

## The active dredge area

In addition to the figures for licensed area and dredged area, the total area actually available to be dredged during 2001 (active dredge area) has been included in the table below.

Area of seabed licensed/available/dredged (km<sup>2</sup>) by region, 2001 (from EMS Block Analysis)

region	total area licensed (km <sup>2</sup> ) at 01/01/02	total active dredge area for 2001 (km <sup>2</sup> )	total area dredged (km <sup>2</sup> )	area dredged >5hrs (km <sup>2</sup> )
Humber	578.92	310.72	28.35	1.69
East Coast	319.00	244.48	78.71	6.10
Thames (*1)	155.69	189.62	17.54	0.12
South Coast	209.05	154.72	31.72	3.80
South West	52.34	52.34	12.71	1.26
North West	97.91	20.52	4.01	0.29
Total (km <sup>2</sup> )	1412.91	978.51	173.04	13.26

\*1 Total active dredge area greater than the total area licensed at 01/01/02 as a result of area surrendered during 2001.

The area licensed does not necessarily represent the area available to be dredged – the active dredge area.

Many licences minimise the area available to be dredged at any one time through zoning schemes. These reduce the extent of the environmental impact of dredging operations, as well as aiding the management of the sand and gravel resource and fisheries liaison. The Crown Estate's Electronic Monitoring System is used to monitor these defined zones.

At both national and regional scales, the total active dredge area can therefore be significantly less than the total area licensed. For 2001 this represented about 70% of the area licensed nationally.

Figures for the active dredge area have been calculated on a cumulative basis. This ensures that the total for 2001 incorporates any changes in individual zoning plans that may have occurred during the year. As such, the figures do not represent the total area available to be dredged at any one time, rather the total area that was available during the whole of 2001, incorporating all changes or modifications that took place.

### Area of seabed licensed has decreased during 2001

Area of seabed licensed (km<sup>2</sup>), 1998-2002

Year	1998	1999	2000	2001	01/01/02	Change 01 / 02
0-6nm	875	704	695	663	616	-47
6-12nm	514	504	420	454	408	-46
>12nm	273	259	256	389	389	0
Total (km <sup>2</sup> )	1662	1467	1371	1506	1413	-93

### Area of seabed dredged has remained stable during 2001

Area of seabed dredged (km<sup>2</sup>), 1998-2001 (from EMS Block Analysis)

Year	1998	1999	2000	2001	Change 00 / 01
0-6nm	136	112	88	84	-4
6-12nm	96	94	71	64	-7
>12nm	26	32	20	25	5
Total (km <sup>2</sup> )	258	238	179	173	-6

### A new initiative for 2002

Recognising the need to provide clear and up-to-date information on zoning plans for individual licence areas, The Crown Estate and BMAPA will provide information on the active dredge area by region, on a six-monthly basis.

Regional chartlets will be produced twice a year (January and July), detailing the current extent of the active dredge area, with up-to-date co-ordinates for individual licences on the reverse. This information will be circulated widely and made available on both The Crown Estate and BMAPA websites.

Operating companies will still be responsible for notification of individual changes.

### >5 hours

The area dredged for >5 hours identifies the most intensively dredged areas based on hours of dredging/year within individual 100m by 100m blocks.

Analysis has demonstrated that the total area dredged for >5 hours represents over 90% of the dredging recorded for the year.

## Background

Dredging offshore for aggregates began in the early Twentieth Century but it did not reach a significant scale until the 1970's, as markets for marine aggregates expanded and dredging technology improved. Almost all marine aggregate extraction takes place from licences on seabed owned by the Crown Estate. Planning permission is granted by the Office of the Deputy Prime Minister or the National Assembly for Wales/Scottish Office under the Government View Procedure. The Crown Estate will only grant a licence following a favourable Government View.

## The Crown Estate

The Crown Estate is a landed estate including more than 120,000 hectares of agricultural land in England, Scotland and Wales, substantial blocks of commercial property (primarily in London) and an extensive marine estate covering 55% of the foreshore and all of the seabed out to the 12 mile territorial limit. The Crown Estate is part of the hereditary possessions of the Sovereign "in right of the Crown" managed under the provisions of the Crown Estate Act 1961 by the Crown Estate Commissioners who have a duty to maintain and enhance the value of the Estate and the income derived from it. The net revenue surplus is paid to the exchequer.

## BMAPA

The British Marine Aggregate Producers Association (BMAPA) was formed in 1992 and comprises members of the Quarry Products Association with a marine interest. Marine sand and gravel is supplied to home markets, as well as contributing to the balance of payments through exports to Continental Europe. In addition, marine aggregates are fulfilling an increasingly important role by supporting beach replenishment schemes. The marine aggregates industry operates over 30 vessels on 72 production licences around the UK. The vessels are almost entirely British registered and carry British crew.

BMAPA membership is comprised of: Britannia Aggregates Ltd, British Dredging Ltd, Hanson Aggregates Marine Ltd, Kendall Bros. (Portsmouth) Ltd, Northwood (Fareham) Ltd, Norwest Sand and Ballast Company, South Coast Shipping Company Ltd, and United Marine Dredging Ltd.



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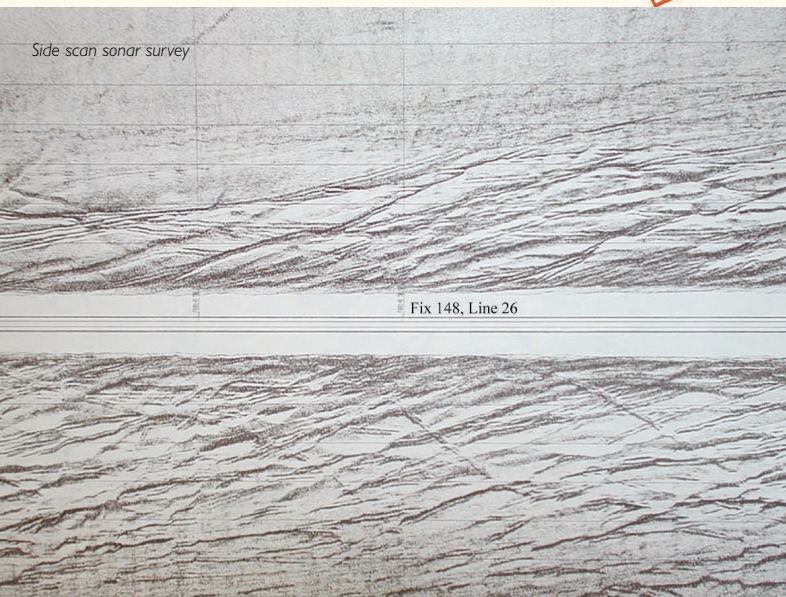
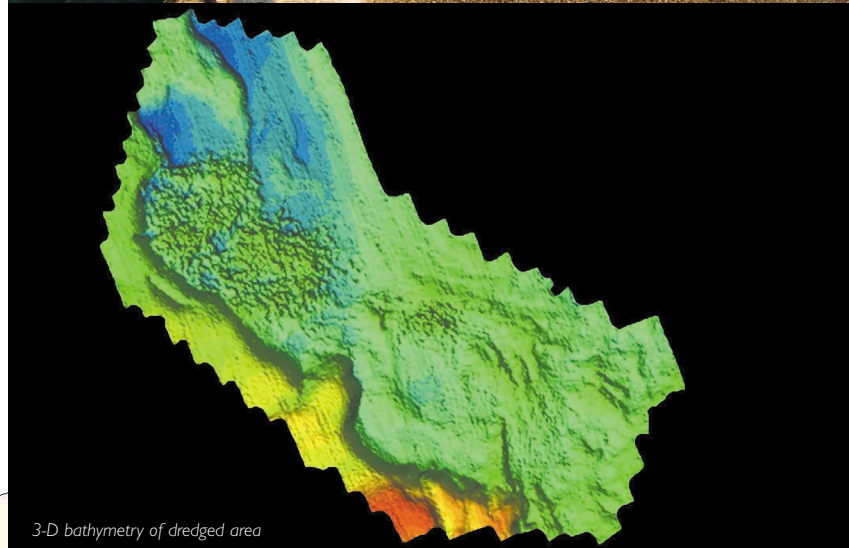
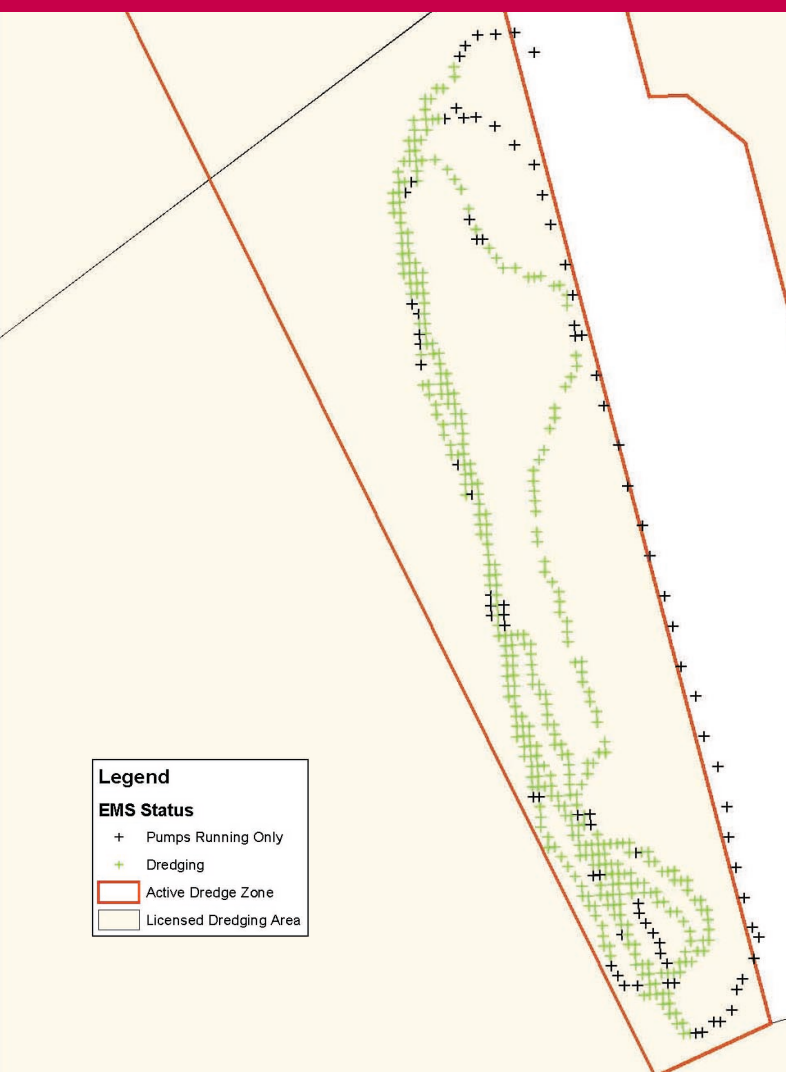


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## MARINE AGGREGATE DREDGING

### THE AREA INVOLVED – 4th ANNUAL REPORT





## An industry committed to responsible management through continual development

*In March 1999 The Crown Estate and the British Marine Aggregate Producers Association (BMAPA) issued a statement of intent committing themselves to reviewing all licences over a rolling five year period, surrendering areas no longer containing useful resources of sand and gravel and publishing an annual report detailing the extent of dredging within licensed areas.*

*This year's report is the fourth in an ongoing series, and its content reflects the continual development of this initiative by both The Crown Estate and the members of BMAPA.*

As well as summary information on the area of seabed licensed, dredged and surrendered during 2001, this year's report also introduces two new developments;

- Variable grid cell analysis
- Active dredge area

Variable grid cells allow a more detailed analysis of dredged area and intensity with a fourfold increase in resolution.

As in previous reports, national and regional area dredged statistics have been calculated using block analysis (100m by 100m blocks). However, the regional chartlets depicting the extent and intensity of dredging activity are now derived from the new variable grid analysis (50m by 50m cells).

Next year's report will update historical dredging statistics from 1998 onwards, using the new variable grid cell analysis. The workload for this analysis was too large in the time available for this report.

The development of variable grid analysis does not affect the figures provided for the area licensed and surrendered.

### Summary information

- A total of 22.76 million tonnes of sand and gravel were dredged from Crown Estate licences in England & Wales during 2001.  
(2000 – 23.05 million tonnes)
- The total area of seabed licensed in 2001 decreased to 1413km<sup>2</sup>.  
(2000 – 1506km<sup>2</sup>)
- The area of seabed dredged during 2001 decreased slightly to 173km<sup>2</sup> (block analysis).  
(2000 – 179km<sup>2</sup>)
- Over 90% of dredging from Crown Estate licences took place from an area of 13.26km<sup>2</sup>.  
(2000 – 11.89km<sup>2</sup>)

# Variable grid cell analysis

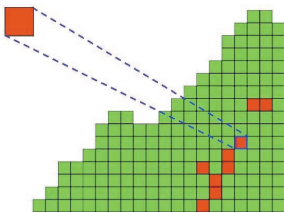
The Crown Estate's Electronic Monitoring System (EMS) provides accurate data on dredging activity, from which the annual extent and intensity of dredging activity can be determined. In previous years, these calculations were based on dredging records within 100m by 100m blocks, with the number of blocks within each licence area then being interpreted manually (figure 1).

The Crown Estate has developed a new variable grid cell method of analysis using a computer-based Geographical Information System. This approach uses smaller 50m by 50m cells in place of the old blocks, which in turn improves the resolution of dredging activity fourfold, as illustrated by figure 2.

The increased resolution provided by grid cell analysis has meant that the scaling of dredging intensity has also had to be altered. Within the 100m by 100m blocks, data was presented using  $\leq$  5 hours to differentiate levels of dredging activity. For the smaller 50m by 50m cells, a figure of  $>1.25$  hours (1 hour 15 minutes) has been used – effectively one quarter of the 5 hour figure used for the larger block. Additionally, a further measure of  $\leq 0.25$  hours (15 minutes) has been included, to allow areas that have been subject to the least intensive dredging activity throughout the year to be identified (figure 3).

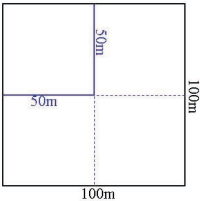
Where activity is more concentrated the improved resolution provided by grid cell analysis coupled with the new scaling will highlight the most intensively dredged area. Conversely within areas where less intensive dredging occurs, the increased resolution will show areas of un-dredged seabed within production licences.

Figure 1 Block Analysis



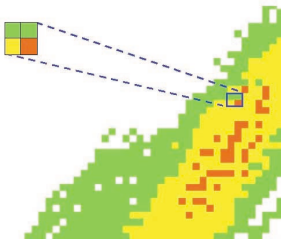
A 100m by 100m area provides a single block for analysis. Intensity is presented as either  $>5$  hours or  $\leq 5$  hours.

Figure 2 Comparison of blocks and grid cell sizes



The use of grid cells of 50m by 50m increases the resolution of analysis by fourfold over block analysis.

Figure 3 Variable Grid Cell Analysis



A 100m by 100m area now provides 4 cells for analysis: effectively improving the resolution of dredging activity through smaller grid cells and the use of low ( $\leq 0.25$  hours), medium (0.25-1.25 hours) and high ( $>1.25$  hours) measures of dredging intensity.

Improved resolution in the extent of dredging activities can be demonstrated through a comparison between the block and grid analysis of EMS data for the year 2001.

Total Area of Seabed Dredged 2001 (Block Analysis vs Variable Grid Cells)

Region	Block Analysis (100m by 100m) Total area dredged (km <sup>2</sup> )	Variable Grid (50m by 50m) Total area dredged (km <sup>2</sup> )	Difference in area (km <sup>2</sup> )
Humber	28.35	21.96	-6.39
East Coast	78.71	63.63	-15.08
Thames	17.54	19.90	2.36*
South Coast	31.72	33.28	1.56*
South West	12.71	9.75	-2.96
North West	4.01	2.07	-1.94
Total	173.04	150.59	-22.45

\* Inconsistencies caused by manual interpretation

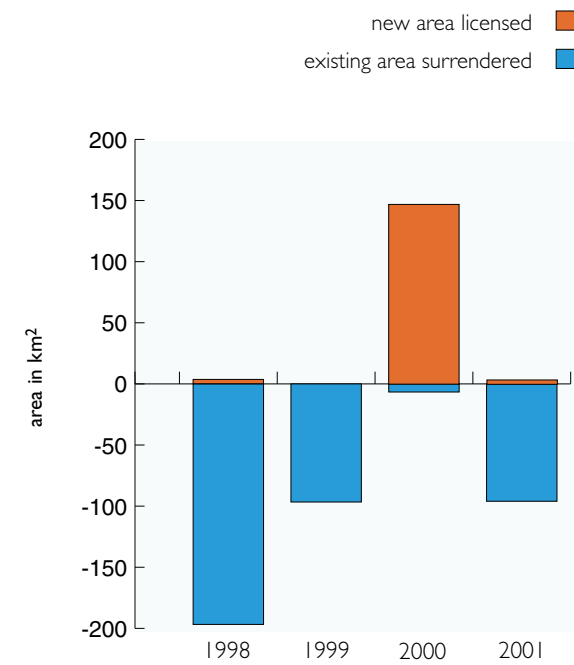
Regional chartlets

As in previous years, the information for area licensed, dredged and surrendered has been broken down by distance offshore, using 0-6 nautical miles (nm), 6-12 nautical miles (nm) and >12 nautical miles (nm). In response to comments received after last year's report, the 6 and 12 nautical mile (nm) limits are displayed on each regional chartlet.

Dredging intensity data for 2001 has been prepared using grid analysis (50m by 50m cells) rather than the previously employed block analysis (100m by 100m blocks). Annual dredging intensity is now presented as either being **high** (>1.25 hours; effectively equivalent to >5 hours), **medium** (0.25 hours to 1.25 hours) or **low** (<0.25 hours).

The regional statistics for area dredged presented on the reverse of each chartlet are based upon the block analysis technique (100m by 100m blocks) that has been used in the previous three reports.

New area licensed v. existing area surrendered 1998-2001



Area of seabed licensed and dredged 1998-2001

