

June 2009 - SR Pearce

Monitoring Report – Poole Harbour

2008

The bed levels (bathymetry) of Poole Harbour and the approaches are continually monitored for change in elevation as part of Poole Harbour Commissioners (PHC) Bathymetric Monitoring Programme. The baseline for all depth comparisons is the 2005 report, covering 1849-2004; this was updated in 2007 as a result of the monitoring requirements of the Channel Deepening EIA, and will be continue to be updated as appropriate.

Since the 2007 report, the bathymetric monitoring programme has covered a number of areas surrounding the dredged channels, these have been compared with previous surveys and any changes recorded. It must be remembered that there is a degree of background change that is ongoing and the purpose of this report is to identify the existence or not, of significant alteration to this background change.

When looking at depth changes it is essential to be aware of the limits of accuracy of the survey method. These surveys were conducted using high frequency Sonar at 200 KHz to measure depth and DGPS/RTK for position. Water elevation was recorded from remote locations using tide gauges and in more recent years using RTK GPS. The practical achievable accuracy for this type of survey is generally better than: in the horizontal plane +/- 1m and in the vertical +/- 0.1m, and to a few centimetres in ideal conditions. In the following text the term 'small' means a few centimetres (ie less than 0.1m) and 'significant' means reliably recorded on a number of surveys and greater than 0.1-0.2m.

It must be remembered that the predicted difference in depths referred to in the Impact Assessment are often beyond the limit of the survey method accuracy and further monitoring will be necessary to confirm trends. Also many of the small changes could be seasonally or even tidally driven and cyclic in nature. Therefore assumption cannot be made on one comparison only.

All of the changes in elevation to the seabed that are detailed here are unlikely to be noticeable by the harbour user. Localised changes around hard structures: seawalls, jetties, and drying mobile sand spits, are however noticeable by the user but are not necessarily indicative of changes throughout the expanse of the harbour. This said, observations of an anecdotal nature are interesting and can sometimes be useful if investigated scientifically.

The following comparisons have been made by creating a 3D computer model of each survey then overlaying and subtracting one model from the other. The resulting depth differences are then colour coded to show visually the areas of change, red depicting shoaling and blue depicting deepening.

The survey areas covered by this report are as follows:

- Backwater Channel
- Baiter
- Between the quays
- Blood Alley
- Chapmans Peak
- East Looe
- Havens
- Holes Bay
- Middle Channel
- Middle Mud
- Parkstone Bay including Blue Lagoon
- Ramshorn Lake
- Redhorn Lake
- South Deep West
- Shell Bay
- Stone Island Lake
- Swash Channel
- Turning Basin
- Wareham Channel
- Whitley Lake
- Wych Channel Middle
- Wych Channel Lower
- North Channel and Middle Ground

Areas not yet covered since the previous report will be surveyed as the programme progresses and will be reported in the next report.

- Hook Sands
- Rockley Channel
- South Deep East
- Wych Channel Upper
- Brownsea East

Comparisons by area: Project S:\HYPACK\monitoring report 2008-2009

Depth/sounding differences:

Backwater Channel (Dec 2005 to July 2008).

Little change in depth throughout the main run of the channel but with continued minor shoaling in the eastern corner and around the bend, in the vicinity of the larger moored barges. This is in line with the existing trend for this location.

Baiter (Nov 2003 to Dec 2008).

No significant change

Blood Alley (Dec 2002 to Feb 2008)

No significant change but some indication of loss to the east and gain to the west.

Chapman's Peak (March 2005 to Dec 2008).

Numerous variations in level, this is a very mobile area and variations in levels are usual. The general shape and location of Chapman's Peak remains constant between these surveys.

East Looe (April 2005 to Dec 2008)

The 'old' East Looe Channel, between what was Number 16 Buoy and Sandbanks beach had previously shoaled and remains closed and the 'new' route west is stable. It is worth remembering that the 'new route' is in fact the previous (pre 1980's) route that was marked by a sector light in the garden of a property on Panorama Road (see admiralty chart 2611 of this period). The bed levels in East Looe are very changeable but the trend is in line with previous years.

Havens (Aug 2005 to Aug 2008)

This comparison indicates some minor deepening throughout the area. This survey is repeated annually and further comparisons will be made in due course.

Holes Bay (May 2004 to July 2008)

Very little change, but some indication of the continuing trend of siltation of the channels and loss of the surrounding mud flats.

Middle Channel (July 2005 to Dec 2008)

There has been little change to the rates of infill throughout the length of Middle Channel with the usual sections showing steady accretion, namely Aunt Betty to 24 Buoy. There has been some deepening on the bend opposite Aunt Betty in line with previous trends.

Little Channel, New Quay and Working Quays (Jan 2005 to July 2008)

There is some shoaling within the dredged areas, as would be expected.

Middle Mud (Sept 2006 to March 2009)

No significant change in depth but possibly some indication of slight deepening.

North Channel and Middle Ground (Dec 2005 to March 2009)

Changes in line with previous trends: some deepening is evident across Middle Ground in the Rum Row area and there is accretion in the channel, more evident in the in the western half of the channel.

Parkstone Bay (Oct 2002 to Oct 2008)

No significant change in depth but with some indication of deepening in line with previous trends.

Ramshorn Lake (Feb 2002 to May 2008)

Continued shoaling of the channel with some loss to the surrounding flats in line with previous trends.

Redhorn Lake (July 2003 to Sept 2008)

No significant change in depth or alignment.

South Deep West (Feb 2002 to May 2008)

Working clockwise around Green Island starting south west of Furzey slip: there is no significant change in depth until you pass the BP water inlet, but some accretion is evident in the channel and this is in line with the previously identified trend. The stretch of channel north of the BP inlet has shoaled by up to 0.5m in places for approximately 500m to where it meets the Ramshorn Channel. The comparison previously made for this area (1995-2002) also showed significant shoaling in this section of channel combined with loss of material from the surrounding flats. The loss from the flats is more evident in the 2002-2008 comparison on the west side of the channel where there has been continuing dieback of the saltings. The dieback of saltings is quite extensive throughout the South Deep area.

Stone Island Lake (July 2003 to June 2008)

No significant change in bed levels but some deepening is indicated throughout the area and is more evident in the north east part; again, this is in line with previous comparisons.

Swash Channel (Sept 2006 to Dec 2008)

Depth differences are in line with previous comparisons but with some evidence of deepening, and to a lesser extent shoaling, in the deeper north sections, more evident on the Hook Sands side of the channel. The area of Hook Sands to the east of the Swash is very mobile.

Turning Basin (July 2005 to April 2009).

There has been a continual build up of sediment around the edges and on the side slopes of the basin in line with previous comparisons, and some minor dredging has been undertaken here by the CH Horn. This is historically one of the fastest accreting areas of silty material within the dredged channels of the harbour.

Wareham Channel (Oct 2005 to Oct 2008)

No significant changes in level, some indication of the continuing trend of loss of material from the flats and slight accretion in some parts of the channel but with some sections showing no change at all. There does appear to be two shallow areas that have an indication of accretion: the small embayment between Russell Quay and the Boundary Stone, and to the south of Rockley Channel.

Whitley Lake (Sept 2005 to Sept 2008)

No significant changes but with some indication of slight deepening throughout the area.

Middle Wych Channel (Oct 2004 to Nov 2008)

No significant changes.

Lower Wych Channel (Sept 2006 to April 2009)

Continuing indication of slight deepening outside of the channel and accretion in the channel.

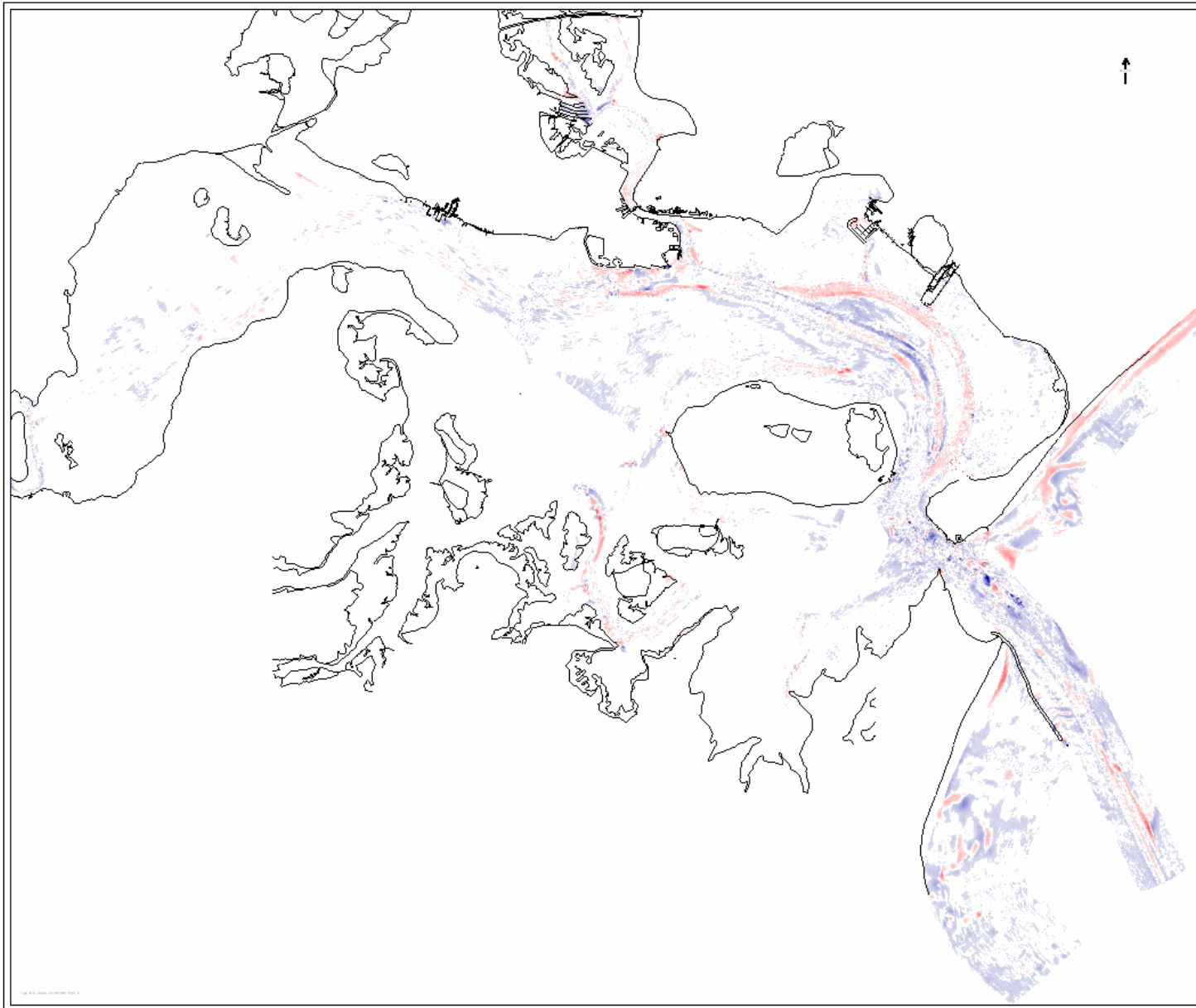
Studland and Shell Bay (2005 to 2008)

Little change with some accretion to the north section of beach.

See Channel Coast Observatory 2008 Annual Survey Report (Hengistbury Head to Durlston Head) available at www.channelcoast.org

PHC Monitoring Survey Programme

Survey Area	Frequency (months)
Backwater Channel	24
Baiter	24
Between the Quays	12
Blood Alley	36
Brownsea East	24
Chapman's Peak	4
Dolphin Haven	12
Dump Ground	12
East Looe	6
Havens	12
Holes Bay	36
Hook Sands	24
Little Channel \ Working Quays	6
Middle Channel (East)	4
Middle Ground	24
Middle Mud	12
North Channel	12
Parkstone Bay	24
Ramshorn Lake	24
Redhorn Lake	36
Ro/Ro's	4
Rockley Channel	24
Shell Bay	12
South Deep East \ White Ground	24
South Deep West	36
Stone Island Lake	36
Swash Channel (North)	4
Swash Channel (South)	4
Turning Basin and MSCW	4
Wareham Channel (Lower)	36
Wareham Channel (Middle)	36
Wareham Channel (Upper)	36
Whitley Lake	24
Wills Cut	24
Wych Channel (Lower)	24
Wych Channel (Middle)	36
Wych Channel (Upper)	36



Depth difference Poole Harbour 2006-2008/9 (nominal) to +/-0.08 tolerance Red accretion Blue deepening..

Conclusions

The depth changes to 2008/9 throughout the harbour covered by PHC surveys, conducted since the channel deepening of 2005-06, show no significant differences to the background trends, as measured by previous surveys.

The figure gives the best picture of depth changes throughout the surveyed area, being unlikely to show differences outside the limits of reliable measurement using a $\pm 0.08\text{m}$ tolerance (meaning any differences of $+0.08\text{m}$ or -0.08m from the original measurement have been ignored).

Any small changes will be examined and compared with future monitoring surveys.

In addition to the bathymetric data, lidar data covering the more inaccessible shallow areas of the harbour is now available on a five year cycle and this will be utilised and compared for areas not covered by bathymetric data. The reliability of this lidar data has improved in recent years. It is going to be a useful addition to the current method but must still be treated with some caution.