# Macroalgae component

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This is the eighteenth year of the Macroalgae Component.

## Summary of activities

The format for 2023 - 24 followed that of the previous year.

The component consisted of two modules:

1**. Opportunistic Macroalgae Biomass Ring Test (OMB - RT)**: - synthetic samples of different weights for washing and drying to both wet and dry weights.

2. **Opportunistic Macroalgae/Seagrass Cover Ring Test (OMC - RT)**:- estimation of percentage cover of opportunistic macroalgae and seagrass based on photographs of field quadrats.

The analytical procedures of both modules were the same as for the previous years of the Scheme. There were eight laboratories participating in the OMB-RT and eleven laboratories in the OMC-RT.

## Summary of results

**Biomass of macroalgae (OMB-RT15)**

This is the fifteenth year in which biomass of macroalgae has been included as a module of the NMBAQC scheme and was included as a single exercise. The format followed that established by Wells Marine during the previous years of the module (OMB RT01 – RT12 - see [NMBAQC website](https://www.nmbaqcs.org/scheme-components/macroalgae/reports/)). Test material was distributed to participating laboratories along with data forms, which were completed with algal biomass results and returned for analysis.

Eight laboratories were issued with test material, of which six laboratories completed the macroalgae biomass module of the NMBAQC scheme. All participants returned both wet and dry weight data. All of the participating laboratories were government; no other organisations took part in this component of the macroalgae exercises.

As with previous years, results for wet weight of biomass varied between laboratories with some laboratories producing very different measures of biomass when compared against the average biomass and actual/expected biomass. The level of accuracy remains greater for measurement of dry weight than of wet weight, although in RT15 each of the samples had a single dry weight outlier that was noticeably higher than the other five results.

Most of the results for both the dry and wet weights when compared against either mean values or expected/actual weights could be considered acceptable with only three results flagged as ‘fails’ based on resulting z-scores. However, with the low sample size of only six laboratories, high standard deviation values can greatly reduce the chances of a z-score exceeding the +/- 2 cutoff value. The three ‘fails’ represented extreme outliers and were each 2-3 times higher than the expected/actual weights and the results of other participants, suggesting that the instructions were not adhered to for these samples. In each case the results for other samples from the same laboratory did not show the same extreme values, which suggests that there may be differences in methodologies being followed by different individuals processing different samples.

This year has been the second to use mixtures of different materials for two of the samples, following six consecutive years in which each sample consisted of a different artificial material. This approach was well received by participants as being more representative of the mixtures of different algal types that are often found on the shore, although one respondent indicated that their laboratory mostly processed single types of algae in their samples. Based on this feedback samples containing mixtures of different materials will continue to be used in future tests, but at least one of the three samples will still use only a single material type.

**Cover of macroalgae & seagrass (**[**OMC-RT15**](https://www.nmbaqcs.org/scheme-components/macroalgae/reports/omc-rt13-2022/)**)**

This is the fifteenth year in which percentage cover estimations of macroalgae have been included as an element of the NMBAQC scheme and the thirteenth year for which seagrass has been assessed as a separate exercise. This module included one exercise for macroalgae and one for seagrass, both of which were split into three additional tests based on methodology. The format followed that established by Wells Marine during the previous years of the module (RT03 – RT12).

Eleven laboratories were issued test material. Nine laboratories completed the percentage cover macroalgae/seagrass module with a total of 33 participants. Of those laboratories submitting results, all but one were government organisations.

Results for percentage cover of both opportunist macroalgae and seagrass varied between participants and between the different methods used. Several results deviated from the sample mean and from the % cover as calculated by image analysis. Deviation from the latter was more noticeable and this has also been reported in previous years. There was a considerable lack of consistency between the three methods in terms of the degree of continuity between participants as well as how the data compared with the image analysis % cover. The range of results provided was higher this year than the previous year but was still consistent with results observed in earlier years of the percentage cover exercises.

For both the macroalgae and seagrass tests, method C was the most popular. In theory test method C should provide the least subjective method of estimation, as counting the number of crosshairs under which macroalgae or seagrass lay should be a relatively straight forward method. However, there is still a large disparity in results, often much higher than for the other test methods that may suggest the method is either not being used consistently between participants or that the use of an overlaid grid may obscure the photograph and make it more difficult to confirm whether there is algae/seagrass beneath. One of the participating laboratories observed that they found this method highly subjective between individuals and tended towards higher estimations of percentage cover than the open quadrat method.

The number of ‘Fails’ between test methods and comparison against mean or image analysis varied considerably with no apparent trend. The macroalgae results showed that for comparisons against the mean the number of fails was consistent for all three methodologies, whereas for the comparisons against ImageJ results, the number of fails was lowest for Test A and highest for Test C. The seagrass results had the lowest numbers of ‘fails’ for Test B and highest number for Tests A and C for comparisons against the mean and the highest number of fails for Test C and the lowest number of ‘fails’ for Test A for comparisons against the ImageJ results. The tests continue to produce a broad range of results thereby increasing the standard deviation, this results in the Z-scores being unable to pick up slight deviations from mean or ImageJ analysis percentage cover.

## Reports

[OMB RT15 Final Report 202](https://www.nmbaqcs.org/media/ri5kejw2/apem-report-omb-rt15-biomass-final.pdf)4

Pears, S. & Brackenreed-Johnston, G. 2024. National Marine Biological Analytical Quality Control Scheme. Macroalgae Biomass Component Report Ring Test OMB RT15 2024. Report to the NMBAQC Scheme participants. Apem Report NMBAQCmaomb15, 12pp, May 2024.

[OMC RT15 Final Report 202](https://www.nmbaqcs.org/media/2iqjocxy/apem-report-omc-rt15-percentage-final.pdf)4

Pears, S. & Brackenreed-Johnston, G. 2024. National Marine Biological Analytical Quality Control Scheme. Macroalgae/Angiosperm Percentage Cover Component Report Ring Test OMC RT15 2024. Report to the NMBAQC Scheme participants. Apem Report NMBAQCmaomc15, 18pp, May 2024.