

## 8. ACKNOWLEDGEMENTS

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## Appendices

### A. THRESHOLDS

Table A1: Water Quality Threshold values for each Measure in each Zone (Region/Water Body). Thresholds values are similar to annual Guideline values. Wet and Dry represent Wet and Dry season thresholds respectively. Direction of Failure indicates whether a values higher ('H') or lower ('L') than a Threshold would constitute an exceedance. Range From and Range To represent Thresholds for Measures that have a range of optimum values (such as dissolved oxygen or pH).

| Measure | Units            | Water Body       | Region            | Threshold |       | Direction of Failure | Justification                                |
|---------|------------------|------------------|-------------------|-----------|-------|----------------------|--|
|         |                  |                  |                   | Annual    | Dry   |                      |  |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Cape York         | 2.00      | 2.00  | 2.00                 | QLD WQ guidelines                            |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Wet Tropics       | 1.10      | 1.10  | 1.10                 | There is no seasonal adjustment              |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Dry Tropics       | 1.00      | 1.00  | 1.00                 |  |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Mackay Whitsunday | 1.30      | 1.30  | 1.30                 |  |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Fitzroy           | 2.00      | 2.00  | 2.00                 |  |
| chl     | µg <sup>-1</sup> | Enclosed Coastal | Burnett Mary      | 2.00      | 2.00  | 2.00                 |  |
| chl     | µg <sup>-1</sup> | Open Coastal     | Cape York         | 0.45      | 0.63  | 0.32                 | GBRMPA WQ guidelines                         |
| chl     | µg <sup>-1</sup> | Open Coastal     | Wet Tropics       | 0.45      | 0.63  | 0.32                 | 40% higher in summer, 30% lower in winter    |
| chl     | µg <sup>-1</sup> | Open Coastal     | Dry Tropics       | 0.45      | 0.63  | 0.32                 | Here summer is taken as Wet Season           |
| chl     | µg <sup>-1</sup> | Open Coastal     | Mackay Whitsunday | 0.45      | 0.63  | 0.32                 | and winter is taken as Dry Season            |
| chl     | µg <sup>-1</sup> | Open Coastal     | Fitzroy           | 0.45      | 0.63  | 0.32                 |  |
| chl     | µg <sup>-1</sup> | Open Coastal     | Burnett Mary      | 0.45      | 0.63  | 0.32                 |  |
| chl     | µg <sup>-1</sup> | Midshelf         | Cape York         | 0.45      | 0.63  | 0.32                 | GBRMPA WQ guidelines                         |
| chl     | µg <sup>-1</sup> | Midshelf         | Wet Tropics       | 0.45      | 0.63  | 0.32                 | 40% higher in summer, 30% lower in winter    |
| chl     | µg <sup>-1</sup> | Midshelf         | Dry Tropics       | 0.45      | 0.63  | 0.32                 | Here summer is taken as Wet Season           |
| chl     | µg <sup>-1</sup> | Midshelf         | Mackay Whitsunday | 0.45      | 0.63  | 0.32                 | and winter is taken as Dry Season            |
| chl     | µg <sup>-1</sup> | Midshelf         | Fitzroy           | 0.45      | 0.63  | 0.32                 |  |
| chl     | µg <sup>-1</sup> | Midshelf         | Burnett Mary      | 0.45      | 0.63  | 0.32                 |  |
| chl     | µg <sup>-1</sup> | Offshore         | Cape York         | 0.40      | 0.56  | 0.28                 | GBRMPA WQ guidelines                         |
| chl     | µg <sup>-1</sup> | Offshore         | Wet Tropics       | 0.40      | 0.56  | 0.28                 | 40% higher in summer, 30% lower in winter    |
| chl     | µg <sup>-1</sup> | Offshore         | Dry Tropics       | 0.40      | 0.56  | 0.28                 | Here summer is taken as Wet Season           |
| chl     | µg <sup>-1</sup> | Offshore         | Mackay Whitsunday | 0.40      | 0.56  | 0.28                 | and winter is taken as Dry Season            |
| chl     | µg <sup>-1</sup> | Offshore         | Fitzroy           | 0.40      | 0.56  | 0.28                 |  |
| chl     | µg <sup>-1</sup> | Offshore         | Burnett Mary      | 0.40      | 0.56  | 0.28                 |  |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Cape York         | 10.00     | 10.00 | 10.00                | QLD WQ guidelines                            |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Wet Tropics       | 10.00     | 10.00 | 10.00                | There is no seasonal adjustment and          |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Dry Tropics       | 10.00     | 10.00 | 10.00                | values for CY and WT are not determined      |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Mackay Whitsunday | 10.00     | 10.00 | 10.00                | Suggest applying same ratio as for turbidity |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Fitzroy           | 15.00     | 15.00 | 15.00                | between CY/WT and others, i.e (15*10)/6=25   |
| nap     | mg <sup>-1</sup> | Enclosed Coastal | Burnett Mary      | 15.00     | 15.00 | 15.00                | NAP is taken as = TSS in this context        |
| nap     | mg <sup>-1</sup> | Open Coastal     | Cape York         | 2.00      | 2.40  | 1.60                 | GBRMPA WQ guidelines                         |
| nap     | mg <sup>-1</sup> | Open Coastal     | Wet Tropics       | 2.00      | 2.40  | 1.60                 | 20% higher in summer, 20% lower in winter    |
| nap     | mg <sup>-1</sup> | Open Coastal     | Dry Tropics       | 2.00      | 2.40  | 1.60                 | Here summer is taken as Wet Season           |
| nap     | mg <sup>-1</sup> | Open Coastal     | Mackay Whitsunday | 2.00      | 2.40  | 1.60                 | and winter is taken as Dry Season            |
| nap     | mg <sup>-1</sup> | Open Coastal     | Fitzroy           | 2.00      | 2.40  | 1.60                 |  |
| nap     | mg <sup>-1</sup> | Open Coastal     | Burnett Mary      | 2.00      | 2.40  | 1.60                 | NAP is taken as = TSS in this context        |
| nap     | mg <sup>-1</sup> | Midshelf         | Cape York         | 2.00      | 2.40  | 1.60                 | GBRMPA WQ guidelines                         |
| nap     | mg <sup>-1</sup> | Midshelf         | Wet Tropics       | 2.00      | 2.40  | 1.60                 | 20% higher in summer, 20% lower in winter    |
| nap     | mg <sup>-1</sup> | Midshelf         | Dry Tropics       | 2.00      | 2.40  | 1.60                 | Here summer is taken as Wet Season           |
| nap     | mg <sup>-1</sup> | Midshelf         | Mackay Whitsunday | 2.00      | 2.40  | 1.60                 | and winter is taken as Dry Season            |
| nap     | mg <sup>-1</sup> | Midshelf         | Fitzroy           | 2.00      | 2.40  | 1.60                 |  |
| nap     | mg <sup>-1</sup> | Midshelf         | Burnett Mary      | 2.00      | 2.40  | 1.60                 | NAP is taken as = TSS in this context        |

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| Measure | Units             | Water Body       | Region            | Threshold |       |       | Direction of Failure | Justification   |
|---------|-------------------|------------------|-------------------|-----------|-------|-------|----------------------|---|
|         |                   |                  |                   | Annual    | Dry   | Wet   |                      |   |
| nap     | mgL <sup>-1</sup> | Offshore         | Cape York         | 0.70      | 0.84  | 0.56  | H                    | GBRMPA WQ guidelines                                  |
| nap     | mgL <sup>-1</sup> | Offshore         | Wet Tropics       | 0.70      | 0.84  | 0.56  | H                    | 20% higher in summer; 20% lower in winter             |
| nap     | mgL <sup>-1</sup> | Offshore         | Dry Tropics       | 0.70      | 0.84  | 0.56  | H                    | Here summer is taken as Wet Season                    |
| nap     | mgL <sup>-1</sup> | Offshore         | Mackay Whitsunday | 0.70      | 0.84  | 0.56  | H                    | and winter is taken as Dry Season                     |
| nap     | mgL <sup>-1</sup> | Offshore         | Fitzroy           | 0.70      | 0.84  | 0.56  | H                    |   |
| nap     | mgL <sup>-1</sup> | Offshore         | Burnett Mary      | 0.70      | 0.84  | 0.56  | H                    | NAP is taken as = TSS in this context                 |
| ntu     | NTU               | Enclosed Coastal | Cape York         | 4.00      | 4.00  | 4.00  | H                    | QLD WQ guidelines                                     |
| ntu     | NTU               | Enclosed Coastal | Wet Tropics       | 4.00      | 4.00  | 4.00  | H                    | There is no seasonal adjustment                       |
| ntu     | NTU               | Enclosed Coastal | Dry Tropics       | 4.00      | 4.00  | 4.00  | H                    |   |
| ntu     | NTU               | Enclosed Coastal | Mackay Whitsunday | 4.00      | 4.00  | 4.00  | H                    | Unclear as to why the CY/WT guidelines                |
| ntu     | NTU               | Enclosed Coastal | Fitzroy           | 6.00      | 6.00  | 6.00  | H                    | are higher than Southern regions                      |
| ntu     | NTU               | Enclosed Coastal | Burnett Mary      | 6.00      | 6.00  | 6.00  | H                    |   |
| ntu     | NTU               | Open Coastal     | Cape York         | 1.50      | 1.80  | 1.20  | H                    | No guideline available but turbidity needed if logger |
| ntu     | NTU               | Open Coastal     | Wet Tropics       | 1.50      | 1.80  | 1.20  | H                    | data is to be integrated.                             |
| ntu     | NTU               | Open Coastal     | Dry Tropics       | 1.50      | 1.80  | 1.20  | H                    | MMP used a correlation between TSS and NTU            |
| ntu     | NTU               | Open Coastal     | Mackay Whitsunday | 1.50      | 1.80  | 1.20  | H                    | (based on whole of GBR data) which is also used here  |
| ntu     | NTU               | Open Coastal     | Fitzroy           | 1.50      | 1.80  | 1.20  | H                    |   |
| ntu     | NTU               | Open Coastal     | Burnett Mary      | 1.50      | 1.80  | 1.20  | H                    | Applied 20% higher in summer; 20% lower in winter     |
| ntu     | NTU               | Midshelf         | Cape York         | 1.50      | 1.80  | 1.20  | H                    | No guideline available but turbidity needed if logger |
| ntu     | NTU               | Midshelf         | Wet Tropics       | 1.50      | 1.80  | 1.20  | H                    | data is to be integrated.                             |
| ntu     | NTU               | Midshelf         | Dry Tropics       | 1.50      | 1.80  | 1.20  | H                    | MMP used a correlation between TSS and NTU            |
| ntu     | NTU               | Midshelf         | Mackay Whitsunday | 1.50      | 1.80  | 1.20  | H                    | (based on whole of GBR data) which is also used here  |
| ntu     | NTU               | Midshelf         | Fitzroy           | 1.50      | 1.80  | 1.20  | H                    |   |
| ntu     | NTU               | Midshelf         | Burnett Mary      | 1.50      | 1.80  | 1.20  | H                    | Applied 20% higher in summer; 20% lower in winter     |
| ntu     | NTU               | Offshore         | Cape York         | 1.00      | 1.20  | 0.80  | H                    | No guideline available but turbidity needed if logger |
| ntu     | NTU               | Offshore         | Wet Tropics       | 1.00      | 1.20  | 0.80  | H                    | data is to be integrated.                             |
| ntu     | NTU               | Offshore         | Dry Tropics       | 1.00      | 1.20  | 0.80  | H                    | MMP used a correlation between TSS and NTU            |
| ntu     | NTU               | Offshore         | Mackay Whitsunday | 1.00      | 1.20  | 0.80  | H                    | (based on whole of GBR data) which is also used here  |
| ntu     | NTU               | Offshore         | Fitzroy           | 1.00      | 1.20  | 0.80  | H                    |   |
| ntu     | NTU               | Offshore         | Burnett Mary      | 1.00      | 1.20  | 0.80  | H                    | Applied 20% higher in summer; 20% lower in winter     |
| sd      | m                 | Enclosed Coastal | Cape York         | 1.00      | 1.00  | 1.00  | L                    | QLD WQ guidelines                                     |
| sd      | m                 | Enclosed Coastal | Wet Tropics       | 1.00      | 1.00  | 1.00  | L                    | There is no seasonal adjustment                       |
| sd      | m                 | Enclosed Coastal | Dry Tropics       | 1.50      | 1.50  | 1.50  | L                    |   |
| sd      | m                 | Enclosed Coastal | Mackay Whitsunday | 1.00      | 1.00  | 1.00  | L                    | Unclear as to why the CY/WT guidelines                |
| sd      | m                 | Enclosed Coastal | Fitzroy           | 1.50      | 1.50  | 1.50  | L                    | are lower than Southern regions                       |
| sd      | m                 | Enclosed Coastal | Burnett Mary      | 1.50      | 1.50  | 1.50  | L                    |   |
| sd      | m                 | Open Coastal     | Cape York         | 10.00     | 10.00 | 10.00 | L                    | GBRMPA WQ guidelines                                  |
| sd      | m                 | Open Coastal     | Wet Tropics       | 10.00     | 10.00 | 10.00 | L                    | There is no seasonal adjustment                       |
| sd      | m                 | Open Coastal     | Dry Tropics       | 10.00     | 10.00 | 10.00 | L                    |   |
| sd      | m                 | Open Coastal     | Mackay Whitsunday | 10.00     | 10.00 | 10.00 | L                    |   |
| sd      | m                 | Open Coastal     | Fitzroy           | 10.00     | 10.00 | 10.00 | L                    |   |
| sd      | m                 | Open Coastal     | Burnett Mary      | 10.00     | 10.00 | 10.00 | L                    |   |
| sd      | m                 | Midshelf         | Cape York         | 10.00     | 10.00 | 10.00 | L                    | GBRMPA WQ guidelines                                  |
| sd      | m                 | Midshelf         | Wet Tropics       | 10.00     | 10.00 | 10.00 | L                    | There is no seasonal adjustment                       |

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| Measure | Units              | Water Body       | Region            | Threshold |         | Direction of Failure | Justification   |
|---------|--------------------|------------------|-------------------|-----------|---------|----------------------|---|
|         |                    |                  |                   | Annual    | Dry Wet |                      |   |
| sd      | m                  | Midshelf         | Dry Tropics       | 10.00     | 10.00   | L                    |   |
| sd      | m                  | Midshelf         | Mackay Whitsunday | 10.00     | 10.00   | L                    |   |
| sd      | m                  | Midshelf         | Fitzroy           | 10.00     | 10.00   | L                    |   |
| sd      | m                  | Midshelf         | Burnett Mary      | 10.00     | 10.00   | L                    |   |
| sd      | m                  | Offshore         | Cape York         | 17.00     | 17.00   | L                    | GBRMPA WQ guidelines<br>There is no seasonal adjustment |
| sd      | m                  | Offshore         | Wet Tropics       | 17.00     | 17.00   | L                    |   |
| sd      | m                  | Offshore         | Dry Tropics       | 17.00     | 17.00   | L                    |   |
| sd      | m                  | Offshore         | Mackay Whitsunday | 17.00     | 17.00   | L                    |   |
| sd      | m                  | Offshore         | Fitzroy           | 17.00     | 17.00   | L                    |   |
| sd      | m                  | Offshore         | Burnett Mary      | 17.00     | 17.00   | L                    |   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Cape York         | 10.00     | 10.00   | H                    | Old MMP guidelines<br>There is no seasonal adjustment   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Wet Tropics       | 10.00     | 10.00   | H                    |   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Dry Tropics       | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Mackay Whitsunday | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Fitzroy           | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Enclosed Coastal | Burnett Mary      | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Cape York         | 2.00      | 2.00    | H                    | Old MMP guidelines<br>There is no seasonal adjustment   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Wet Tropics       | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Dry Tropics       | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Mackay Whitsunday | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Fitzroy           | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Open Coastal     | Burnett Mary      | 3.00      | 3.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Cape York         | 2.00      | 2.00    | H                    | Old guidelines<br>There is no seasonal adjustment       |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Wet Tropics       | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Dry Tropics       | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Mackay Whitsunday | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Fitzroy           | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Midshelf         | Burnett Mary      | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Cape York         | 2.00      | 2.00    | H                    | Old MMP guidelines<br>There is no seasonal adjustment   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Wet Tropics       | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Dry Tropics       | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Mackay Whitsunday | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Fitzroy           | 2.00      | 2.00    | H                    |   |
| NOx     | µg L <sup>-1</sup> | Offshore         | Burnett Mary      | 2.00      | 2.00    | H                    |   |



B. EREEFS MODELS

Table B2: eReefs regional biogeochemical simulation catalog.

| Simulation name           | Projects | Date range                 | Delivery         | Notes/Improvements   |
|---------------------------|----------|----------------------------|------------------|--|
| GBR4_H1p85_B1p0_Cbas_Dhnd | SIEF     | Jan 1, 2011 – Jun 30, 2014 | Available on NCI | Simulation delivered as part of SIEF project (previously known as 926). Skill assessment available in SIEF report. |
|                           |          |                            |                  |  |
|                           |          |                            |                  |  |