The information gathered on sediment transport regimes and the behaviour of sediment at ports can be used to identify probable maintenance dredging needs and requirements in the short and medium term. However due to the influence of major weather events on sedimentation, it is difficult to predict annual volumes.

6.1.4 Historic volumes

It is important to understand the historical maintenance dredging activities at each GBRWHA port as it can be used to provide an indication of both current and future needs.

A summary of historic maintenance dredging volumes at each GBRWHA port is presented in Table 4.

There is variability in the dredged areas that require maintenance dredging within each port, with different rates of siltation occurring at different areas of a port at different times. As a result of this spatial variability in siltation rates, it is common for maintenance dredging campaigns to target different areas in different years. As a result, volumes will vary accordingly.

Table 4 Historic in-situ maintenance dredging volumes (m^3) at the ports located within the GRBWHA

Year/Frequency	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Frequent Maintenance Dredging (annual) Natural processes result in high sediment transport rates in the vicinity of these ports, which, combined with the port configuration, result in regular siltation and therefore maintenance dredging is required annually to maintain design depths.											
Gladstone	174,150	148,426	225,242	160,972	17,995	282,000	0[1]	309,000	150,000	01	555,107
Townsville	492,740	312,785	156,560	117,454	339,306	675,464	133,100	814,435[2]	502,940	386,610	521,770
Cairns	531,962	387,346	378,554	228,105	201,864	312,807	314,657[3]	439,443[3]	246,727[4]	421,491[3]	574,447[3]
Regular Maintenance Dredging (dredging every two to five years) These areas experience relatively high rates of natural sediment transport but the dredged areas are not as effective sediment traps as the ports that require annual maintenance dredging. Additionally, the areas can be influenced by extreme events that may lead to the need for maintenance dredging frequency being increased.											
Hay Point	98,900	0	0	0	192,294	0	216,070	0	0[4]	0[4]	0[4]
Mackay	122,760	0	520	106,000	3,406	0	0	0	0	98,381	0
Infrequent Maintenance Dredging The local natural processes result in low sediment transport rates in the vicinity of the port, which combined with the naturally deep water where the port is located, results in infrequent maintenance dredging. Over the last thirty years maintenance dredging has been undertaken once, as part of a capital dredging campaign. Over this period a number of tropical cyclones have affected the area but these have not resulted in the requirement for maintenance dredging.											
Abbot Point	0	0	0	0	<20,000[5]	0	0	0	0	0	0
Episodic Maintenance Dredging The siltation associated with maintenance dredging at these ports results from episodic extreme events such as large floods and tropical cyclones. It is not possible to predict the frequency of these events, they could occur in consecutive years or only every few decades.											
Port Alma	0	0	0	0	0	23,000	0	40,000	0	0	0
Cooktown[6]	0	0	0	0	0	0	0	0	0	0	0
No Maintenance Dredging The configuration of these ports have meant that maintenance dredging is not required regardless of the natural siltation rates. At the Port of Lucinda and the Port of Cape Flattery this is because the berths are located in deep water, while at the Port of Quintell Beach it is because the port only consists of a barge ramp that does not require an access channel.											
Cape Flattery, Quintell Beach, Lucinda, Mourilyan	0	0	0	0	0	0	0	0	0	0	0

1. The years with no maintenance dredging in the Port of Gladstone are due to the timing of the dredging program, instead of dredging occurring towards the end of the year it occurred at the start of the following year.
2. The maintenance dredging volumes for the Port of Townsville in 2011 appear very high as the maintenance campaign was interrupted by TC Yasi, which subsequently silted up the channels and berths requiring additional maintenance dredging.
3. At the Port of Cairns since 2010 it has not been possible to achieve the maintenance dredging target depths due to technical specification reasons.
4. Further maintenance dredging at the Port of Hay Point is currently the subject of a sustainable sediment management project looking to find the best ways to manage sediment at the port (similar activities are underway in other ports).
5. At the Abbot Point Port capital dredging of 201,315m3 to create a new berth as well as maintenance dredging of the existing berth occurred in 2008, this was the first time any maintenance had occurred since 1986. An exact maintenance dredging volume is not available but the volume was estimated to be less than 20,000m3 (GHD, 2012a).
6. Cooktown has required maintenance dredging of 44,141m3 in 2015 and 26,000m3 in 1996 due to tropical cyclones.