



Poole Harbour Commissioners

**Bed Level Monitoring Report
Poole Harbour
12/06/07**

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Bed Level Monitoring Report – Poole Harbour **2007**

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 last reported 2005 covering 1849-2004 which forms the baseline for all depth comparisons.

Since the channel deepening of 2005-2006 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 any 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 200 KHz to measure depth and DGPS for position. Water elevation was recorded from remote locations using tide gauges. The practical achievable accuracy for this type of surveys is as follows: in the horizontal plane +/- 1m and in the vertical plane +/- 0.1m but generally better, and to a few centimetres in ideal conditions. In the following text the term 'small' means a few centimetres (i.e. less than 0.1m) and 'significant' means greater than 0.1m.

It must be remembered that the predicted difference in depths referred to in the Impact Statement are on 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. Therefore make an assumptions 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 however are noticeable but are not indicative of changes throughout the expanse of the harbour.

The following comparisons have been made by creating a computer model of each survey and subtracting one from the other and then colouring the areas of change.

The survey areas covered were as follows:

- Between the quays
- Baiter
- Brownsea East
- Chapmans Peak
- East Looe
- Hook Sands
- Middle Channel
- Middle Ground
- Middle Mud
- North Channel
- Parkstone Bay
- Rockley Channel
- South Deep East
- Swash Channel
- Turning Basin
- Wych Channel lower
- Wych Channel Upper

Areas not yet covered since the Channel Deepening will be surveyed as the programme progresses, are:

- o Whitley Lake
- o Wareham Channel
- o The Havens
- o South-deep West
- o Rams-horn and Redhorn

Comparisons by area :

Depth differences: **Between the quays-Little channel New Quay and working Quays**. Jan 2005, June 2006 and Feb 2007

There was a localised build up of silt along Bulwark, Ballast and New Quays during the dredging of little channel, resulting in faster accumulative rate than in previous years; however dredging has been less frequent contributing to this build up. The southern part of Little Channel has siltation to 0.3m above the final dredged bottom. The West end of town quay also shows some shoaling along side: inline with pre channel deepening trends.

Depth differences: **Baiter** (November 2003 – September 2006)
Some minor siltation across the oyster bank is evident from comparing these 2 surveys.

Depth difference: **Brownsea east** 2003-2007
Little change to depths in this area but to the north where previously there were signs of accretion there now appears to be a small loss, however there is now accretion to the south.

Depth differences: **Chapmans Peak** March 2005 March 2007
The isolated shoal patch in the centre of the peak has shallowed but the surrounding bed has lost a little material

Depth differences: **East Looe** April 2005 Nov 2006 April 2007
The old East Looe channel, between what was number 16buoy and Sandbanks beach has now closed up and the new route west is stable. The beach has remained to the west but there is some loss further west. Changes in East Looe are as would be expected and in line with previous years.

Depth differences: **Hook Sands** Sept 2004 - April 2007
The depth changes across the Hook sands between these 2 surveys are in line with previous year's changes, there is little significant change in depth with the exception of the drying areas which have shifted location a little. These drying banks probably move regularly especially in periods of bad weather

Depth differences: **Middle Ground** March 2004-October 2006
There is evidence of some minor shoaling at either end of Middle Sands but with a deepening of the centre section, in line with the historic trend.

Depth Difference **North Channel** Dec 2005 - October 2006
There is a small increase in accretion throughout the length of North Channel.

Depth Difference: **Middle Channel**
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.

Depth Difference: **Middle Mud**
There is no measurable change in depth between surveys across Middle Mud

Depth differences: **Parkstone Bay**
Previous comparisons show a progressive loss of material throughout the bay but this more recent comparison suggests a more stable situation with a little accretion in

the southern part of the bay, it must be remembered that the suggested difference in depths is on the limit of the survey method accuracy and further surveys would be necessary to confirm a trend.

Depth differences **Rockley Channel** 2003 - Feb 2007

The differences in depth between these 2 surveys show a small decrease in depth throughout the channel

Depth differences **South Deep East** April 2007

Changes are in line with the previously measured trend with some loss to the areas surrounding the channel and accretion in the channel.

Depth Differences **Swash Channel** Sept 2006 – Jan 2007

Depth differences are in line with previous comparisons but the rate of accretion was perhaps a little less than expected.

Depth differences **Turning Basin**

There has been appreciable build up of sediment around the edges and on the side slopes of the basin much as would be expected due to its lower elevation making it a natural sink This is one of the fastest accreting areas of silty material within the dredged channels of the harbour.

Depth differences **Wych Lower** 2005-2006

There are small changes in depth with signs of shoaling in the channel and deepening of the surrounding area in line with previous comparisons.

Depth differences **Wych Upper** 2001-2006

There are small changes in depth with signs of shoaling in the channel and deepening of the surrounding area in line with previous comparisons. However the section of channel in the approach to Round Island pier shows signs of localised deepening

PHC Monitoring Survey Programme

Survey Area	Frequency month
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 Channelworking Quays	6
Middle Channel (East)	4
Middle Ground	24
Middle Mud	12
North Channel	12
Parkstone Bay	24
Ramshorn Lake	24
Red Horn Lake	36
Ro/Ros	4
Rockley Channel	24
Shell Bay	12
South Deep East/White Gnd	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

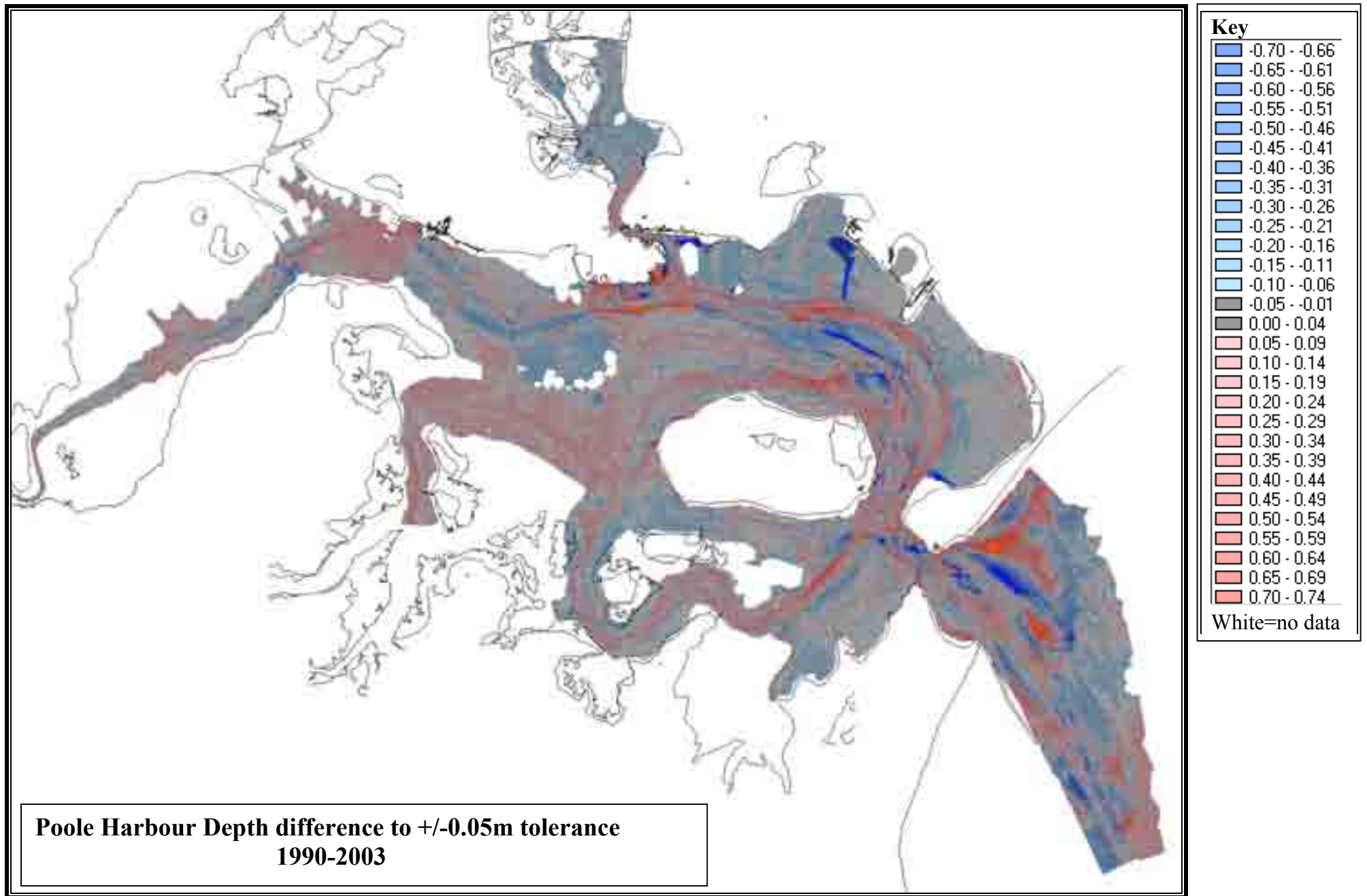


Figure 1. Depth difference Poole Harbour 1990-2003 to +/- 0.05 tolerances (taken from 2005 bathymetric monitoring project).

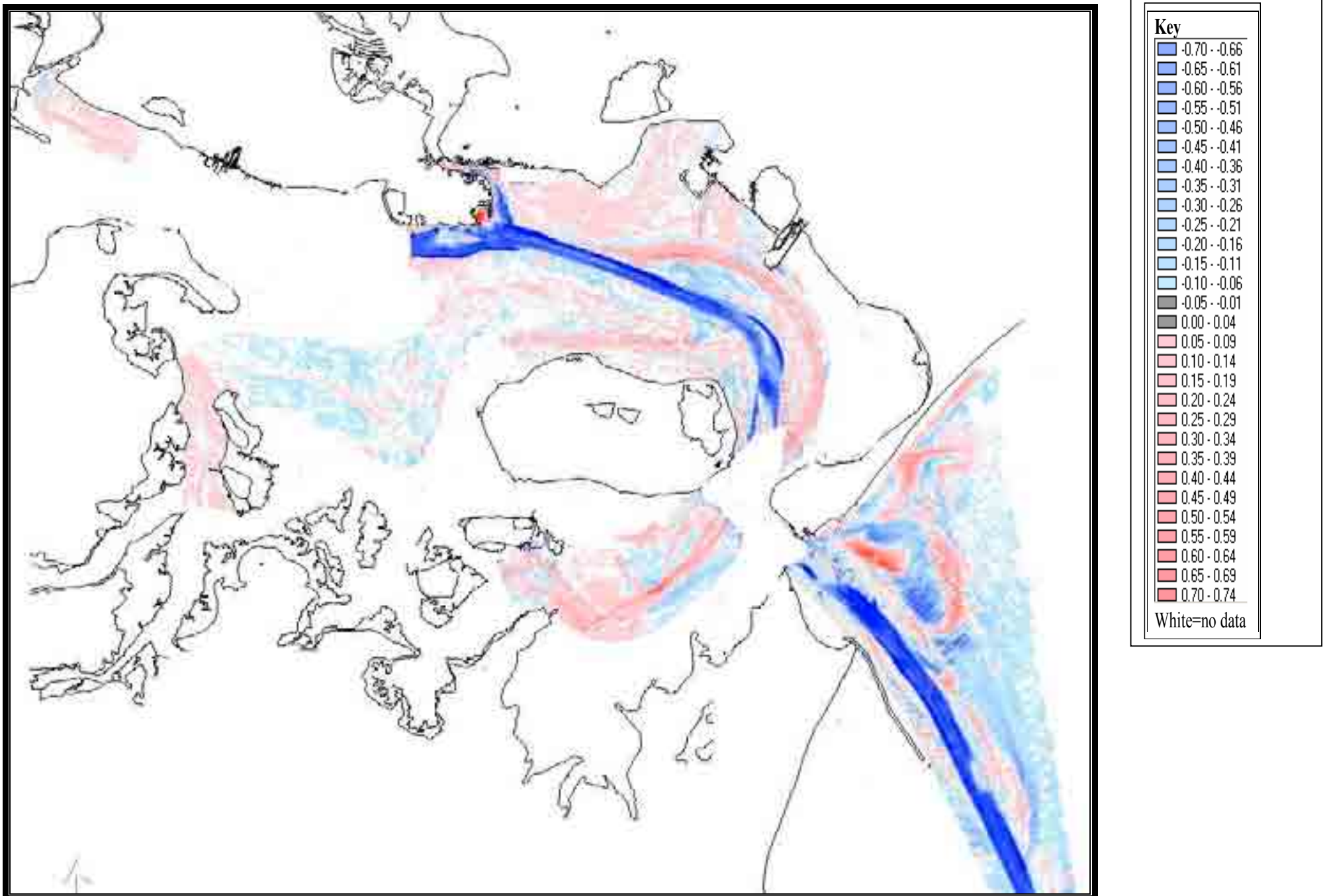


Figure 2. Depth difference Poole Harbour 2003-2007 to +/-0.05 tolerance

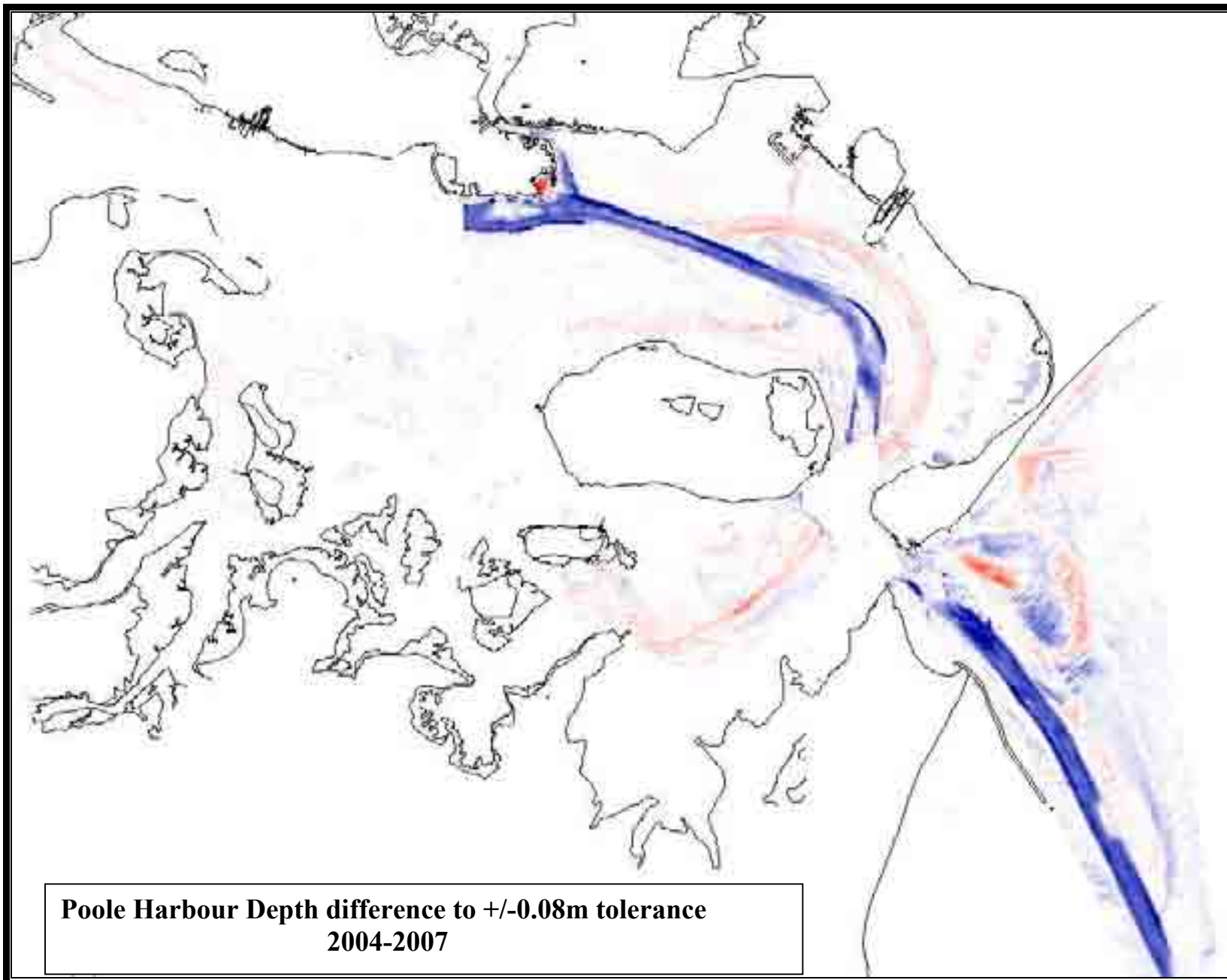


Figure 3. Depth difference Poole Harbour 2003-2007 to +/-0.08 tolerance

Conclusions

The depth changes 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 figures give the best picture of depth changes throughout the surveyed area including the material removed from the channels. Figure 3 is the most reliable being less likely to show differences outside the limits of reliable measurement using a +/- 0.08m tolerance (meaning any differences of +0.08m or -0.08m from the original measurement have been ignored).

Any accretion within the dredged footprint is not shown in the figures as the overall difference to the original is obviously deepening.

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