

Chair Report on ISP Meeting 31

30th of April 2019

Project updates

- All contracts for the 2019 Report Card are in place (with the exception of Indigenous Cultural Heritage and Stewardship which are not being assessed this year).
- Projects are on schedule.
- The MC have requested that some changes to the Coral Coring report be considered
- The MC have requested that some changes to the two 2018 Fish Health reports be considered

ISP membership

Dr Nadine Marshall has resigned from the ISP because of family relocation overseas. The ISP Chair has begun searching for a replacement for the Social Science expert position.

Links between report card and management actions

The ISP discussed that there are currently no good links between the monitoring activities in the harbour and the potential changes in management. Ideally monitoring should be viewed as part of a Driver-Pressure-State-Impact-Response (DPSIR) process, where monitoring takes place to identify the State and Impact stages.

At present there does not appear to be any proactive actions discussed that might improve environmental conditions in the Gladstone Harbour. The ISP recommended that the GHHP Management Committee move towards more consideration of potential management actions, such as:

- using nets to avoid using fish spills over Awoonga Dam
- actions to reduce nutrient and sediments in the harbour, including from catchments.

Assessment of water quality parameters

Currently the GHHP water quality objective values are set at the 50th percentile value across the 13 zones. In a meeting with Jim Fewings and DES staff in December 2018, it was recommended that GHHP move towards assessment systems that aligned with the Queensland Water Quality Guidelines. Currently GHHP compares the mean value of the four observations at each site for each parameter to the 50th percentile of the water quality objective. The potential changes implied in the DES recommendations are summarised in Table 1.

The ISP has previously agreed to maintain the 50th percentile guideline values as water quality objectives and initiated investigations into how scores and grades would change if data was handled as outlined in the Queensland Water Quality Guidelines (Table 1).

Table 1. Percentiles of the test data to be used as the guideline value (DEHP 2009).

	MD zones	HEV zones
Phys/chem measures	Median of the data should be compared with 80 th percentile guideline value*	Test data should be compared with 20 th , 50 th and 80 th percentile guideline value
Toxicants	95 th percentile (95% species protection)	99 th percentile (99% species protection)

* Maintained as 50th percentile as per correspondence with DEHP

Activity

The science team completed three water quality comparisons which included:

1. Toxicants (metals in water) at all zones - 2018 scores (mean) compared to 95th percentile scores
2. Turbidity and nutrients at all zones - 2018 scores (mean) compared to median scores
3. Turbidity and nutrients at HEV zones - test data 20-50-80 values compared to DEHP 20-50-80 values

Median values were calculated as an aggregate median value for each zone. HEV zone comparisons were carried out as outlined by DEHP (See Appendix D.2.1 in DEHP, 2009). Toxicants at HEV zones were not compared with 99th percentile values considering data quality issues related to the confidence intervals.

Summary

Metals in water using 95th percentile values showed comparable results to 2018 scores at most zones except two, which showed considerable score drops. Dissolved copper scores were significantly lower (average score reduction of 0.44) using the 95th percentile value for each zone. Copper results should be viewed with caution considering the change in methodology (approved at ISP Meeting 30) regarding the handling of limit of reporting values.

Turbidity and nutrients showed marginal score improvements (0.08 to 0.12) when using the median instead of the mean values, except total nitrogen. Turbidity showed a whole harbour grade improvement from B to A. While there were 18 grade improvements in total (n = 52, 13 zones * 4 parameters), only three resulted in a change from a “failing grade” to a “passing grade”.

HEV zone comparisons of 20-50-80 values showed a mix of results which can be interpreted as follows:

- *Pass* indicates when the DEHP value falls within the upper and lower confidence intervals (CI) of the test data
- *Fail* indicates when the DEHP value falls below the upper and lower CI of the test data
- *Below Pass* indicates when the DEHP value lies above the upper and lower CI of the test data

Percentile results at each zone were mostly *Pass* and *Below Pass*, indicating that the measured data was consistent with or below the water quality guidelines.

Problems

However, changing to the approach consistent the Queensland Water Quality Guidelines is very problematic due to:

1. **Sample size inadequacy** - DEHP (2009) indicates a minimum of 24 samples. Only the Narrows (n = 24) has an adequate sample size at the zone level. Colosseum Inlet (n = 16) and Rodds Bay (n = 12) fall short of this requirement.
2. **Mixed results** - Of the 15 possibilities (3 zones * 5 parameters), there were 9 mixed results. This occurred when the 20th, 50th and 80th showed different results (e.g. *Pass, Fail, Pass*). DEHP (2009) provides no indication of how to interpret mixed results.
3. **Score conversion** - While results (*Pass, Fail, Below Pass*) are based on confidence intervals of the test data, it would be difficult to convert a report card score
4. **Consistency** – this would involve a major change in methodology where data from sites are pooled to only give zone scores, and would limit comparability to previous report cards.
5. **Timing** – DES have indicated that they will revisit the Port Curtis Water Quality Objectives, perhaps starting in late 2019. It would be preferable to have this completed before making changes to the GHHP assessment.

Recommendation

GHHP maintains its current water quality methodology. 95th percentile (metals) and median scores were largely consistent with 2018 scores and HEV zone comparisons (20-50-80) appear too problematic to validate the high cost and effort required for such an extensive change to the current methods. Additionally, the use of median or 95th percentile values is not advisable considering the generally small sample sizes for each zone, especially Graham Creek (n = 8) and Boyne Estuary (n = 4).

Aggregation of fish health scores for the 2019 report card

The ISP considered three main options to aggregate the new Fish Health measures (2 separate projects) with Fish Recruitment and Mud Crabs for the 2019 Report Card.

1. Score the new indicators separately then aggregate the scores from the four fish and crab projects (2 Fish health, 1 Fish recruitment, 1 Mudcrabs)
2. Score separately then aggregate the 2 new fish health project scores to a single fish health score before aggregating with crab and fish recruitment scores.
3. Aggregate common elements within the 2 fish health projects then add aggregated score to unique elements to produce a single fish health score.

The ISP recommended option 2 – to score the projects separately then aggregate the two new fish health project scores to a single fish health score before aggregating with crab and fish recruitment scores. Therefore, fish health, fish recruitment and crabs would contribute 33% each to the “fish and crabs” indicator score.

Benefits are that it is easy to calculate and explain to the general public, and that there is equal weighting of fish health, mud crabs and fish recruitment within the fish and crab indicator group.

Response to MC comments on Stage 2 Coral Coring and Fish Health Reports

The ISP reviewed the comments provided by the MC, and recommended that the different consultants (AIMS, CQU and InfoFish) be invited to respond.

Recommendation for changes to the Social, Cultural and Economic Indicator

The ISP recommended that:

- (a) the weightings that underpin the way that scores are amalgamated be updated in 2020 to be consistent with the original recommendation from Sean Pascoe (this will require additional survey work)
- (b) The CQU team collects 2019 survey data with the standard CATI survey (400 households) as well as a web-based survey for 170 households. This will test again if the web-based survey is a viable option. CQU will conduct both surveys as a part of the contract.
- (c) Two questions be added to the CATI survey questionnaire to gauge the level of awareness in the community of the report card and GHHP.
- (d) Data for tourism expenditure in Gladstone to now be sourced from the Tourism Research Australia database, as the previous source (economic model on the Gladstone Regional Council website) is no longer available.

Recommendation for changes to the names of the Social Indicators

As per recommendations by Dr Nadine Marshall, the ISP recommends changing the names of the indicators in the Sense of Place part of the Cultural component. This would make them easier for the community to understand. There would be no other change apart from the name. The list below provides the potential changes:

Current name	→	New name
• Distinctiveness	→	Place attachment
• Continuity	→	Continuity
• Self-esteem	→	Pride in the region
• Self-efficacy	→	Well-being
• Attitudes to Gladstone Harbour	→	Appreciation of the harbour
• Values of Gladstone Harbour	→	Values

Assessing nutrient and sediment inputs from catchments

The ISP discussed the potential to increase understanding of the inflows of fine sediments and nutrients to the Gladstone Harbour, as this may offer a potential management response to improve water quality. There is potential in the future for mapping or sediment and nutrient tracking to identify areas where reductions could be made.

The ISP recommends that the GHHP Science team compile a list of the available data sources from the Boyne and Calliope catchments as a preliminary step to identify what data is available to map sediment and nutrient inflows. The ISP will then invite an expert such as Dr Rebecca Bartley (CSIRO) or Dr Steve Lewis (JCU) for a brief discussion at the next ISP meeting. The ISP will then make recommendations to the MC about future options for improving knowledge in this area.