ENVIRONMENTAL

The environmental grade was determined from 24 measures, covering water and sediment quality, habitats (coral and seagrass) and fish and crabs (fish recruitment).

The fish and crab indicator has been added for the first time, although only fish recruitment (bream) was measured in 2016. Further fish and crab health indicators will be added to future report cards.

The GHHP Independent Science Panel and GHHP Science Team reviewed the data and its collection process to ensure scientific rigour. The data was then aggregated to determine the overall environmental health of the harbour. In addition to the overall harbour grade, each of the 13 harbour zones were graded individually.

From 2016, the connectivity indicator group will be reported separately and not part of the environmental component as in previous years. Connectivity was considered to be a system driver rather than a measure of environmental health.

CULTURAL

The cultural grade was determined by measuring people’s sense of place (six indicators) and cultural heritage of Gladstone Harbour (two indicators).

The sense of place indicators included perceptions of the intrinsic character of the harbour and the meanings people ascribe to it. Cultural heritage included a range of qualitative and quantitative measures related to spiritual, social and scientific value, physical condition and management strategies of Indigenous sites.

Social scientists, economists, anthropologists, archaeologists and statisticians from CSIRO, Central Queensland University and Terra Rosa Consulting were contracted to provide the required data, and the methodology and results were reviewed by the GHHP Independent Science Panel, Gidarjil Development Cooperation and GHHP Science Team. The data for sense of place was collected through a telephone survey of 401 local residents. Participants used a ten point agree-disagree scale to produce quantifiable results. Data for cultural heritage was collected through field surveys and a desktop study.
Grading, Confidence & Trends

Grades for this report card were calculated using 29 indicators derived from 95 different measures of the environmental, social, economic and cultural health of Gladstone Harbour. The components and indicator groups were graded A, B, C, D or E, based on the aggregated scores of the measures specific to each component.

Confidence levels for the component grades were measured on a three point scale. Low, medium and high levels were established to reflect the confidence of the ISP in the calculated grades. These confidence levels can be affected by (a) the completeness of indicators used and (b) quality of monitoring data.

Changes in grades for components from the 2015 to 2016 report cards are presented as improved, declined or unchanged.

For more detailed information on results refer to www.ghhp.org.au
SOCIAL

Social health of the harbour was assessed using three indicator groups: harbour access, harbour usability and liveability/wellbeing.

The assessment of the social health of Gladstone Harbour in 2016 was guided by social scientists and economists from Central Queensland University in collaboration with the GHHP Independent Science Panel and GHHP Science Team. The data was collected through a telephone survey of 401 local residents as well as information sourced from Maritime Safety Queensland.

The purpose of this component is to show how Gladstone Harbour contributes to the wellbeing and lifestyle of the local community.

### Key Observations

1. The inclusion of the Indigenous cultural heritage indicator group is a ground breaking development for waterway report cards. However, while the combination with the sense of place indicator group increased confidence in this component, overall the score was slightly lower than 2015.

2. As habitats continue to recover from the 2013 flood event, seagrass remained in a poor condition (D) and corals were in a very poor condition (E). This result is consistent with last year’s results and also inshore coral and seagrass results in the nearby Fitzroy region. Coral habitats are showing some potential for recovery based on juvenile recruitment results.

3. The confidence level on fish recruitment (bream species) scores is low because historical data is very limited; this indicator will become more robust because historical data is available in coming years.

4. In 2016, the economic performance improved from B (2015) to an A (2016). Amongst the measures leading to the improved grade were increased shipping activity and tourism scores. Commercial fishing declined from a C (2015) to a D (2016). However the scores between the years for commercial fishing are not directly comparable as a result of modifications to the Qfish database.

5. In 2016 the overall social grade improved from a C to a B. Amongst the measures leading to the improved grade were increased community perceptions of harbour health (air and water quality) determined from the community survey.

### SOCIAL RESULTS

<table>
<thead>
<tr>
<th>Indicator Group</th>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERALL SOCIAL RESULT</td>
<td>0.66</td>
<td>B</td>
</tr>
<tr>
<td>Harbour Access</td>
<td>0.65</td>
<td>B</td>
</tr>
<tr>
<td>- Satisfaction with access to the harbour</td>
<td>0.69</td>
<td>B</td>
</tr>
<tr>
<td>- Satisfaction with boat ramps &amp; public spaces</td>
<td>0.64</td>
<td>C</td>
</tr>
<tr>
<td>- Perceptions of harbour health</td>
<td>0.62</td>
<td>C</td>
</tr>
<tr>
<td>- Perceptions on barriers to access</td>
<td>0.65</td>
<td>B</td>
</tr>
<tr>
<td>Liveability / Wellbeing</td>
<td>0.66</td>
<td>B</td>
</tr>
<tr>
<td>Harbour Usability</td>
<td>0.66</td>
<td>B</td>
</tr>
<tr>
<td>- Satisfaction with harbour recreational activities</td>
<td>0.67</td>
<td>B</td>
</tr>
<tr>
<td>- Perceptions of air &amp; water quality</td>
<td>0.55</td>
<td>C</td>
</tr>
<tr>
<td>- Perceptions of harbour safety for human usage</td>
<td>0.76</td>
<td>B</td>
</tr>
</tbody>
</table>

### ECONOMIC RESULTS

<table>
<thead>
<tr>
<th>Indicator Group</th>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERALL ECONOMIC RESULT</td>
<td>0.75</td>
<td>B</td>
</tr>
<tr>
<td>Economic Performance</td>
<td>0.87</td>
<td>A</td>
</tr>
<tr>
<td>- Shipping activity</td>
<td>0.87</td>
<td>A</td>
</tr>
<tr>
<td>- Tourism</td>
<td>0.72</td>
<td>B</td>
</tr>
<tr>
<td>- Commercial fishing</td>
<td>0.43</td>
<td>D</td>
</tr>
<tr>
<td>Economic Value (Recreation)</td>
<td>0.73</td>
<td>B</td>
</tr>
<tr>
<td>- Land based recreation</td>
<td>0.76</td>
<td>B</td>
</tr>
<tr>
<td>- Recreational fishing</td>
<td>0.66</td>
<td>B</td>
</tr>
<tr>
<td>- Beach recreation</td>
<td>0.75</td>
<td>B</td>
</tr>
<tr>
<td>Economic Stimulus</td>
<td>0.74</td>
<td>B</td>
</tr>
<tr>
<td>- Employment</td>
<td>0.62</td>
<td>C</td>
</tr>
<tr>
<td>- Socio-economic status</td>
<td>0.80</td>
<td>B</td>
</tr>
</tbody>
</table>

ECONOMIC

Economic health of Gladstone Harbour was assessed by three indicator groups of economic performance, economic stimulus and economic value.

Economists and social scientists from Central Queensland University were contracted to provide the required data, guided by the GHHP Independent Science Panel and GHHP Science Team. The data was sourced from Gladstone Regional Council, the Australian Bureau of Statistics, Gladstone Ports Corporation, the Queensland Department of Agriculture and Fisheries, Queensland Government Statistician’s Office and Australian Bureau of Agricultural and Resource Economics and Sciences, as well as a telephone survey of 401 local residents.

The data provided by the above organisations comprises census data, unemployment statistics at the local government level for Queensland, turnover of harbour-based industries, monthly shipping movements, commercial fishing data and tourism data.
Stewardship

Stewardship is defined as ‘responsible planning and management actions’. The framework describes and evaluates environmental management efforts around and in Gladstone Harbour. It captures information on management efforts to maintain or improve harbour health and water quality. It is based on the nation-wide State of the Environment Report management effectiveness framework.

Stewardship is rated on a scale from ‘very effective’ through to ‘not effective’ based on a range of criteria covering administrative, operational and development activities during various management phases (planning, implementation and outcome).

INDUSTRY

There is a range of heavy industry activity on and around Gladstone Harbour, including LNG processing, alumina refining and aluminium smelting, cement and chemical manufacture, and Queensland’s largest coal-fired power station. These industries are highly regulated and have effective environmental practices in place to protect ecosystem health and water quality.

Overall, heavy industry stewardship in Gladstone Harbour was rated as effective. This was consistent across each of the management themes. The development activity group was rated as very effective.

PORT

There is only one port authority in Gladstone Harbour - Gladstone Ports Corporation (GPC). Several other companies, however, undertake activities that could be classified as ‘port activities’, namely ship loading/unloading, shipping and dredging. All activities undertaken by the port authority, as well as all dredging and shipping activities undertaken by any company, are included in the port stewardship framework.

Overall, port stewardship was scored as effective in planning and implementation and very effective in outcome. Across the activity groupings, administration, operations and shipping all scored effective. Development was assessed as very effective, noting that this was based on the outcomes of many small site upgrades, rather than large capital projects.

URBAN

Urban development within the Gladstone region is concentrated along the coastal zone. Urban land uses occur predominantly within Gladstone and small towns located inland and along the coast.

The overall result for urban stewardship in the Gladstone region was partially effective for the 2015-16 financial year. This rating was influenced by a low compliance rate from inspections of urban sites from Department of Environment and Heritage Protection officers. Planning was assessed to be very effective and the outcome assessed as effective.

CONNECTIVITY

The connectivity indicator group has been removed from the environmental component as, on reflection, connectivity was considered to be a system driver rather than a measure of environmental health. Connectivity will continue to be modelled and reported on.

Connectivity of water bodies is an important driver of productivity in marine ecosystems that helps to maintain ecosystem function. It contributes to the health of habitats found within Gladstone Harbour (such as seagrass beds, mangroves and coral reefs) by cycling nutrients, facilitating biological and genetic connectivity and diluting and flushing contaminants. However, connectivity between contaminant inputs and vulnerable habitats, such as between dredging activities and seagrass beds, can also have negative effects on harbour health.

The overall connectivity score in 2016 reporting was scored 0.61. This score was derived from modelled data for three connectivity indicators:

- Flushing rate (water exchange through the harbour);
- Contaminant connectivity (potential movement of contaminants from discharge points to other zones of the harbour); and
- Ecological connectivity (potential for larvae to move between spawning and nursery habitats within the harbour).

Flushing rates within the harbour were higher than the four-year baseline while ecological connectivity was lower than the baseline period. However, the middle and outer harbour scored well for ecological connectivity owing to their high potential for recruitment from other zones. Contaminant connectivity was very good in all zones except for Graham Creek, indicating a very low potential for any contaminant to spread throughout the harbour.

Compared to 2015 the flushing rate score declined slightly, ecological connectivity remained stable and contaminant connectivity has improved.

For the full Stewardship Report refer to www.ghhp.org.au
Acknowledgement of Country
The Gladstone Healthy Harbour Partnership acknowledges the traditional owners of the land and sea in the Port Curtis Coral Coast region, the Gurang, Gooreng Gooreng, Taribelang Bunda and Bailai people, and pays respect to the ancestors, the Elders both past and present, and to the people.

Communicating report card results

Distributing Report Cards
2,000 report cards distributed annually

Public Presentations
20+ professional presentations

3D harbour model displayed across the region

GHHP resources supporting education curriculum

Citizen Science Support
Supporting the community to understand testing and monitoring of harbour health. APPLY NOW.

5,000 storybooks in homes, schools & businesses

ALL RESOURCES AVAILABLE ON REQUEST
1800 241 254 or info@ghhp.org.au

www.ghhp.org.au

Acknowledgements
The Gladstone Harbour Report Card 2016 was produced with the support of our partners:

For more information please contact:
Gladstone Healthy Harbour Partnership
PO Box 3465 Tannum Sands Queensland 4680
info@ghhp.org.au  |  www.ghhp.org.au  |  1800 241 254

This publication may be used for research, individual study and educational purposes. Properly acknowledged quotations may be used, but queries regarding republication of any material must be addressed to GHHP.

Photo credits: GHHP and Natalia Muszkat Photography

Completion: December 2016