the reef in the long term. Groundcover remains high due to high rainfall.

| | Grazing Proportion of graziers who adopted improved practices between 2009 and 2011. Target: 50 per cent by 2013 | Sugarcane Proportion of producers who adopted improved practices between 2009 and 2011. Target: 80 per cent by 2013 | Horticulture Proportion of producers who adopted improved practices between 2009 and 2011. Target: 80 per cent by 2013 | Groundcover Late dry season groundcover as at 2010-2011. Target: 50 per cent by 2013 | Nitrogen Reduction in annual average total nitrogen load between 2009 and 2011. Target: 50 per cent by 2013 | Sediment Reduction in annual average sediment load between 2009 and 2011. Target: 20 per cent by 2020 | Pesticides Reduction in annual average pesticide load between 2009 and 2011. Target: 50 per cent by 2013 |
|--|--|---|--|--|---|---|--|
| Great Barrier Reef The greatest water quality risks to the Great Barrier Reef are nitrogen, sediment and pesticides ¹ . |  17% |  34% |  25% |  91% |  7% |  6% |  15% |
| Cape York Includes 43,000 square kilometres of catchments that drain into the reef. The main agricultural land use is grazing. Low risk relative to other regions. |  33% | |  40% | |  4% |  4% | |
| Wet Tropics Covers 22,000 square kilometres. The main agricultural land uses are grazing, sugarcane and horticulture. Very high risk from nitrogen and pesticides from sugarcane. |  16% |  37% |  24% |  95% |  4% |  3% |  10% |
| Burdekin Covers 141,000 square kilometres and is largely drained by the Burdekin River system. The main agricultural land use is grazing. High risk from nitrogen and pesticides from sugarcane and sediment from grazing. |  20% |  28% |  27% |  92% |  8% |  10% |  17% |
| Mackay Whitsunday Covers an area of 9000 square kilometres. The main agricultural land uses are grazing and sugarcane. Moderate risk from pesticides from sugarcane. |  36% |  30% |  47% |  92% |  13% |  6% |  31% |
| Fitzroy Covers 156,000 square kilometres and is the largest region draining into the reef lagoon. Grazing is the predominant land use. High risk from sediment from grazing. |  16% |  18% (Grains) |  13% |  90% |  2% |  3% |  4% |
| Burnett Mary Covers 53,000 square kilometres. The main agricultural land use is grazing. Low risk relative to other regions. |  13% |  42% |  25% |  93% |  8% |  3% |  17% |

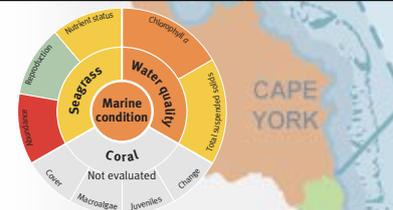
Marine condition

Improvements in catchment management will take time to translate into improved marine condition, particularly given the strong influence of extreme weather events in recent years, including 2010-2011 (see over for details). There is low confidence in the Cape York and Burnett Mary results due to limited data availability and validation.



Great Barrier Reef-wide

The overall condition of the reef in 2010-2011 declined from moderate to poor. Inshore water quality was poor overall and varied from moderate to poor depending on the region. Inshore seagrass was in very poor condition overall, and its condition has continued to decline since 2006-2007. Inshore coral reefs were in poor condition overall.



Cape York

The marine condition off Cape York was poor. Inshore water quality was poor and the one southern seagrass bed monitored was in moderate condition.



Wet Tropics

The Wet Tropics' marine condition declined from moderate to poor. Inshore water quality and seagrass meadows were in poor condition and coral reefs were in moderate condition.



Burdekin

The Burdekin's marine condition remained poor. Inshore water quality was moderate overall, while inshore seagrass meadows declined from poor to very poor and coral reefs remained in poor condition.



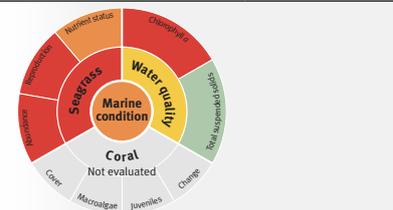
Mackay Whitsunday

The Mackay Whitsunday's marine condition declined from moderate to poor. Inshore water quality also declined from moderate to poor, inshore seagrass meadows declined from poor to very poor and coral reefs remained in moderate condition.



Fitzroy

The Fitzroy's marine condition declined from moderate to poor. Inshore water quality and inshore seagrass meadows also declined from moderate to poor and coral reefs remained in poor condition.



Burnett Mary

The Burnett Mary's marine condition remained poor. Inshore water quality remained moderate and the condition of seagrass declined from poor to very poor.

“Marine results are shown for inshore areas of the reef only. Water quality at mid and outer shelf sites is generally good to very good because it is less influenced by river discharge.”

Scoring system

A standardised scoring system was developed for each of the key indicators in the report card. The scoring system is used to assess and communicate the progress towards the goals and targets using the following categories:



The Reef Plan targets are considered ambitious. Therefore, progress that is equal to or exceeds the target is considered very good. Further details on the scoring system for each indicator are outlined in the supporting technical information on the Reef Plan website, www.reefplan.qld.gov.au.

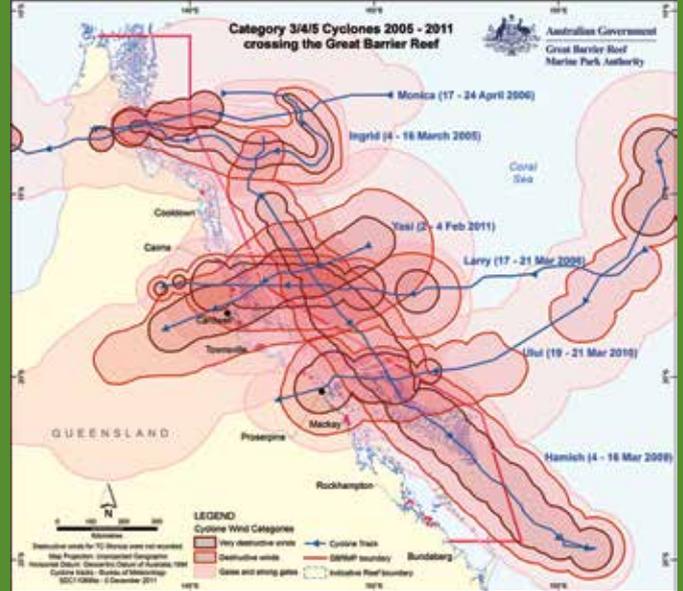
Impact of extreme weather

The summer of 2010-2011 was the second wettest on record in Australia. This extreme weather caused flooding in several catchments and much higher than normal discharge from most rivers. A large expanse of the inshore reef south of Mackay was exposed to persistent flood plumes from the Fitzroy, Burnett and Mary Rivers.



Catchment runoff entering the Great Barrier Reef lagoon, north of Mossman. Photo: courtesy Queensland Government Department of Agriculture, Fisheries and Forestry.

Tropical Cyclone Yasi, one of the largest and most powerful cyclones to affect Australia since records began, crossed the Queensland coast near Mission Beach in February 2011 causing damage to seagrass meadows and the reef from Cooktown to Mackay. This has led to the poor marine condition in many regions for 2011. Underwater surveys indicate that 15 per cent of the total reef area sustained some coral damage and full recovery will take decades.



Extent of the Great Barrier Reef impacted by Category 4 or 5 cyclones in the six year period 2005-2011. Map: Courtesy of the Spatial Data Centre, Great Barrier Reef Marine Park Authority.

About the indicators

Management practices

Land management practices have been improving over time. Progress from the 2008–2009 baseline to 2011 is presented in this report card. Information for the cotton and dairy industries is not currently available. Further information on improvements in management practices (and systems) is available on the Reef Plan website, www.reefplan.qld.gov.au.

Catchment indicators

Reef Plan's catchment targets aim to minimise the loss of wetlands, improve the condition of riparian areas and maintain groundcover on grazing land above 50 per cent to minimise soil erosion. Groundcover levels are estimated using satellite imagery. Progress for wetlands and riparian areas is not provided in this report card as they are only monitored every four years (see Report Card 2010 for latest data).

Catchment loads

The pollutant loads leaving catchments and entering the reef vary significantly from year to year, mainly due to differences in annual rainfall. The 2010-2011 year was a period of very high rainfall. Catchment modelling has been used to correct the annual pollutant loads for climate variability and estimate the long term annual load reductions due to the adoption of improved management practices. Progress towards load reduction targets is modelled using well documented methods and assumptions, and long term water quality monitoring is used to validate these modelled results. Progress is measured in terms of the reduction in loads due to agriculture (termed 'anthropogenic load' in this context).

The catchment loads targets are ambitious measures designed to be met in 2013 for nutrients and pesticides and 2020 for sediment. This report card presents information as at June 2011, covering the first two years

of Reef Plan 2009 implementation. More progress will be evident in subsequent report cards. The load reductions do not include all activities undertaken during the reporting period and are, therefore, considered an underestimate of total progress. For example, changes in the horticulture and dairy industries and parts of the grains industry have not been modelled at this time. Despite this, the results are positive and indicate the program is starting to halt and reverse the decline in water quality.

Marine indicators

Chlorophyll *a* indicates nutrient availability and productivity.

Total suspended solids measures particulate matter in water.

Seagrass abundance includes the cover and change in cover.

Reproduction indicates the potential of seagrass meadows to recover from disturbances.

Nutrient status measures the response of seagrass to nutrient conditions in surrounding waters.

Coral cover is a measure of the percentage of coral across reefs, and indicates the capacity of coral to persist under the current environmental conditions and its potential to recover.

Coral change measures change in coral cover which indicates coral resilience to disturbance.

Macroalgal cover - high abundance indicates poor water quality and negatively affects the resilience of coral communities.

Coral juvenile density measures the abundance of corals less than 10 centimetres in diameter which indicates the recovery potential from disturbances.

Key findings

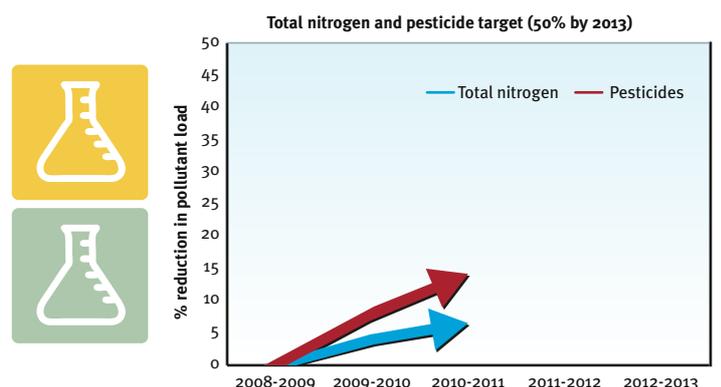
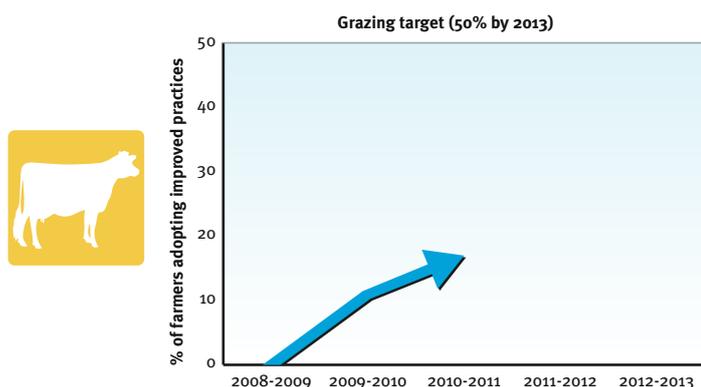
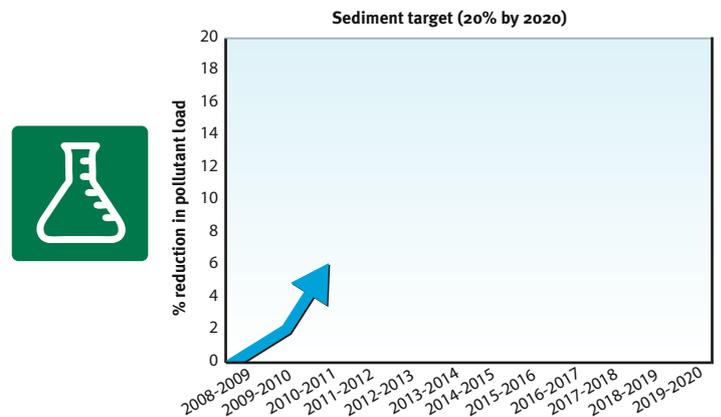
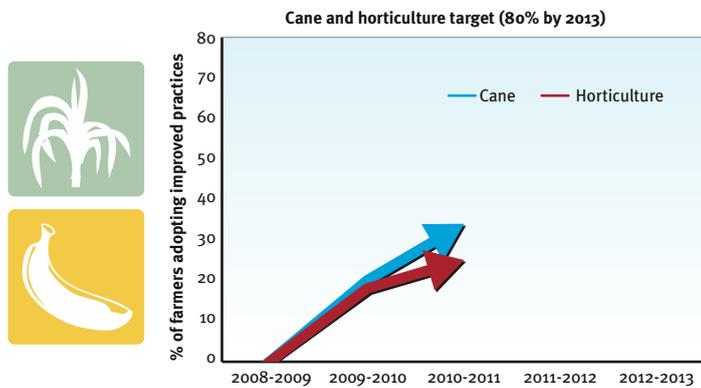
This report card measures progress from the 2009 baseline towards Reef Water Quality Protection Plan (Reef Plan) targets. It assesses the combined results of all Reef Plan actions up to June 2011.

- Improving Great Barrier Reef water quality is a complex and challenging problem which requires a concerted effort and strong partnerships. This report card confirms that management change and water quality improvements are on a positive trajectory.
- Progress towards the Reef Plan targets continues to be encouraging, particularly the on-ground management practice changes which are starting to reduce pollutant loads entering the reef. However, it will take more time for these achievements to translate into improved marine condition, particularly given the impacts of extreme weather events in recent years.
- Extreme weather events in 2010-2011 included high rainfall causing much higher than average discharge for most rivers, especially the Fitzroy and Proserpine Rivers. In addition, Tropical Cyclone Yasi passed across the reef in early 2011, causing damage to seagrass meadows and reefs from Cooktown to Mackay.
- These extreme weather events significantly impacted the overall condition of the marine environment which declined from moderate to poor overall in 2010-2011.
- Major positive change has been observed in the reef catchments. Overall, across the Great Barrier Reef region, land managers have made good progress towards the Reef Plan targets. Thirty four per cent of sugarcane growers, 17 per cent of graziers and 25 per cent of horticulture producers adopted improved management practices by June 2011. The highest regional level of adoption in the grazing and horticulture industries was in the Mackay Whitsunday region and the highest level of adoption in the sugarcane industry was in the Burnett Mary region.
- The estimated annual average sediment load reduced by six per cent with good to very good progress across all regions. The total nitrogen load reduced by seven per cent; however dissolved nitrogen, the key pollutant of concern, reduced by 13 per cent. The pesticide load reduced by 15 per cent, with a 31 per cent reduction in the Mackay Whitsunday region.
- The on-ground progress has been driven primarily by the Australian Government's Reef Rescue program along with Queensland Government and industry-led initiatives.

Tracking towards targets

Reef Plan has ambitious targets against which progress is reported. It includes targets to halve nutrient and pesticide loads by 2013 and to reduce sediment by 20 per cent by 2020. It also includes targets to encourage 80 per cent of the cane and horticulture industries and 50 per cent of the grazing industry to adopt improved practices by 2013.

This report card covers progress between 2009 and 2011 and shows a positive trajectory in both the adoption of improved land management practices and pollutant load reductions. This is a significant achievement following a long history of declining water quality and is an encouraging sign that Reef Plan is starting to halt and reverse the decline in the quality of water entering the reef.



Great Barrier Reef

The Great Barrier Reef is the largest and best-known coral reef ecosystem in the world, spanning 2300 kilometres along the Queensland coast. The coral reefs—almost 3000 in total— represent about 10 per cent of all the coral reef areas in the world. The Great Barrier Reef receives runoff from 35 major catchments which drain 424,000 square kilometres of coastal Queensland. These catchments are spread from the Cape York region in the north to the Burnett Mary region in the south. Climate and soil characteristics vary across the catchments. Grazing (77 per cent) is the dominant agricultural land use. Sugarcane (1.4 per cent) and horticultural crops (0.2 per cent) are more prevalent in areas with high rainfall and coastal irrigation. Grain crops and irrigated cotton are prevalent in the inland areas of the Fitzroy region.

Poor water quality from catchment runoff affects the health of the reef, causing degradation of inshore reefs and contributing to crown-of-thorns starfish outbreaks. This decreases the Great Barrier Reef's ability to withstand and recover from other impacts caused by climate change, such as coral bleaching and damage from increased storm intensity.

Reef Plan

The Reef Water Quality Protection Plan is a joint commitment of the Australian and Queensland Governments to minimise the risk to the reef ecosystem from a decline in the quality of water entering the reef from adjacent catchments. It has been established to galvanise and target the collective actions of governments and the community for the protection of the reef. Reef Plan focuses on reducing the impacts of diffuse source agricultural pollution on the health and resilience of the reef. For more information, see www.reefplan.qld.gov.au.

Paddock to Reef

The Paddock to Reef program, funded jointly by the Australian and Queensland Governments, is a highly innovative approach to integrating monitoring and modelling information on management practices, catchment indicators, catchment loads and the health of the reef. This program integrates the best available information, recognising that data confidence varies across the indicators and regions. The quality of data is continually improving; however it is expected that some data may be updated as new methodologies are applied and more information becomes available.



Contributors



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More information

More information, methods and detailed results can be found on the Reef Plan website at www.reefplan.qld.gov.au.

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