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**Figure 3.2.27 Macoma balthica (9-20mm) distribution 1998 compared to 1999**

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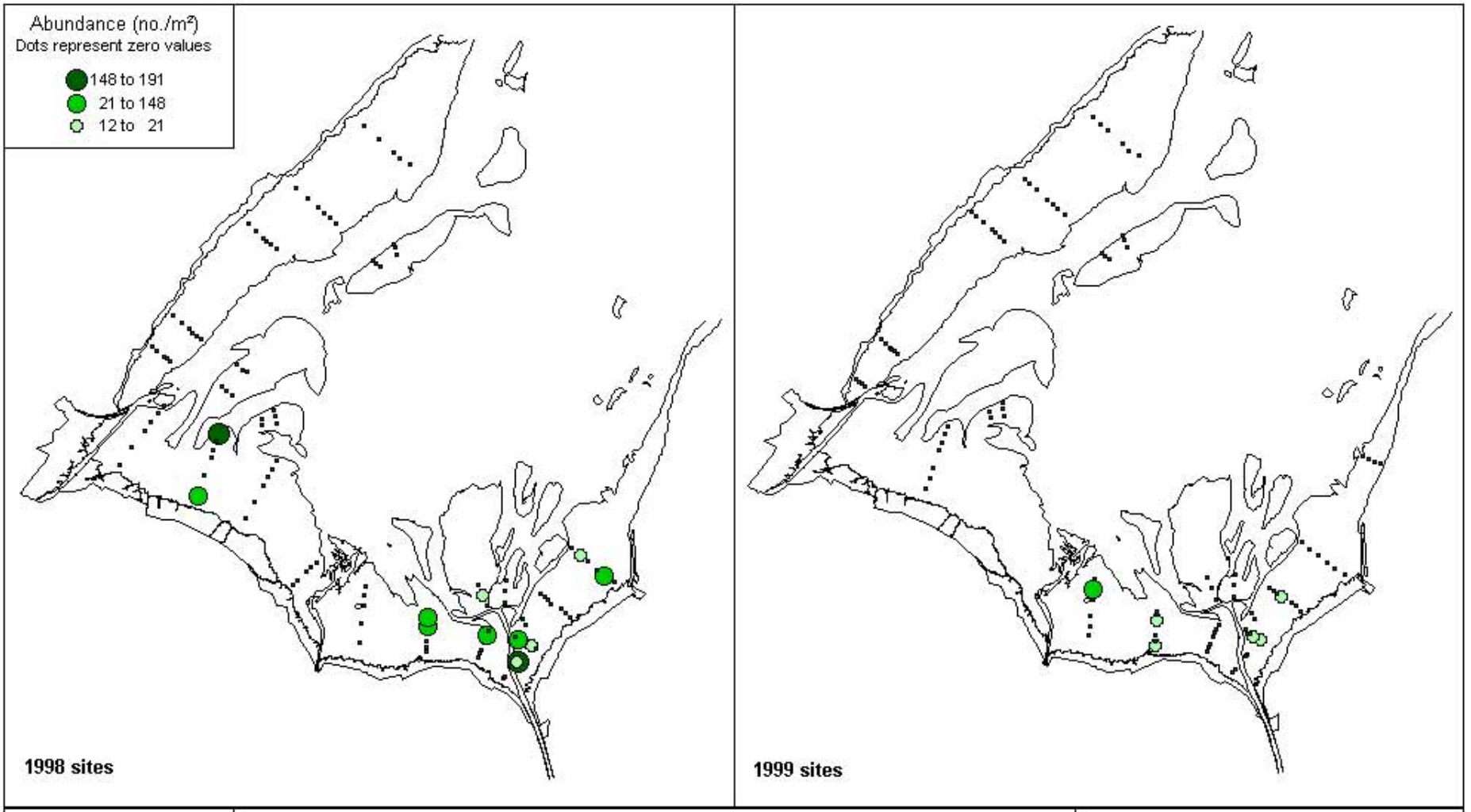


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**Figure 3.2.28 Mya arenaria distribution 1998 compared to 1999**

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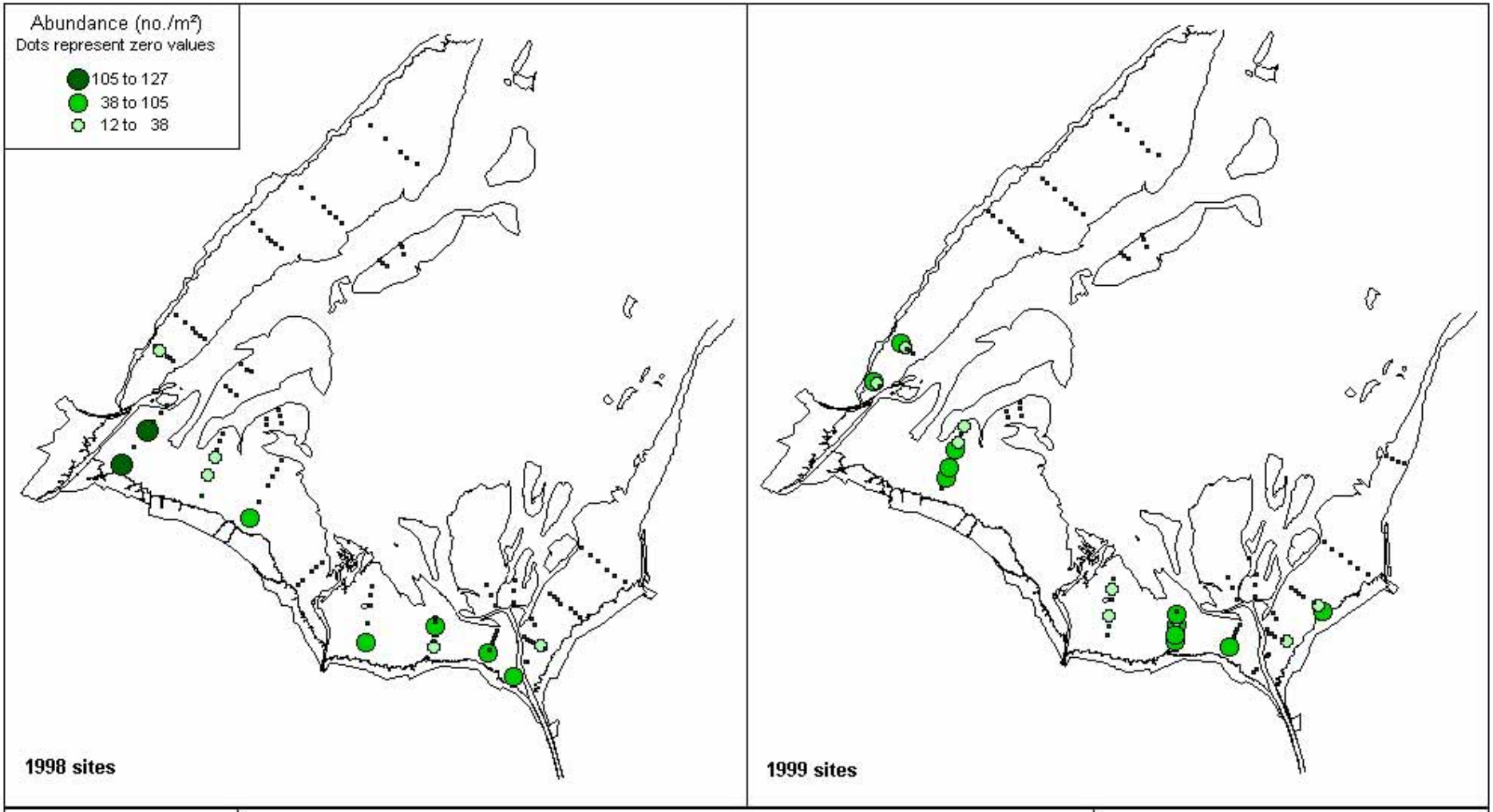


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Figure 3.2.29 Scrobicularia plana (20+mm) distribution 1998 compared to 1999

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**Figure 3.2.30 Biotope distribution in the Wash 1998 and 1999**

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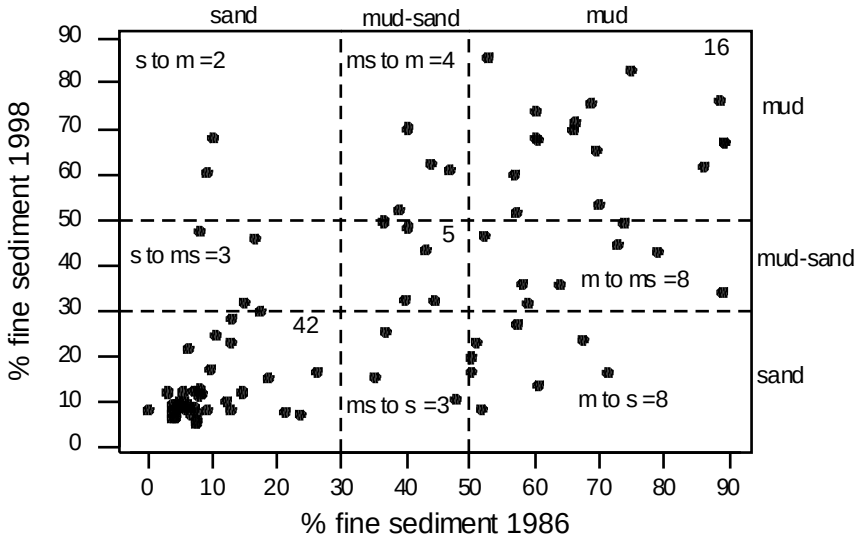
**a. 1986 and 1998. Total number of sites = 91**




**b. 1986 and 1999 . Total number of sites = 82**

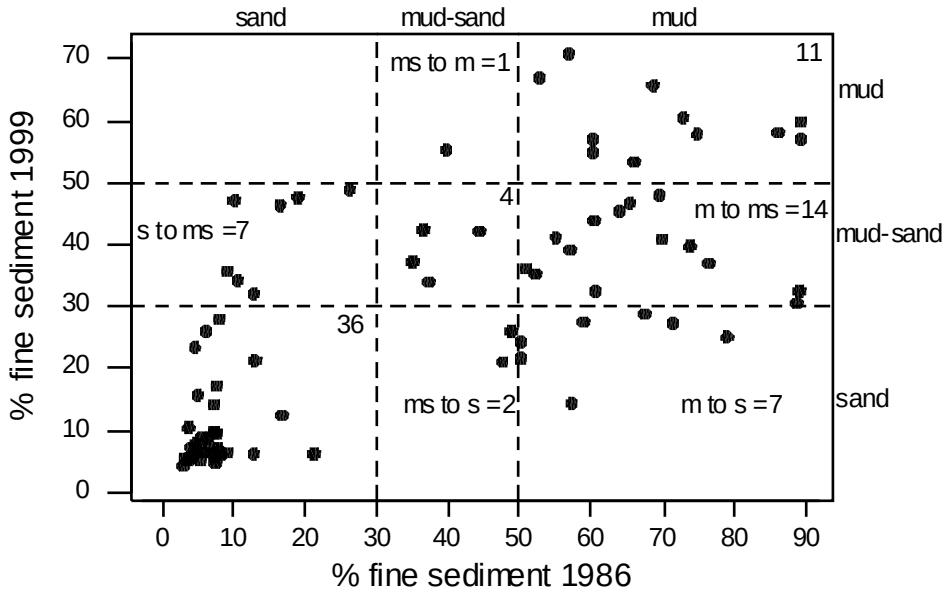
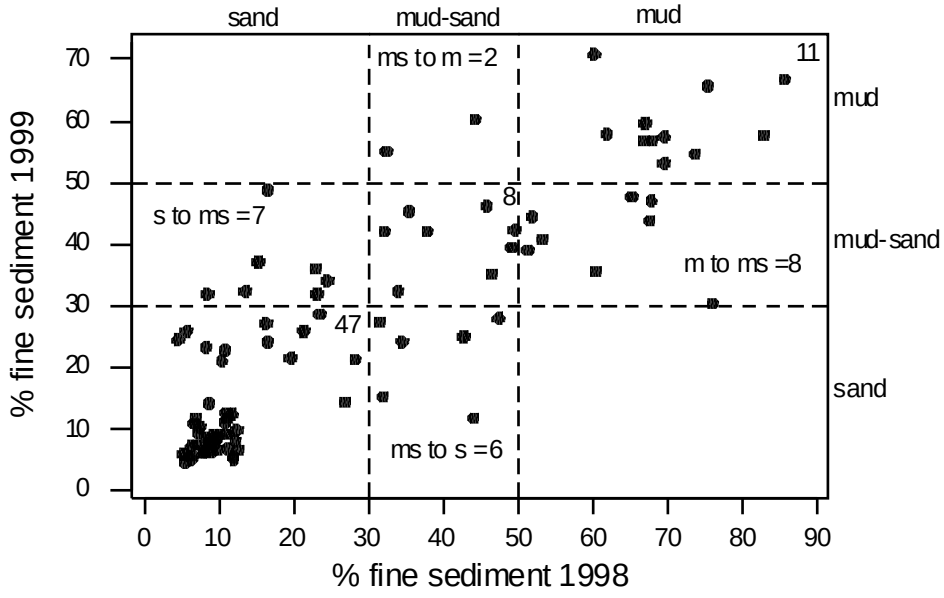



**Figure 3.3.1a, b and c. Comparisons of the percentage of fine sediment (particles <63 µm) within sample sites between one survey and another. a, 1986 and 1998, b, 1986 and 1999 and c, 1998 and 1999. Each point represents a single 1ha site. The dashed lines delineate the sediment categories, sand, mud-sand and mud as defined in section 3.1.1 of the text. The number of sites whose sediment did not change between one survey and another is shown in the top, right-hand corner of the sediment category 'box'. The numbers of sites whose sediment category did change is also shown, for example, in a, the number of sites that changed from sand to mud between 1986 and 1998 equalled 2 and is indicated by 's to m =2' in the graph.**

**Figure 3.3.1 continued.**

**C. 1998 and 1999. Total number of sites = 89.**



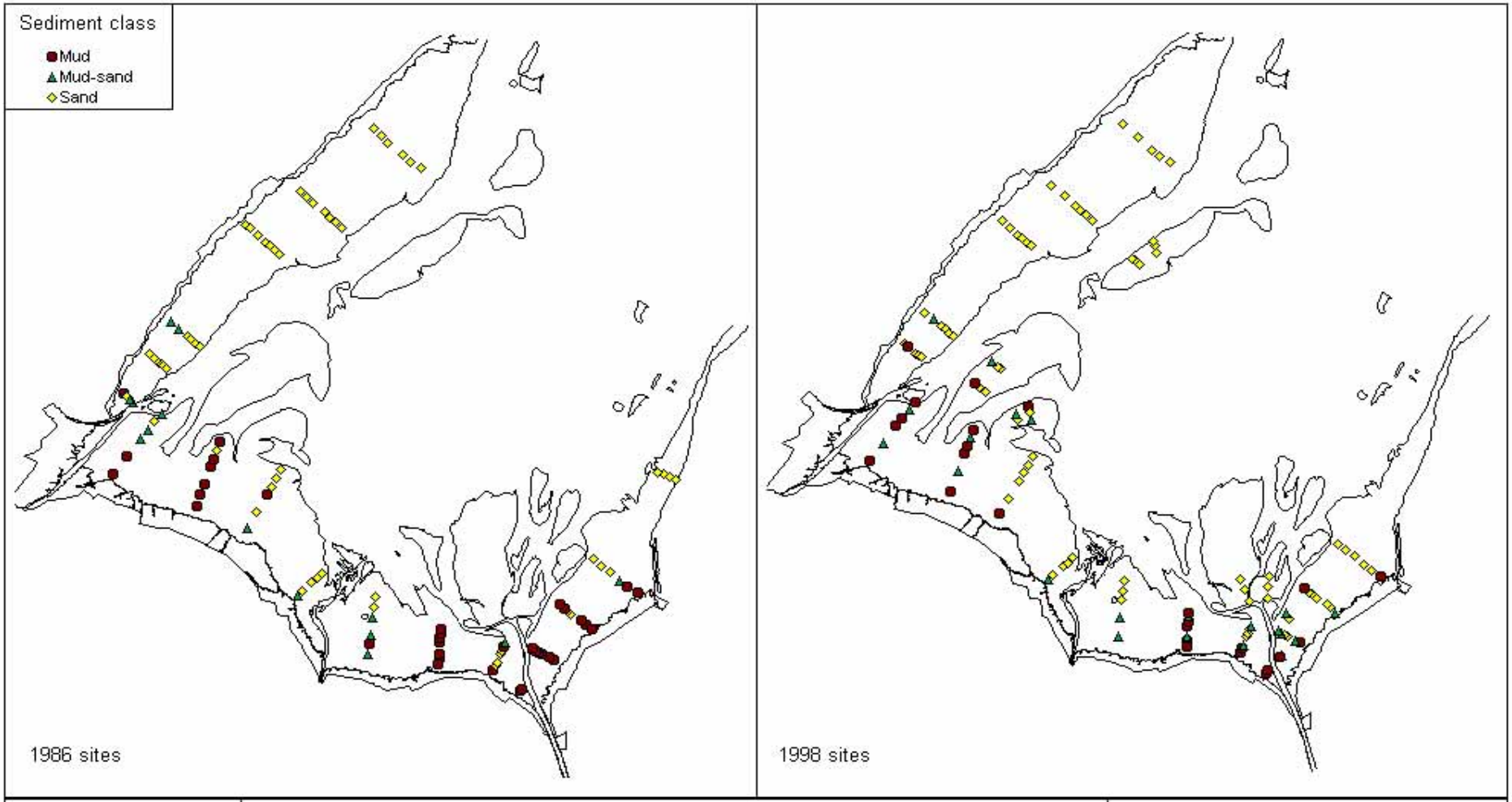



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**Figure 3.3.2a Sediment class maps for sites sampled in the 1986 and 1998 surveys**

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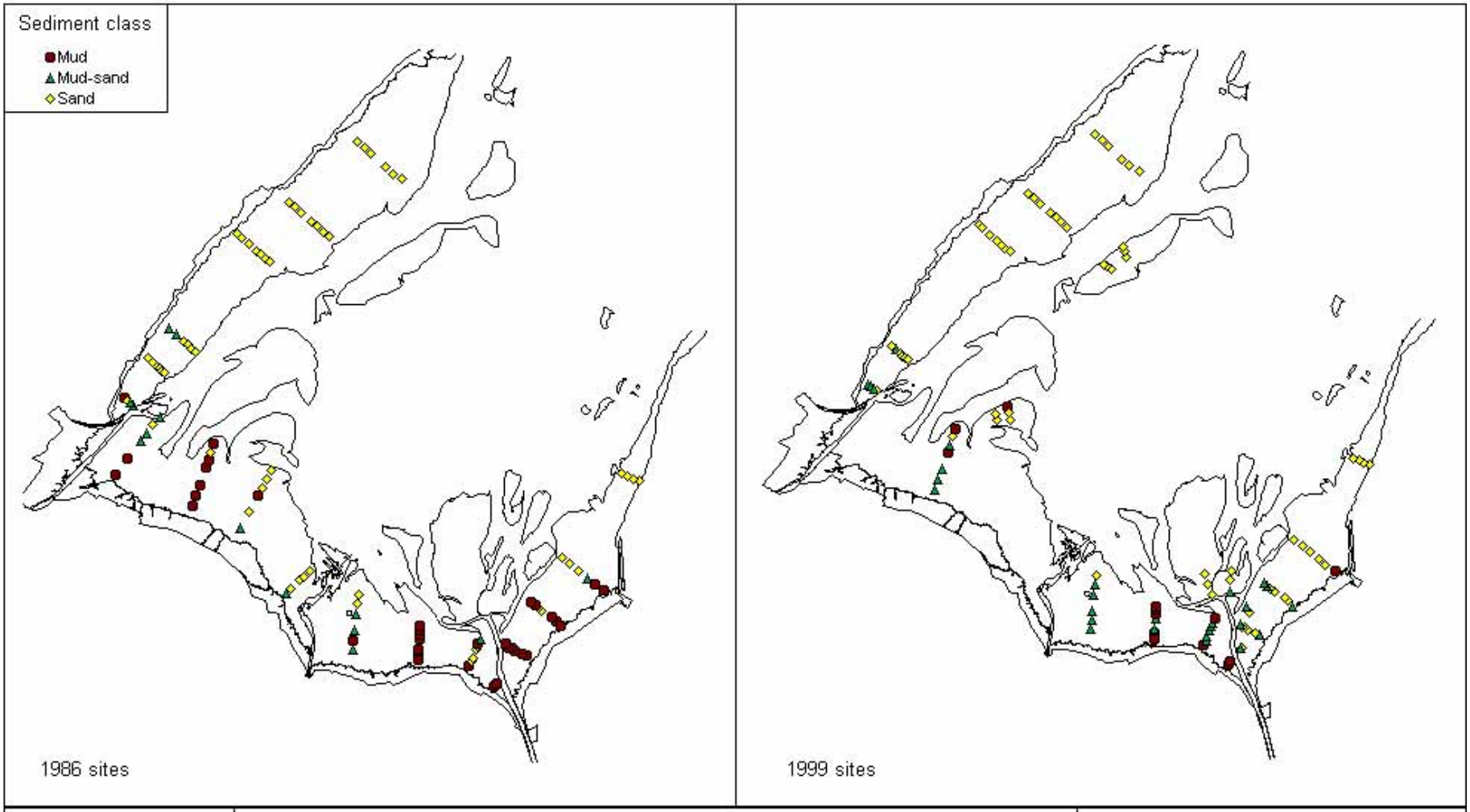


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**Figure 3.3.2b Sediment class maps for sites sampled in the 1986 and 1999 surveys**

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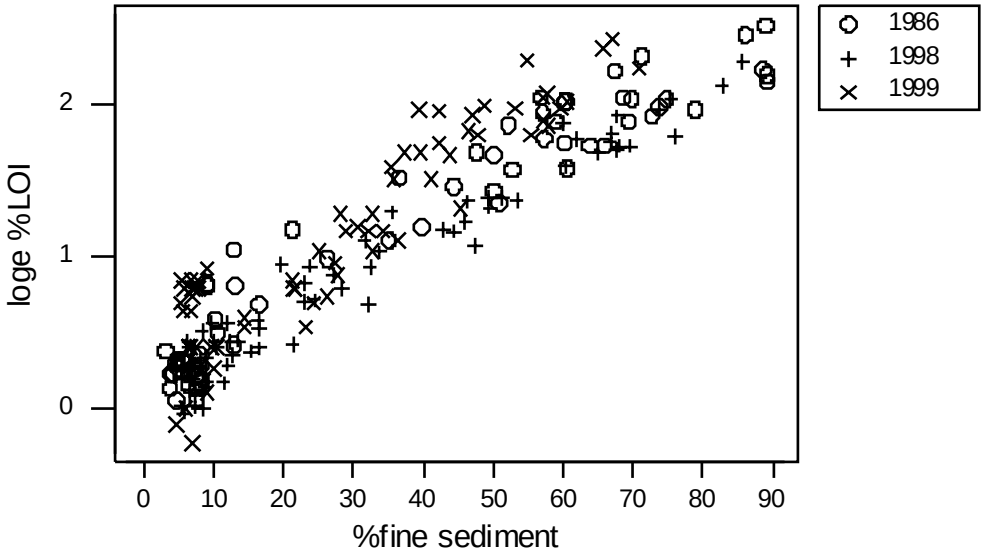
**a.**




**b.**

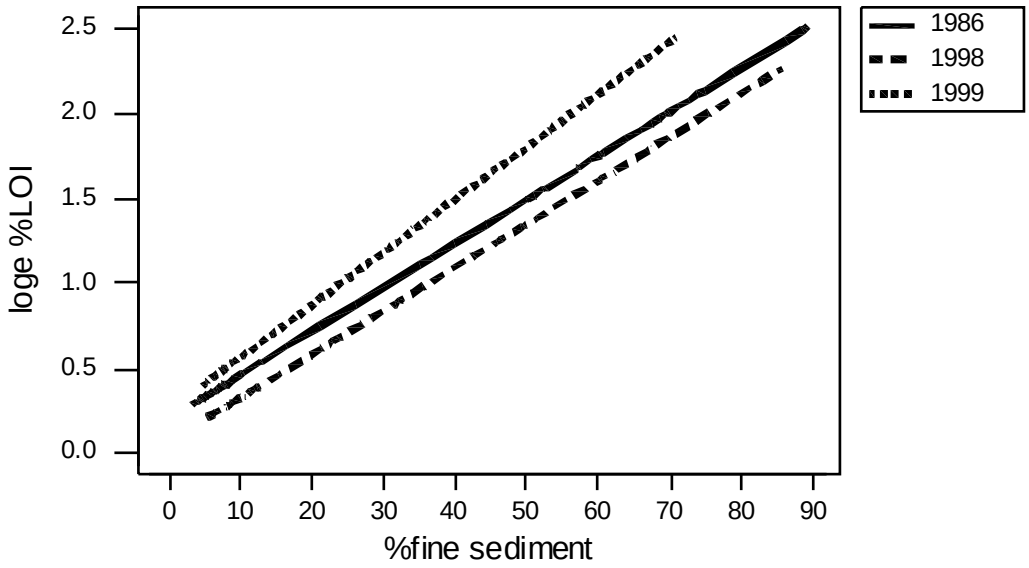



**Figure 3.3.3a and b. The relationship between the organic content, expressed as log*e* percentage Loss on Ignition (%LOI) and the percentage of fines (particles <63 μm) in the sediment for the 68, 1ha sites sampled in the 1986, 1998 and 1999 surveys. a, shows the individual data points relating to each sample site which have been assigned different symbols for each survey and b, shows the fitted least squares regression line for each year's survey as follows: in 1986 $y=0.2+0.026x$, in 1998 $y=0.07+0.026x$ and in 1999 $y=0.26+0.031x$**

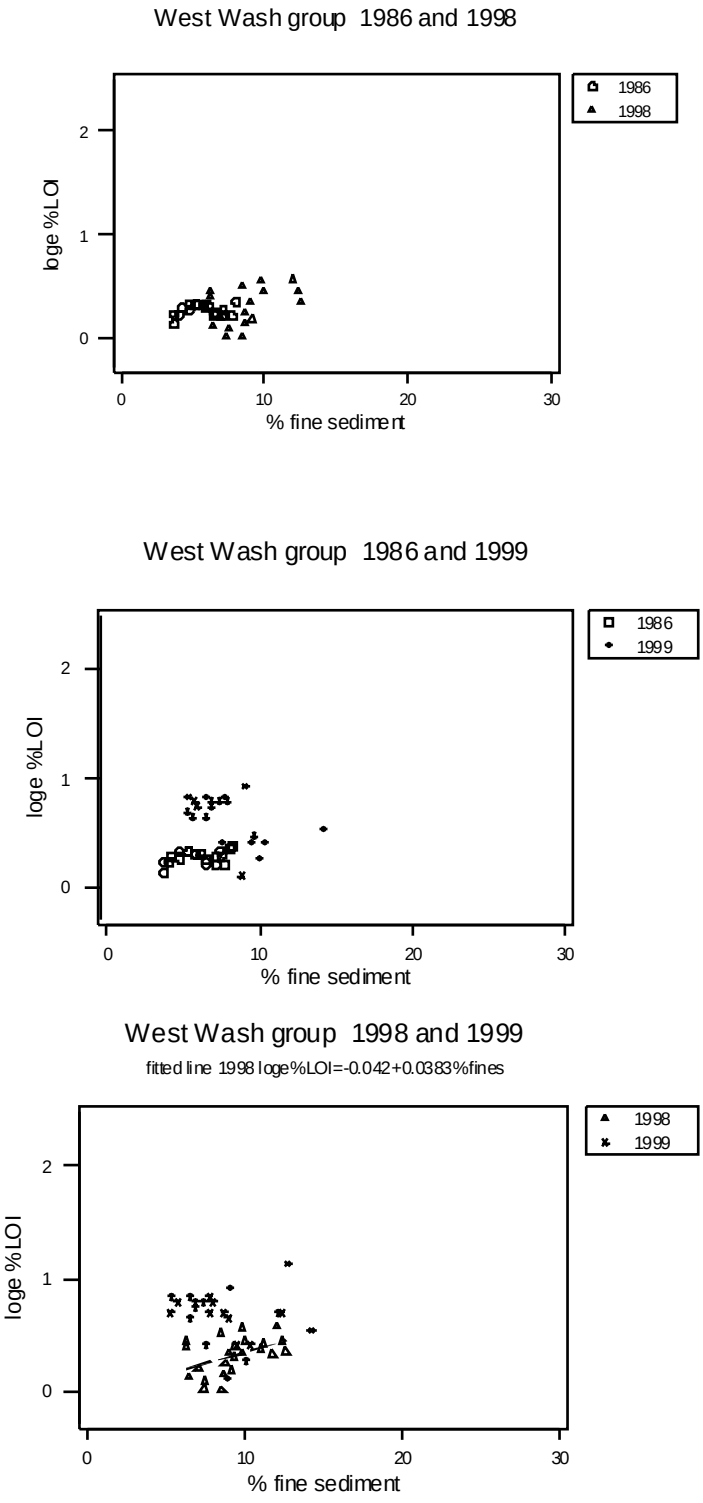



**Figure 3.3.4. Between-survey comparisons of the relationship between organic content, expressed as log*e* percentage Loss on Ignition (%LOI) and the percentage of fines (particles <63 µm) in the sediment for sample sites in the west Wash group. The fitted least squares regression line is shown where the relationship was statistically significant.**

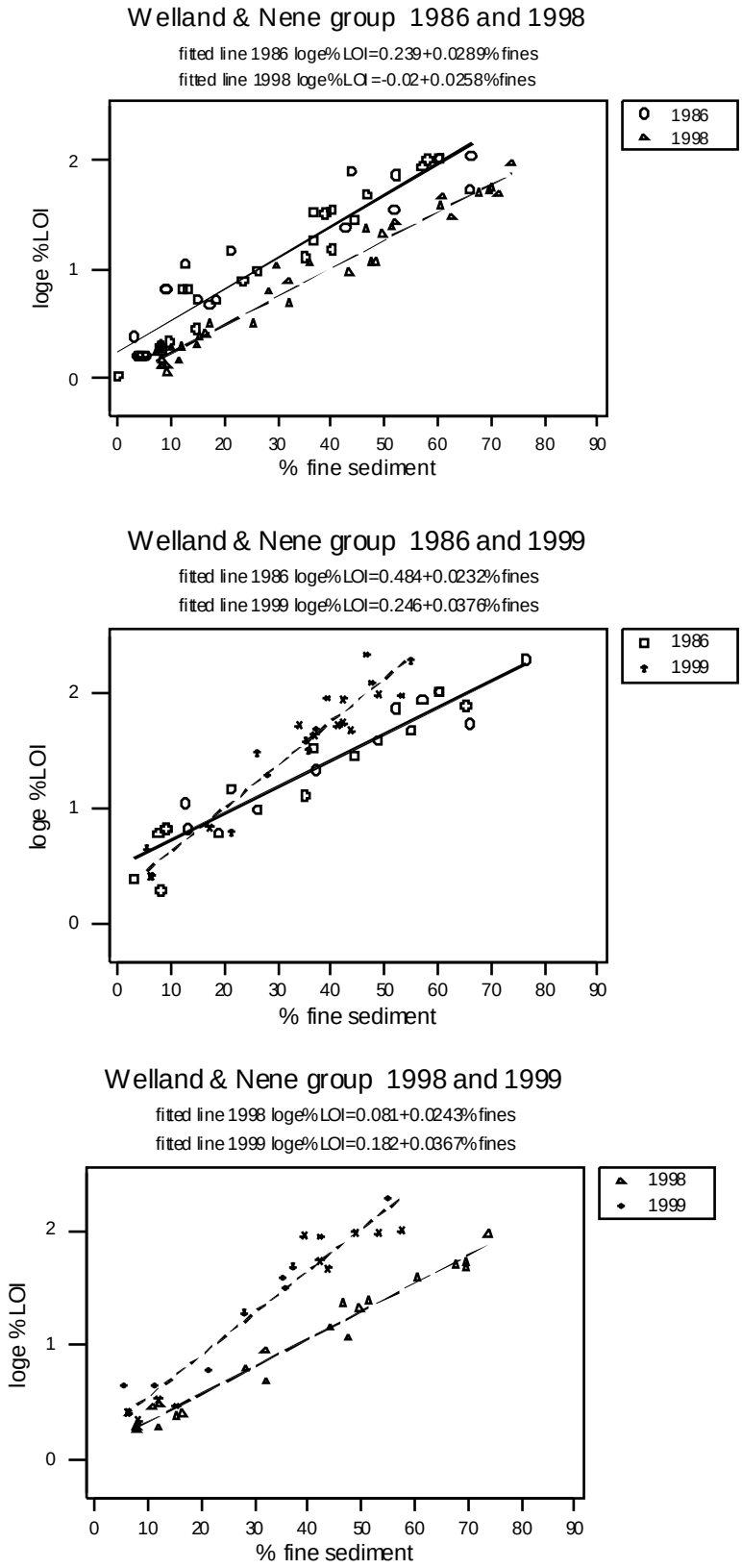



**Figure 3.3.5 Between-survey comparisons of the relationship between organic content, expressed as log*e* percentage Loss on Ignition (%LOI) and the percentage of fines (particles <63 μm) in the sediment for sample sites in the Welland and Nene group. The fitted least squares regression line is shown where the relationship was statistically significant.**

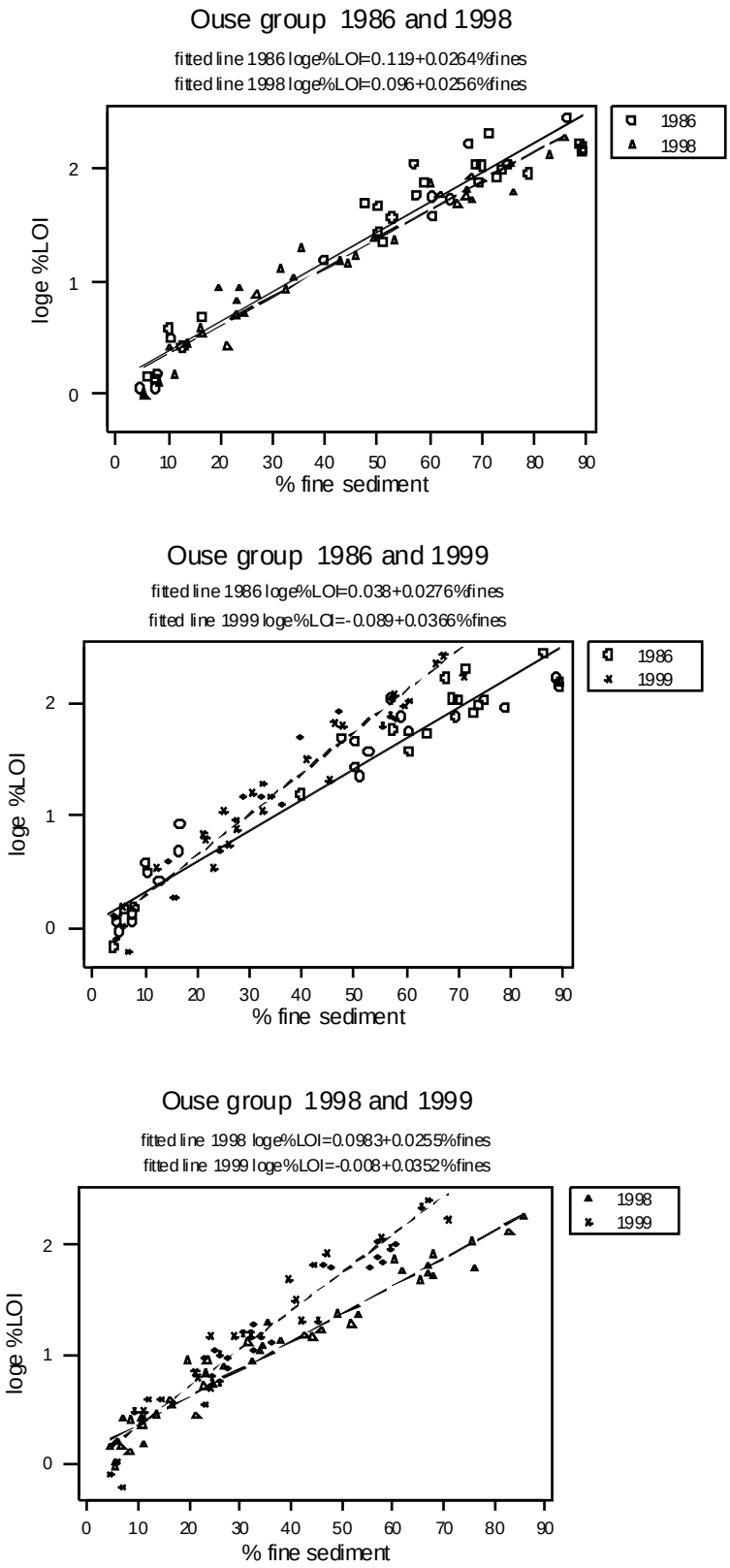



**Figure 3.3.6 Between-survey comparisons of the relationship between organic content, expressed as log*e* percentage Loss on Ignition (%LOI) and the percentage of fines (particles <63 μm) in the sediment for sample sites in the Ouse group. The fitted least squares regression line is shown where the relationship was statistically significant.**

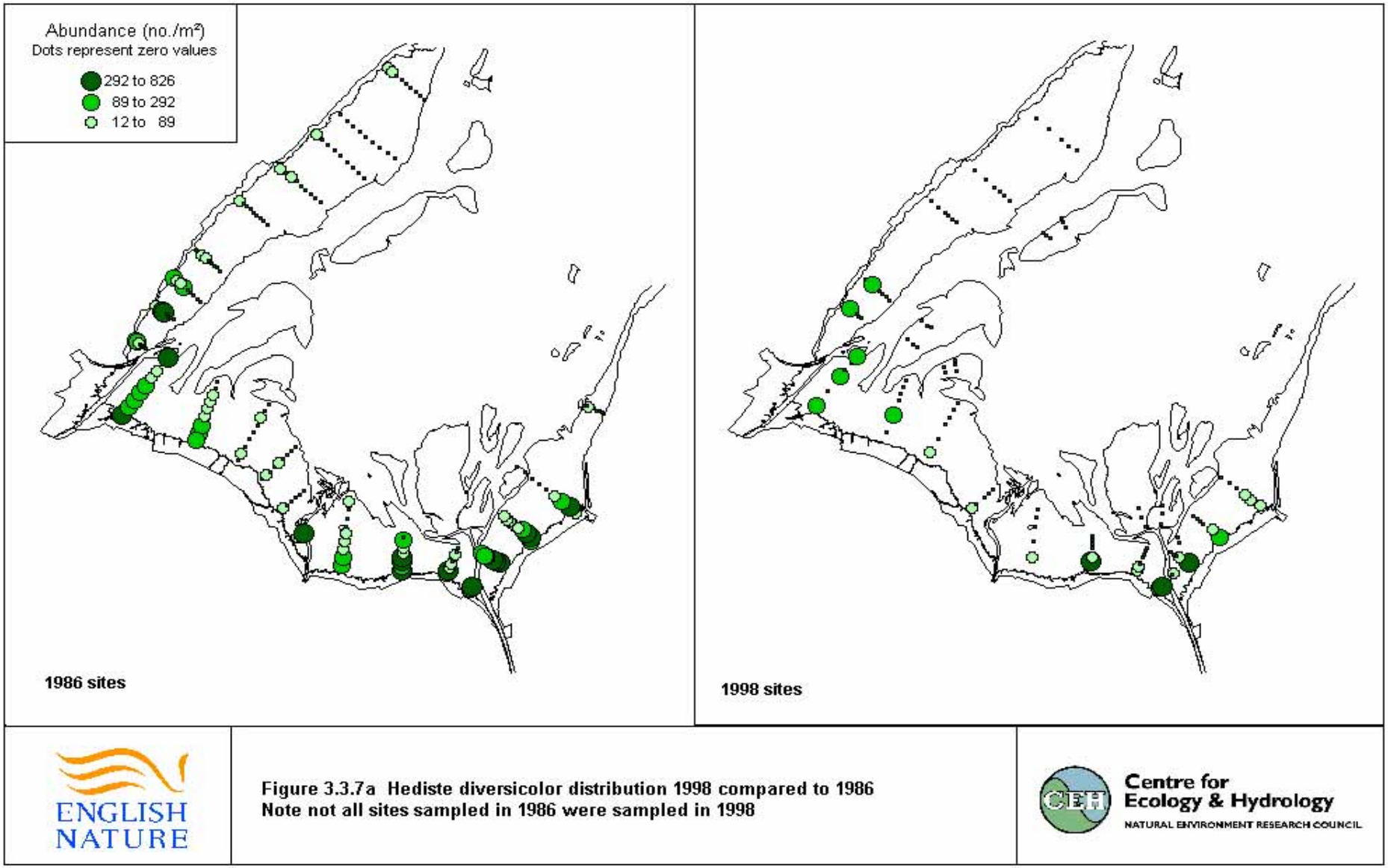



**Figure 3.3.7a Hediste diversicolor distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

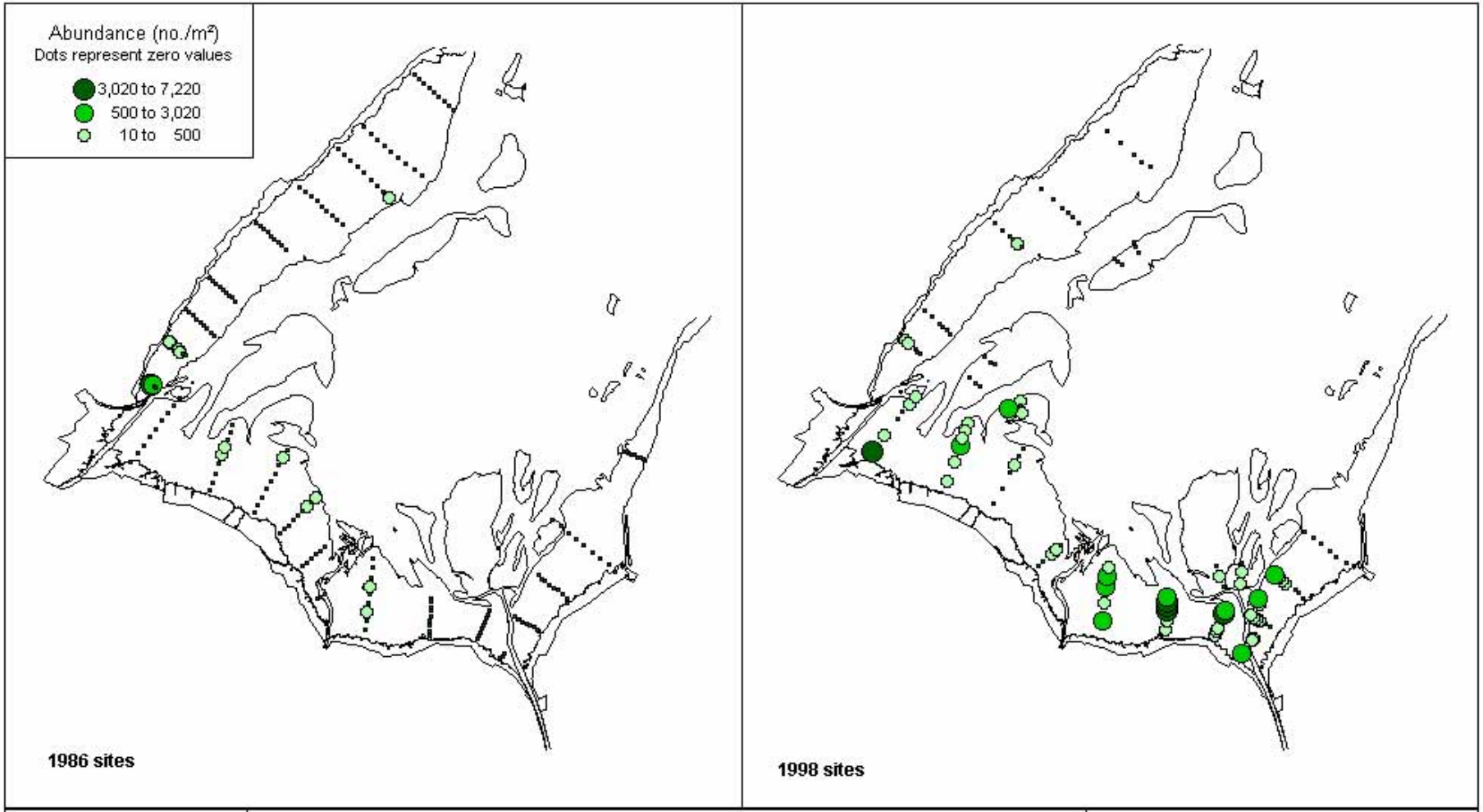



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**Figure 3.3.7b Cirratulid distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7c Arenicola marina distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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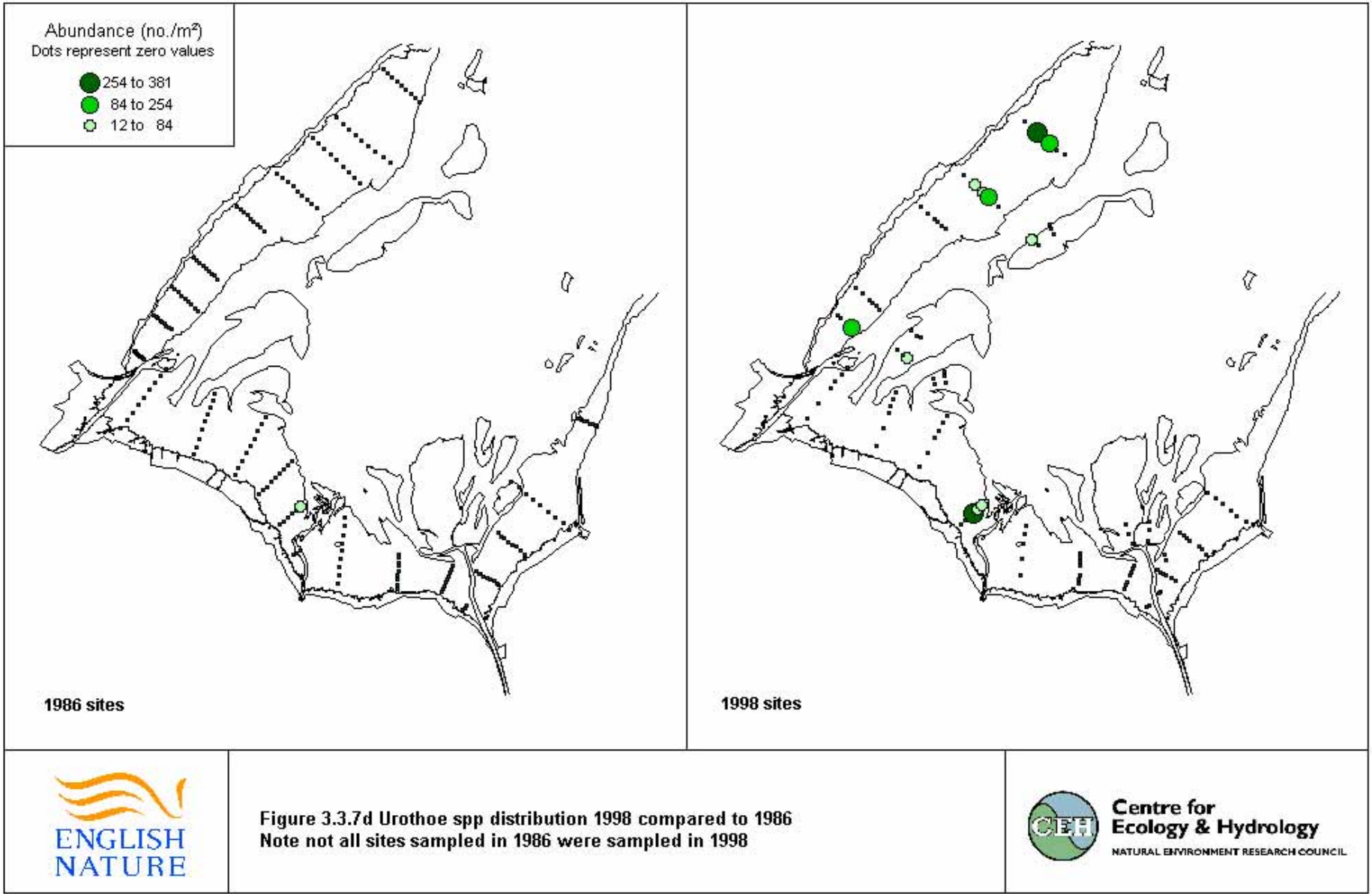


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**Figure 3.3.7d Urothoe spp distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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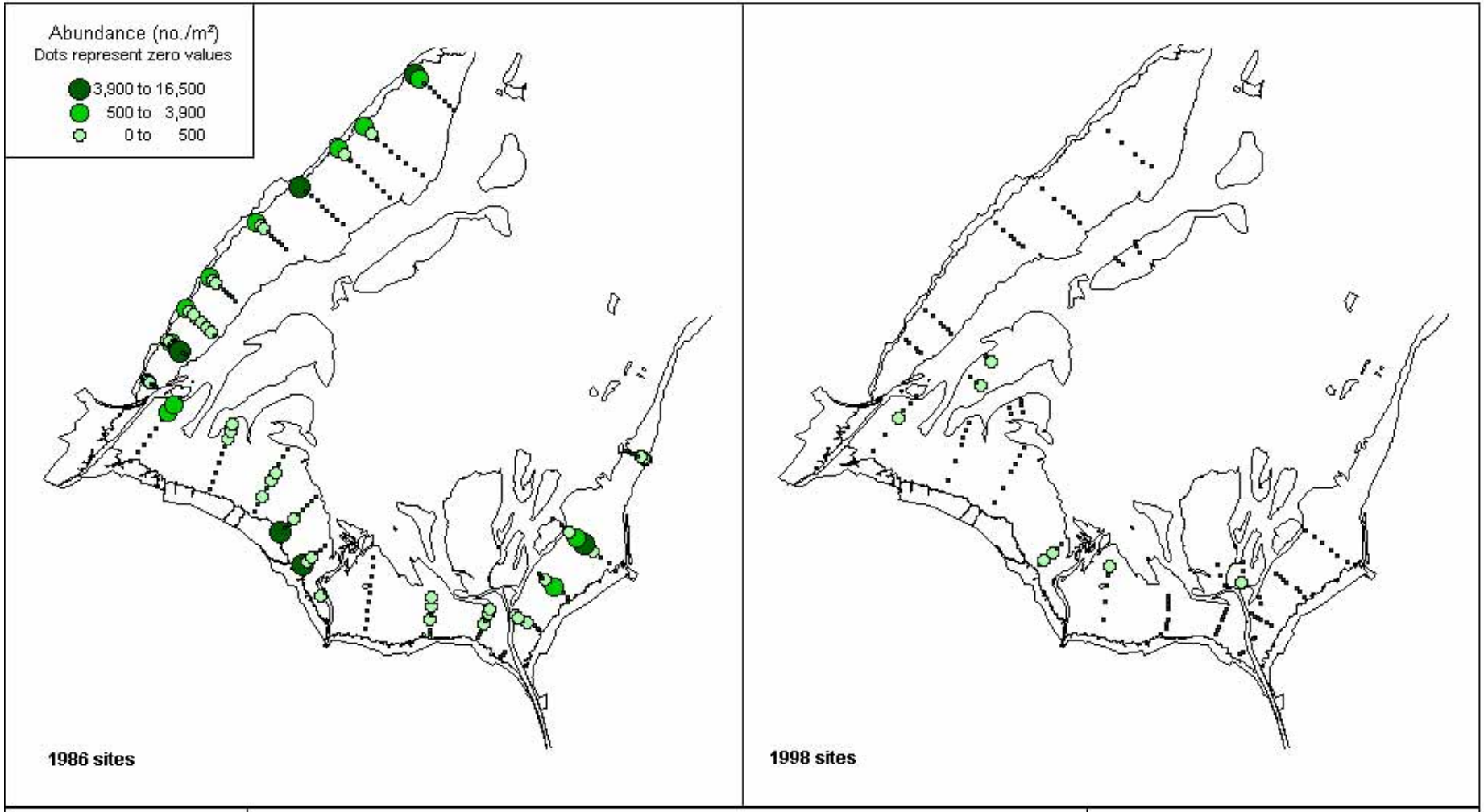


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**Figure 3.3.7e Corophium arenarium distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7f Crangon crangon distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7g Cerastoderma edule (20-30mm) distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7h Macoma balthica (<9mm) distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7i Macoma balthica (6 - 15mm) distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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**Figure 3.3.7j Macoma balthica (9 - 20mm) distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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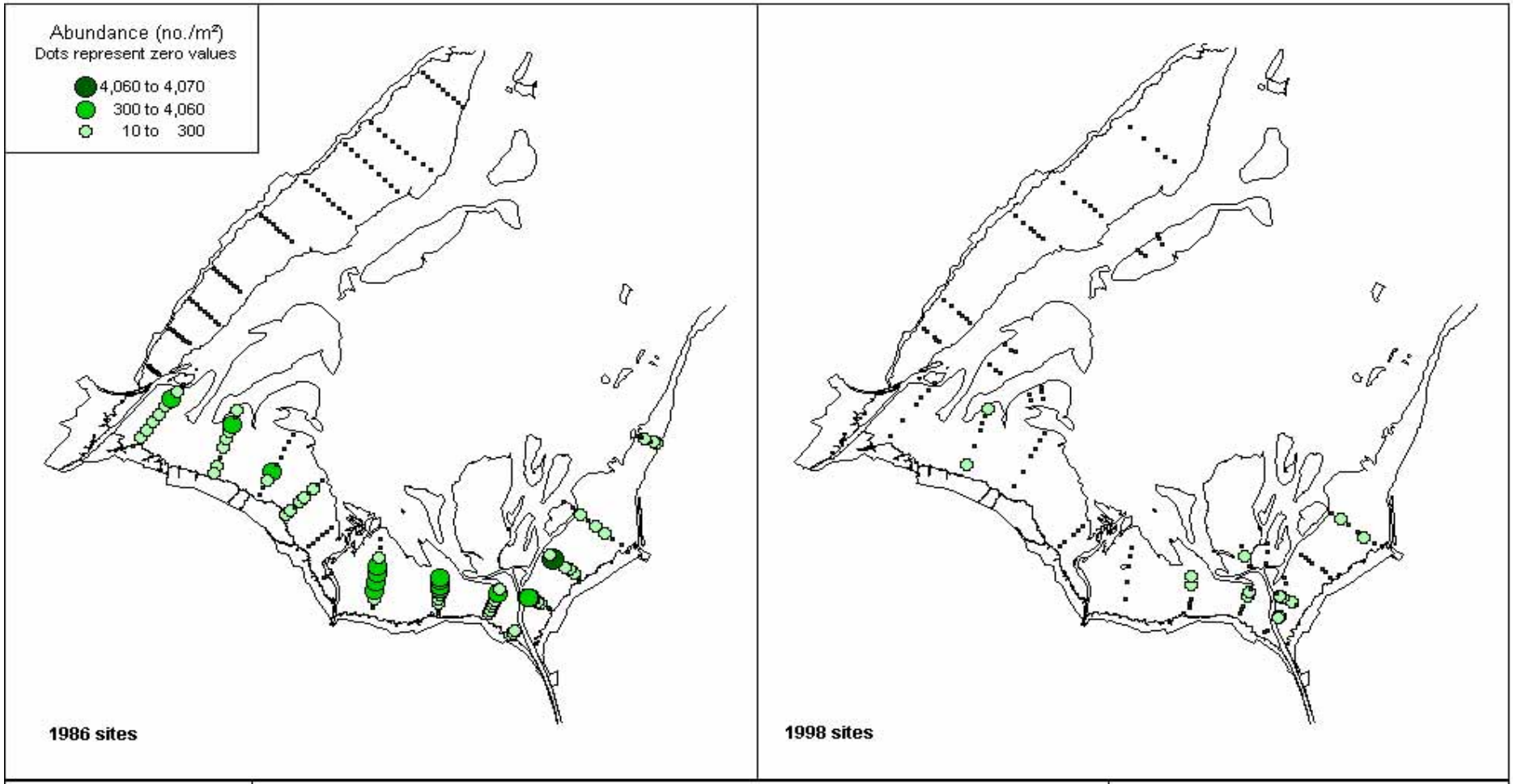


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**Figure 3.3.7k Mya arenaria distribution 1998 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1998**

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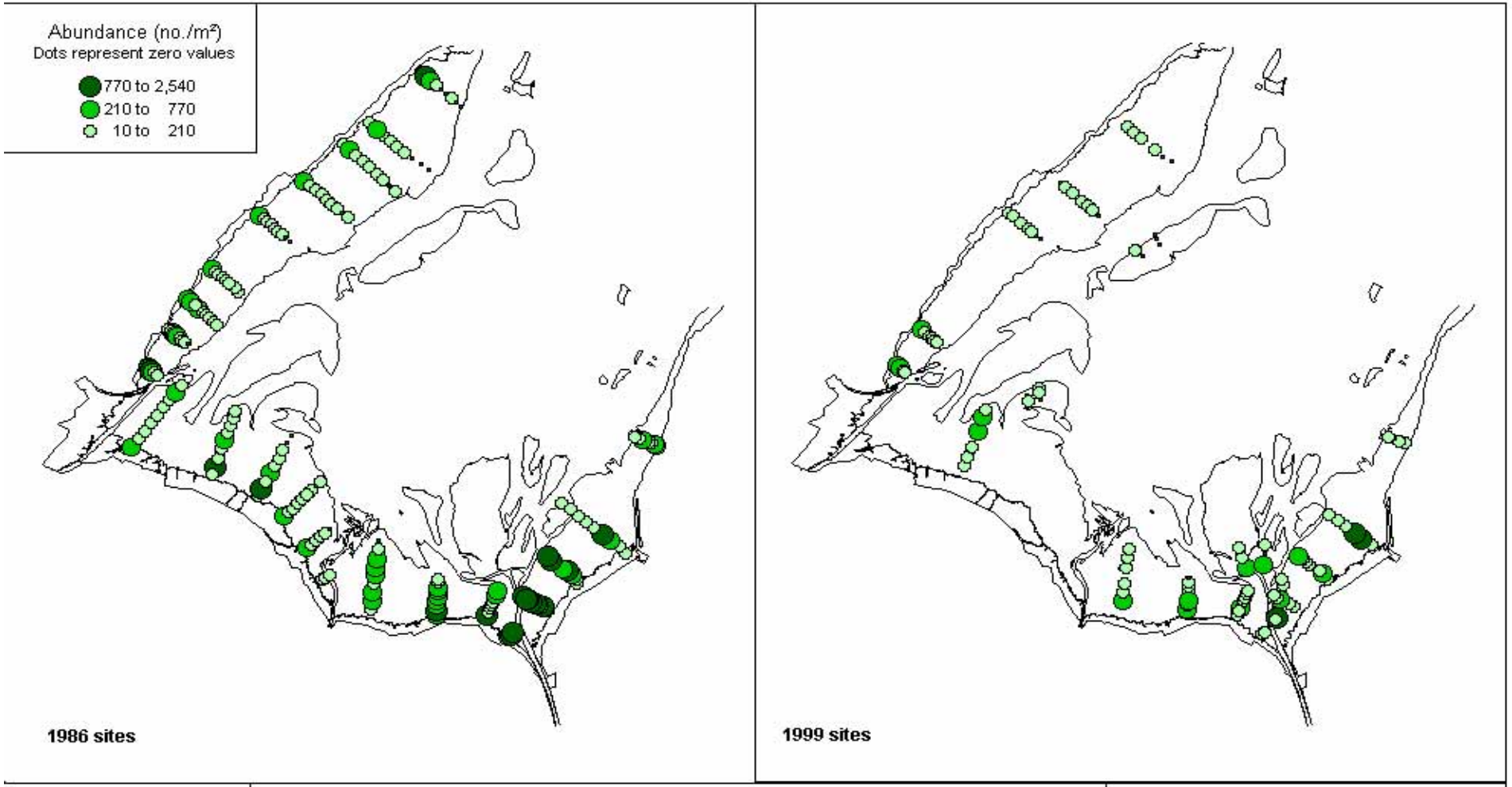


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**Figure 3.3.8a Phyllodocid distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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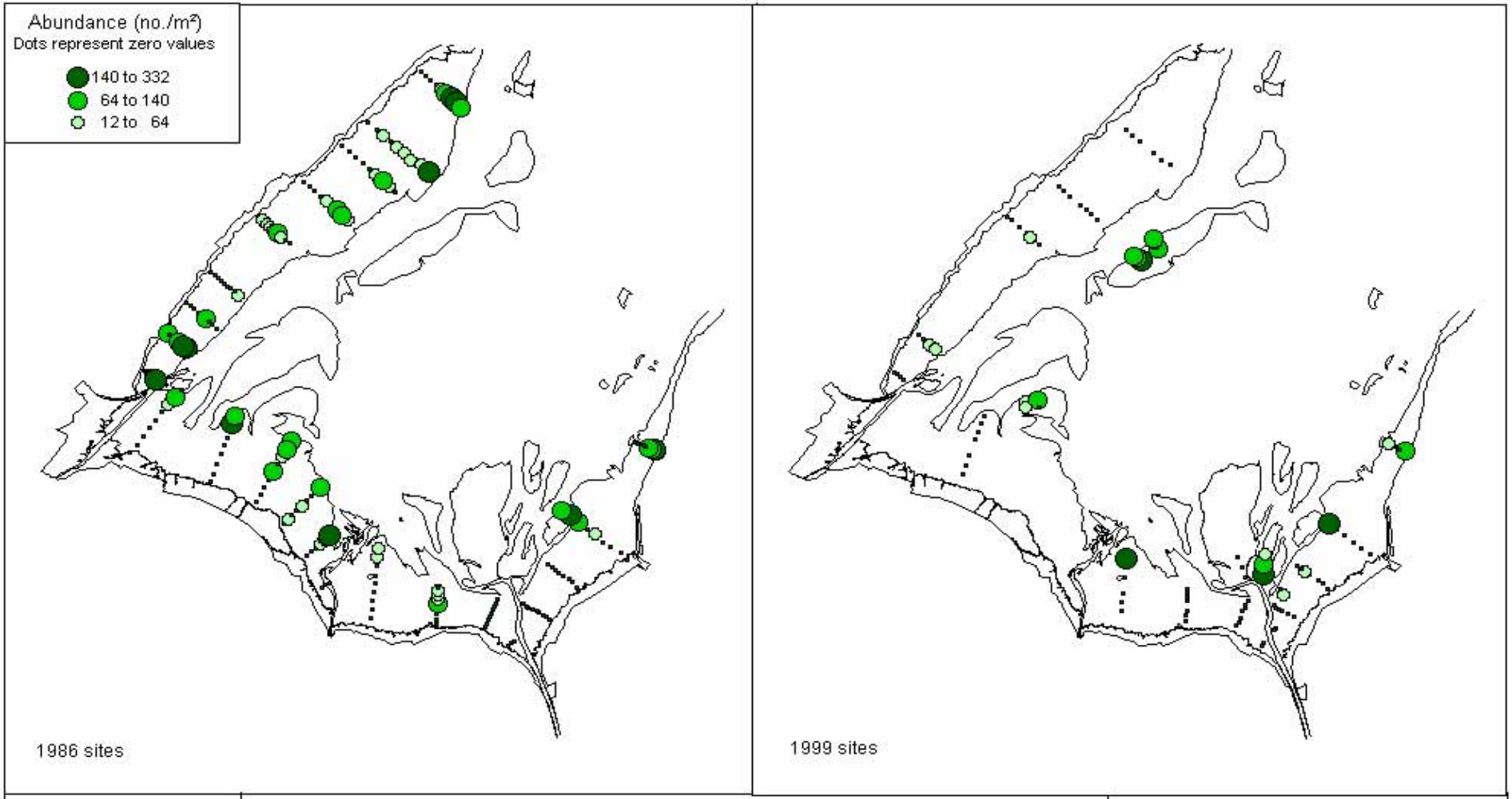


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**Figure 3.3.8b Other Nephtys spp distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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**Figure 3.3.8c Arenicola marina distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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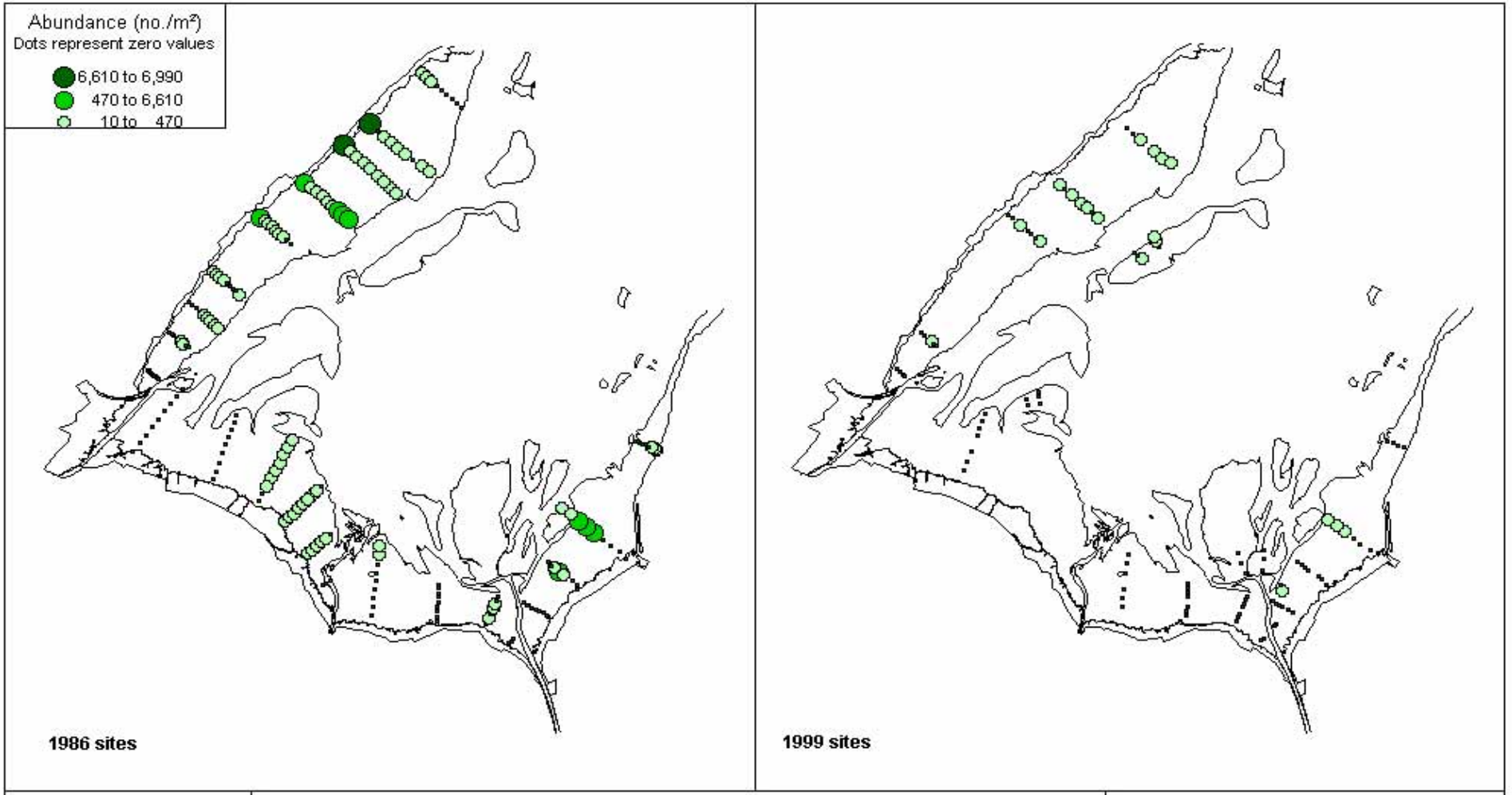


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**Figure 3.3.8d Bathyporeia distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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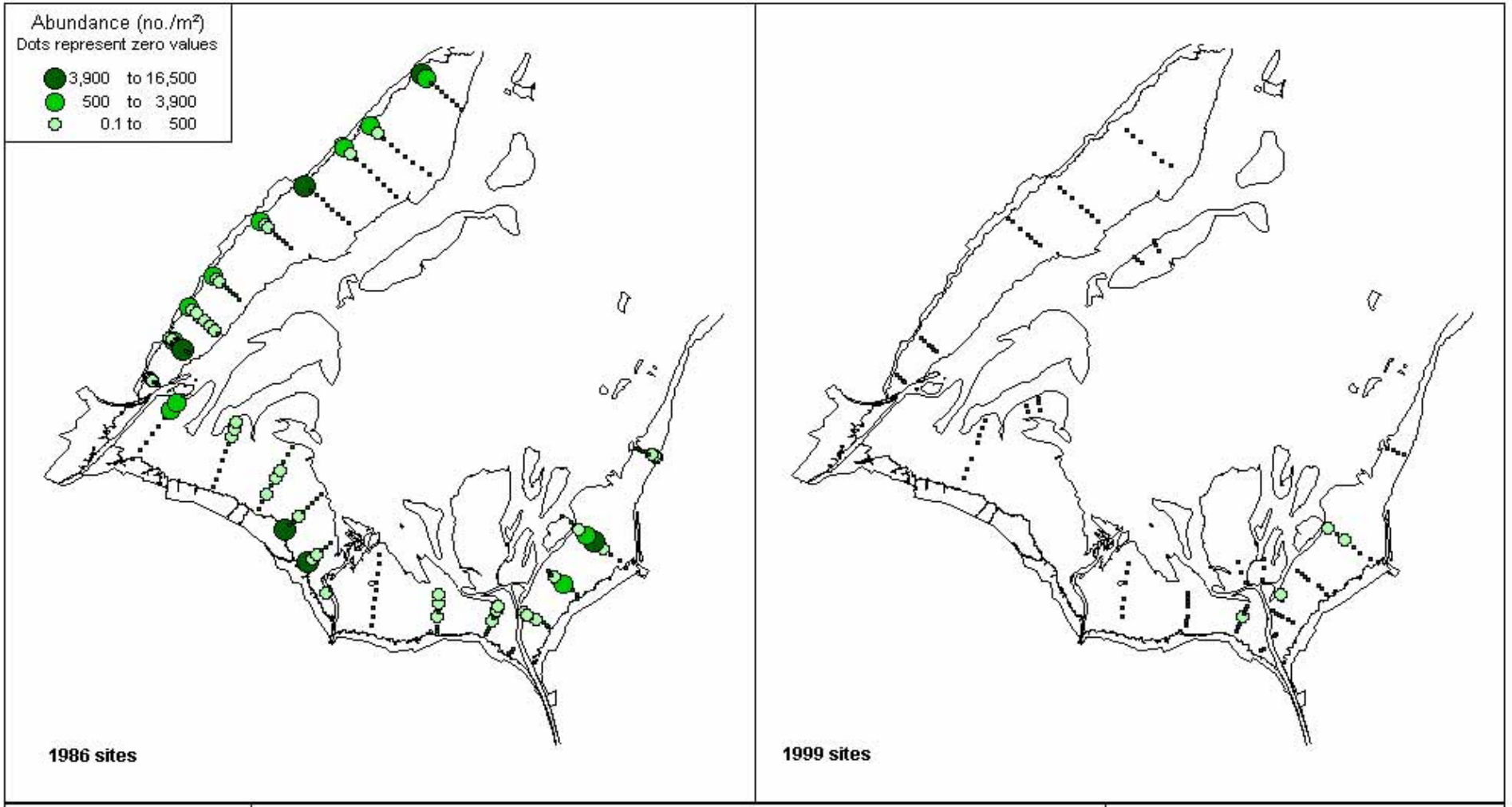


**Figure 3.3.8e Corophium arenarium distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

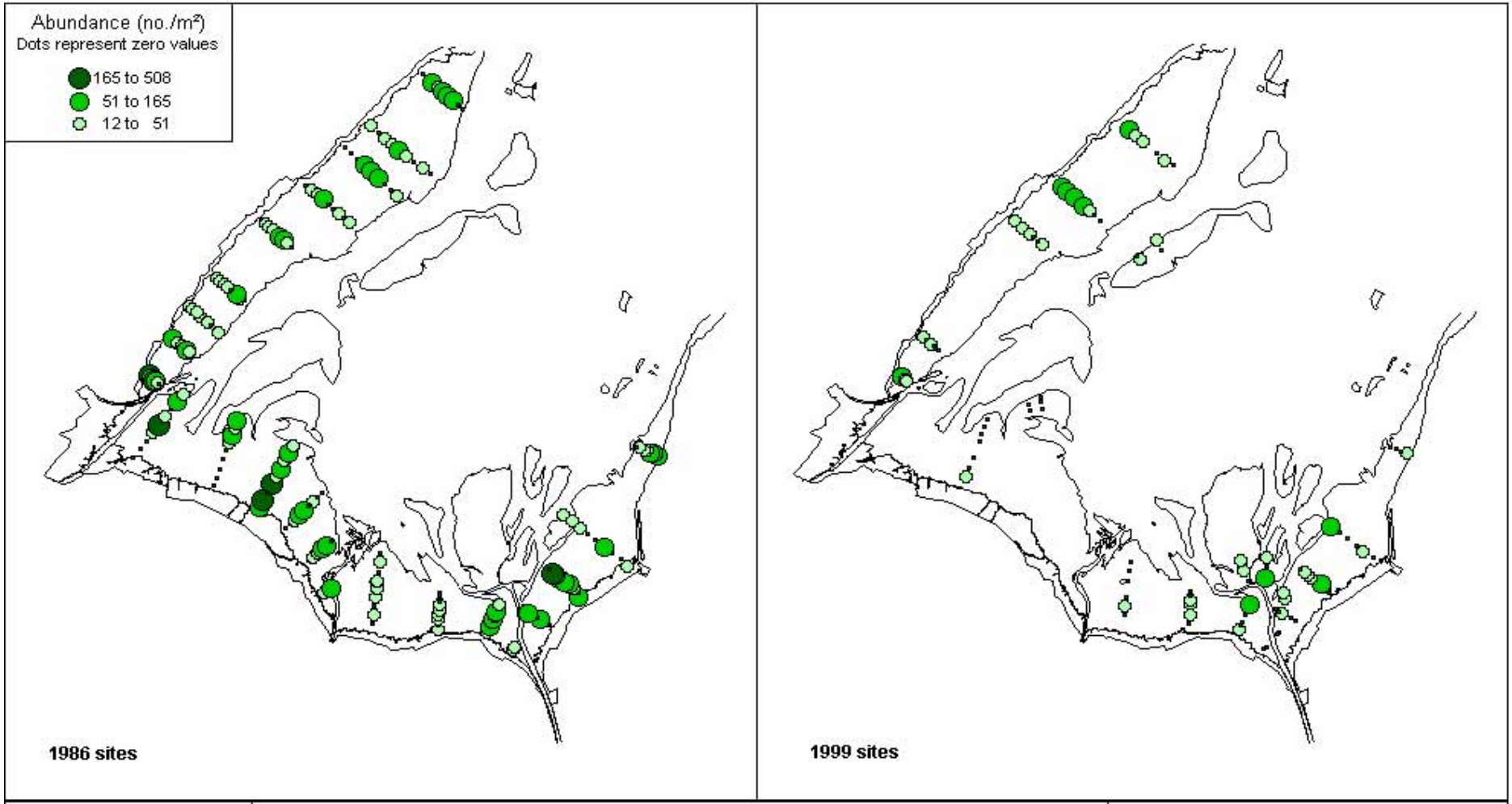


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**Figure 3.3.8f Crangon crangon distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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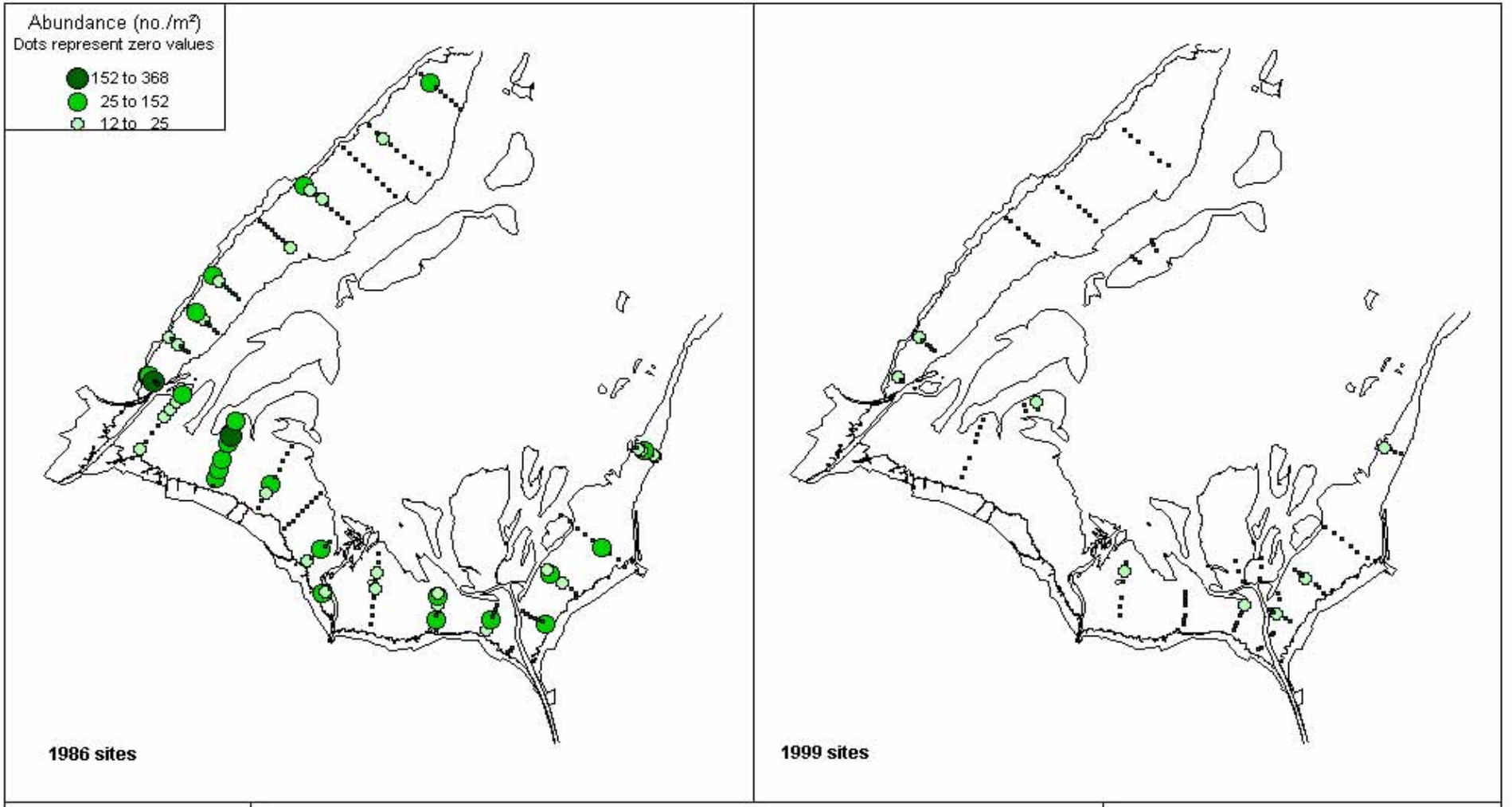


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**Figure 3.3.8g Carcinus maenas distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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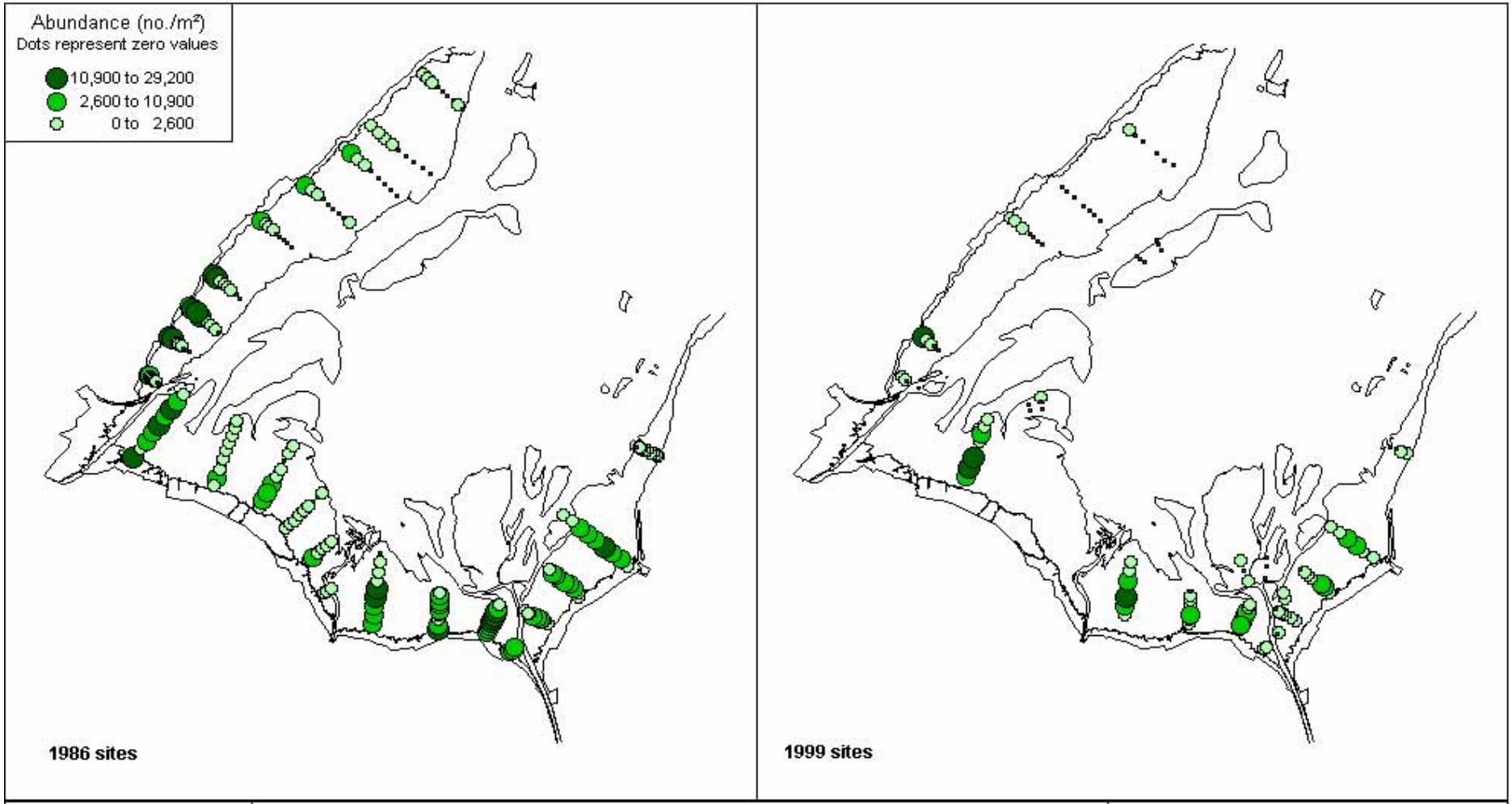


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**Figure 3.3.8h Hydrobia ulvae distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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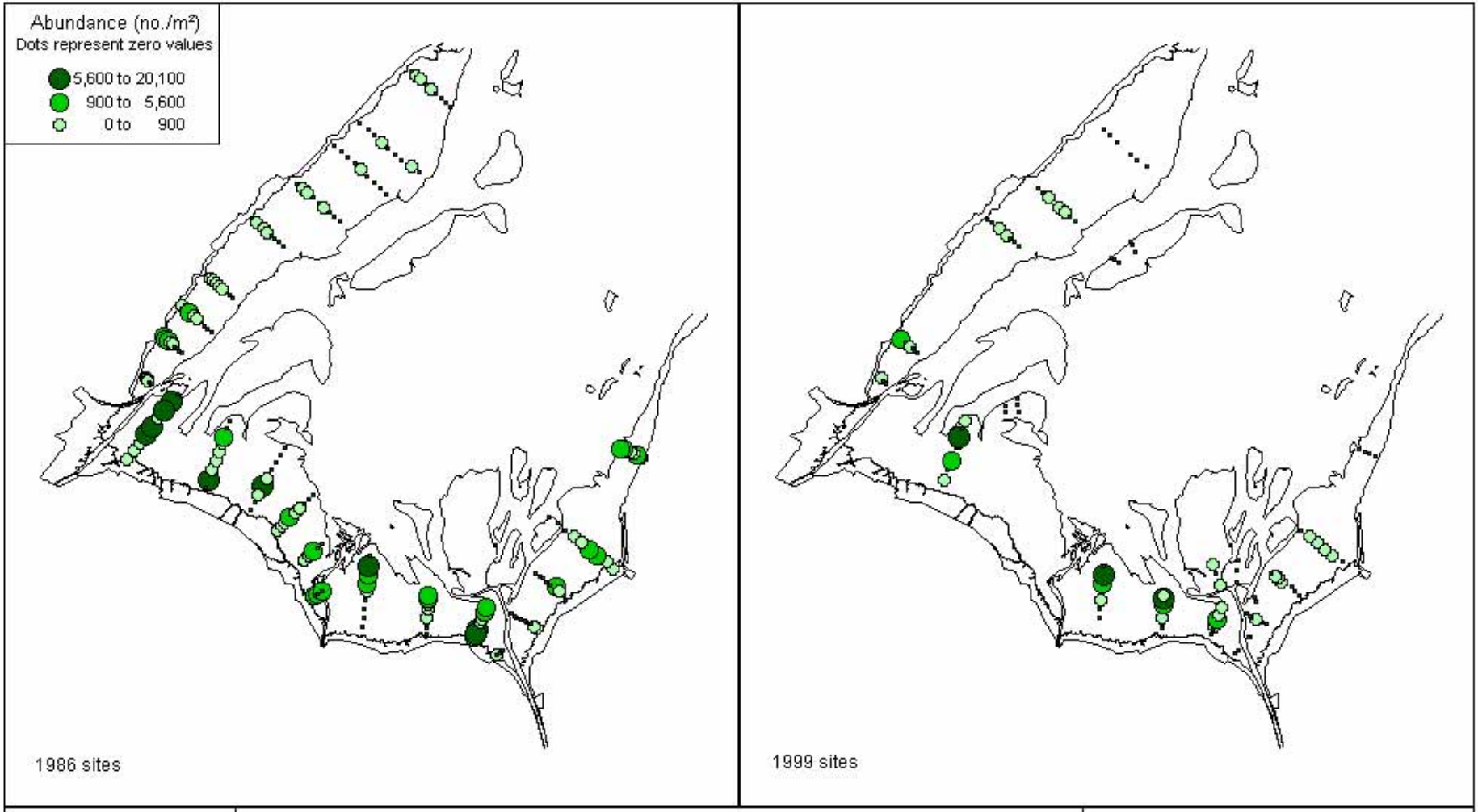


**Figure 3.3.8i Cerastoderma edule (4-10mm) distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

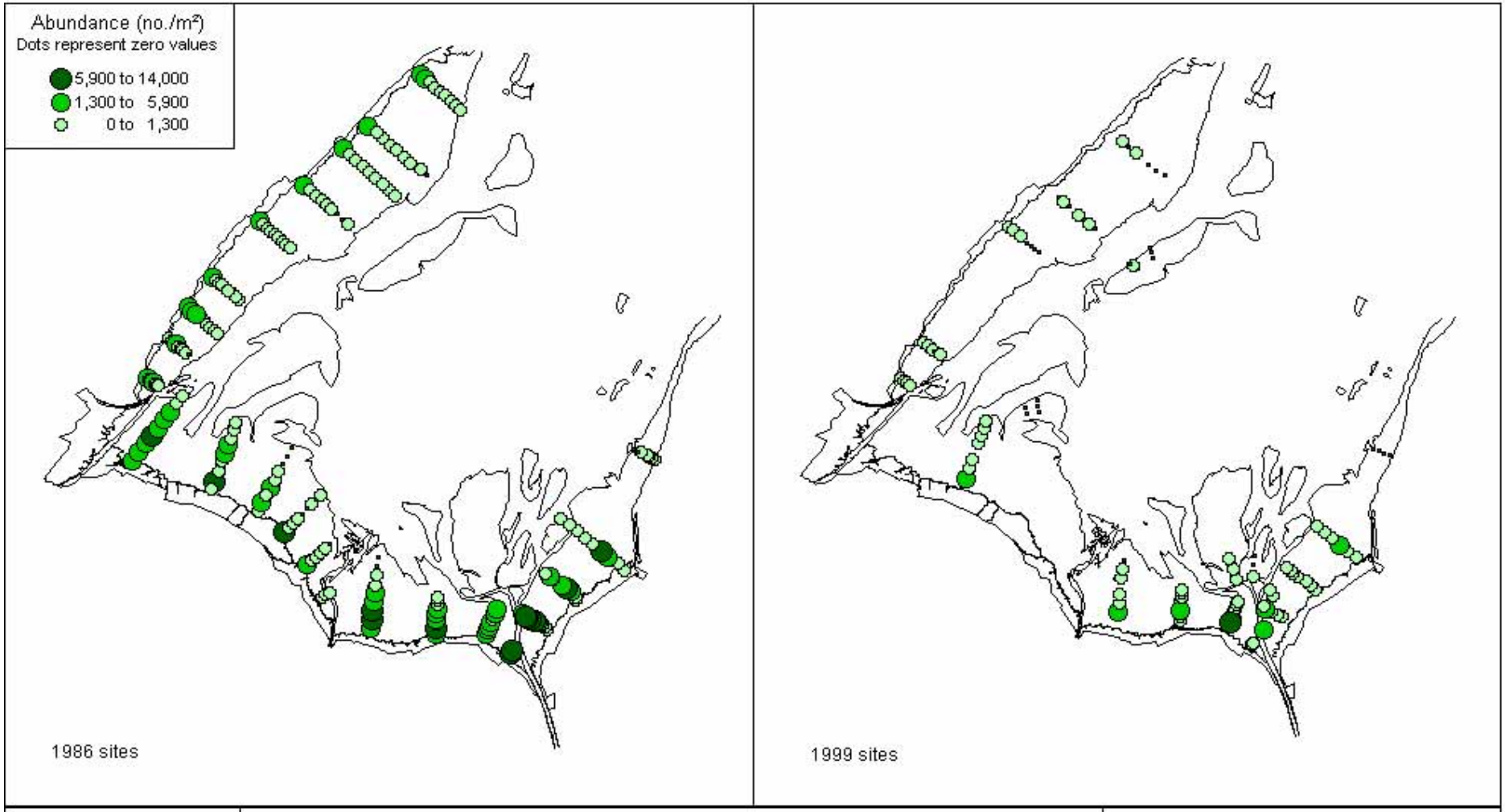


**Figure 3.3.8j Macoma balthica (<9mm) distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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**Figure 3.3.8k Macoma balthica (6 - 15mm) distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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**Figure 3.3.8l Macoma balthica (9 - 20mm) distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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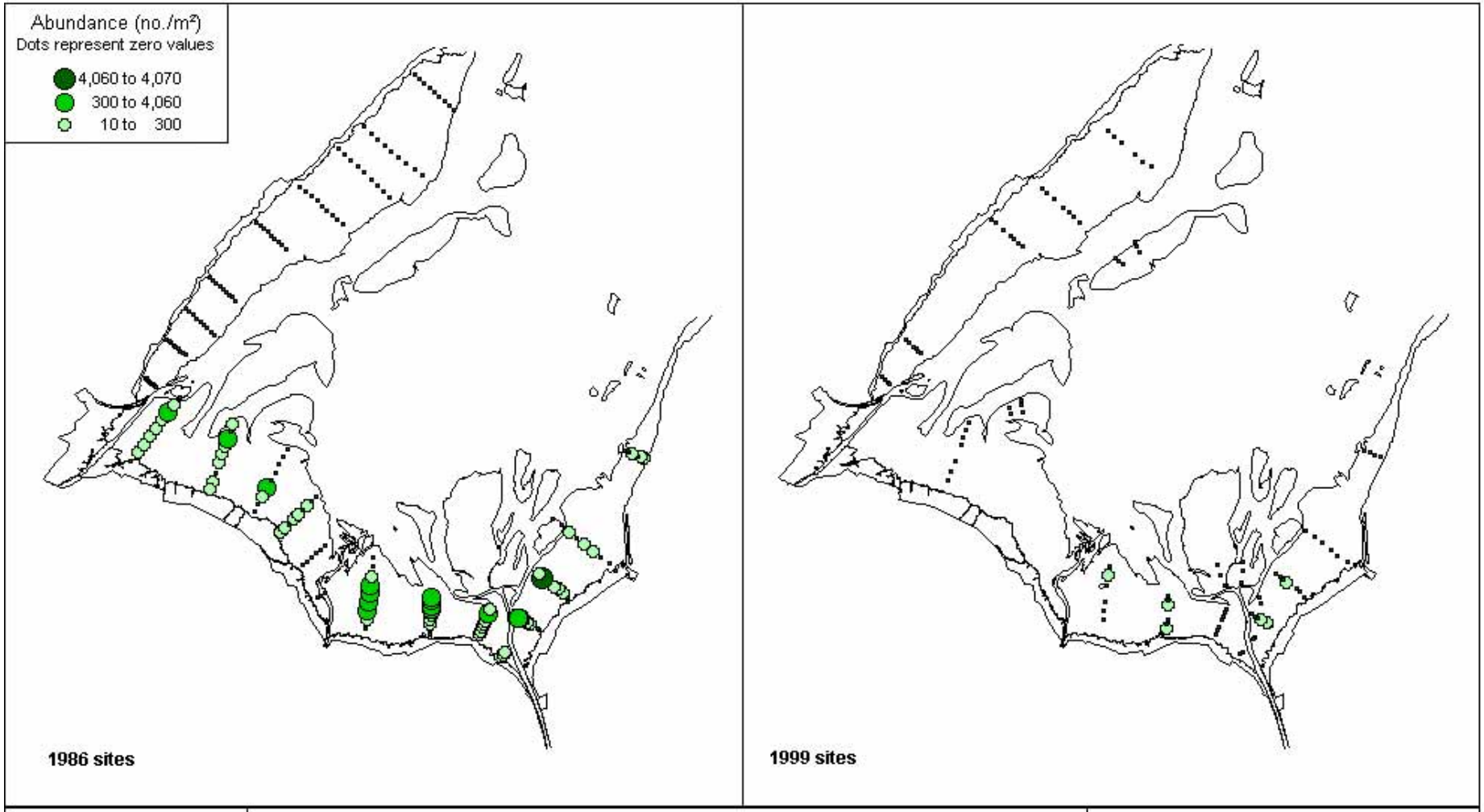


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**Figure 3.3.8m Mya arenaria distribution 1999 compared to 1986**
**Note not all sites sampled in 1986 were sampled in 1999**

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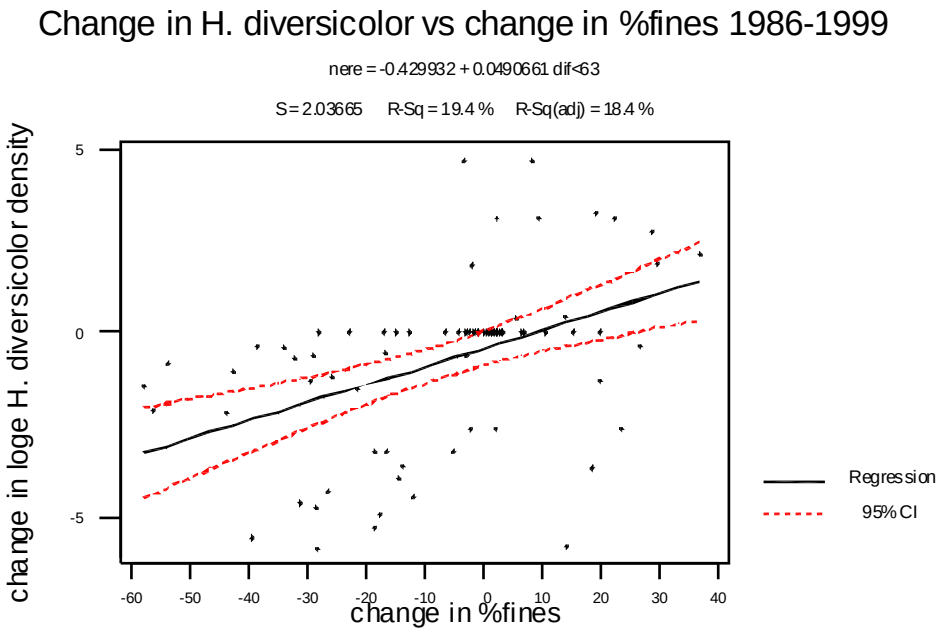
a. change in *Hediste diversicolor* density between 1986 and 1999 in relation to change in the percentage of fines (particles <63 µm) in the sediment.




b. change in *Arenicola marina* density between 1986 and 1999 in relation to the change in the percentage of fine sediment (%fines).

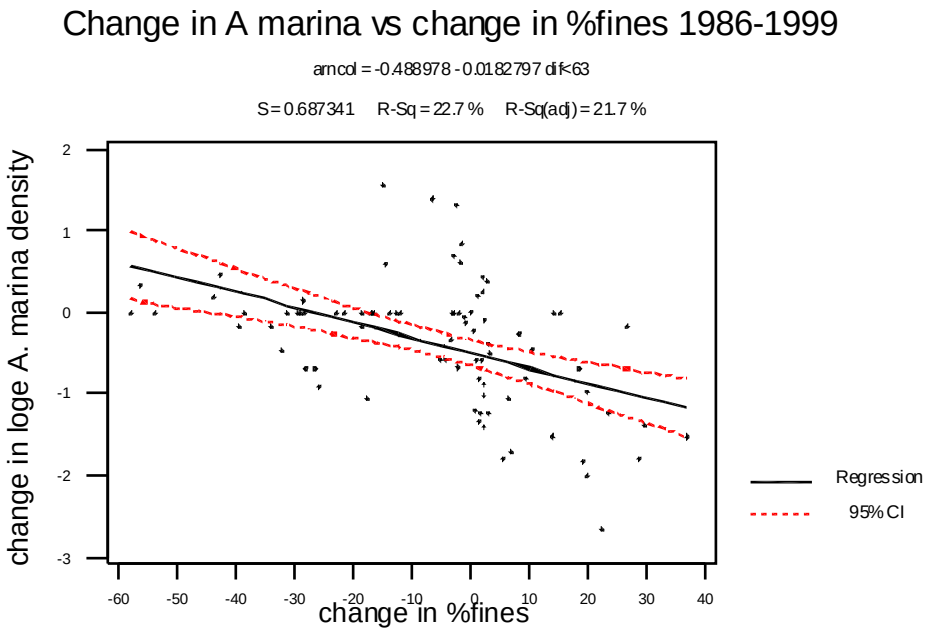
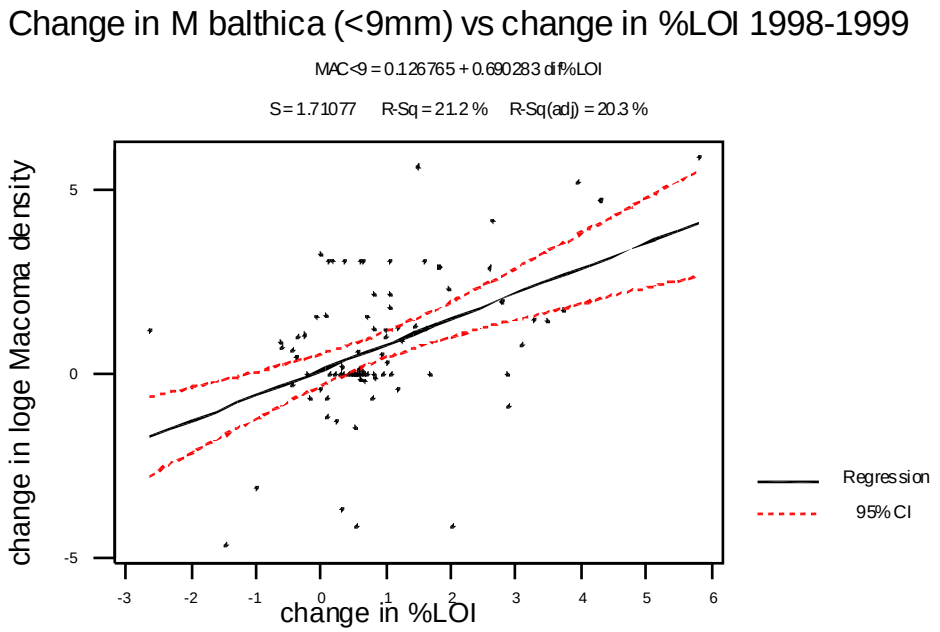


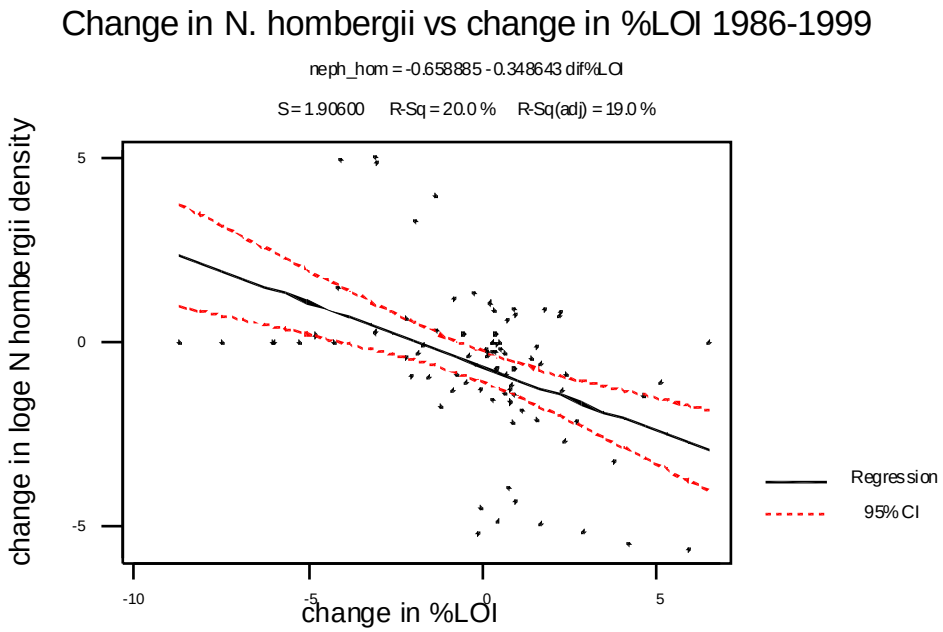

**Figure 3.3.9a-d. Examples of the relationship between the change in invertebrate density and the change in sediment. The fitted regression line and its 95% confidence interval are shown in each case.**

**Figure 3.3.9 continued**

c. change in *Macoma balthica* (<9 mm) density between 1998 and 1999 in relation to change in sediment organic content expressed as % Loss On Ignition.




d, change in *Nephtys hombergii* density between 1986 and 1999 in relation to change in sediment organic content (%LOI).



**Appendix 1. Details of sample site location in the 1998 and 1999 surveys. All bearings are relative to MAGNETIC NORTH. In the field sites were marked by either a post or cane placed at the upper shore left-hand corner of the 1ha site when viewed from an up-shore to down-shore direction.**

| Transect | | site number | OSGB easting | OSGB northing | Geographical location, transect bearings and site spacing |
|---|---|---|---|---|---|
| **Transect 2** | | | | | **Wainfleet Sand. Friskney** |
| | | | | | Transect within the RAF Wainfleet danger area |
| | post | 2.2 | 551582 | 353302 | At 1080m, bearing 135deg from a point on sea wall 500m NE of access road |
| | cane | 2.3 | 551938 | 352983 | 440m bearing 135deg from site 2.2 |
| | cane | 2.4 | 552284 | 352651 | 440m bearing 135deg from site 2.3 |
| | cane | 2.6 | 552997 | 352019 | 880m bearing 135deg from site 2.4 |
| | cane | 2.7 | 553347 | 351672 | 440m bearing 135deg from site 2.6 |
| | cane | 2.8 | 553845 | 351407 | 440m bearing 135deg from site 2.7 |
| **Transect 4** | | | | | **Friskney Flats. Wrangle** |
| | | | | | Transect within the RAF Wainfleet danger area |
| | post | 4.2 | 548188 | 350255 | At 670m, bearing 135deg from point on sea wall 500m NE of The Horseshoe |
| | cane | 4.3 | 548463 | 350011 | 360m bearing 135deg from site 4.2 |
| | cane | 4.4 | 548778 | 349736 | 360m bearing 135deg from site 4.3 |
| | cane | 4.6 | 549304 | 349249 | 720m bearing 135deg from site 4.4 |
| | cane | 4.7 | 549572 | 349016 | 360m bearing 135deg from site 4.6 |
| | cane | 4.8 | 549844 | 348765 | 360m bearing 135deg from site 4.7 |
| | cane | 4.9 | 550146 | 348499 | 360m bearing 135deg from site 4.8 |

## Appendix 1 continued

| | | | | | |
|---|---|---|---|---|---|
| **Long Sand** | | site | easting | northing | **Long Sand (outer bank)** |
| **south transect** | | | | | |
| | post | LS1 | 552399 | 346338 | 300m bearing 135deg from site LS2 |
| | cane | LS2 | 552167 | 346495 | 300m bearing 315deg from site LS1 |
| | cane | LS3 | 552018 | 346602 | 200m bearing 315deg from site LS2 |
| **north transect** | | | | | |
| | cane | LS4 | 553209 | 346920 | 350m bearing 153deg from site LS5 |
| | post | LS5 | 553090 | 347261 | 350m bearing 333deg from site LS4 |
| | cane | LS6 | 553009 | 347473 | 300m bearing 333deg from site LS5 |
| **Transect 5** | | | | | **Wrangle Flats. Wrangle** |
| | post | 5.1 | 545600 | 348632 | At 550m, bearing 135deg from style on sea wall |
| | cane | 5.2 | 545814 | 348459 | 260m bearing 135deg from site 5.1 |
| | cane | 5.4 | 546200 | 348113 | 520m bearing 135deg from site 5.2 |
| | cane | 5.6 | 546569 | 347766 | 520m bearing 135deg from site 5.4 |
| | cane | 5.7 | 546758 | 347602 | 260m bearing 135deg from site 5.6 |
| | cane | 5.8 | 546955 | 347420 | 260m bearing 135deg from site 5.7 |
| | cane | 5.9 | 547204 | 347221 | 260m bearing 135deg from site 5.8 |
| **Transect 7** | | | | | **Butterwick Low. Butterwick** |
| | post | 7.2 | 542130 | 343918 | At 600m, bearing 135deg from point on sea wall 900m NE of Butterwick Pullover |
| | cane | 7.4 | 542521 | 343580 | 480m bearing 135deg from site 7.2 |
| | cane | 7.6 | 542905 | 343236 | 480m bearing 135deg from site 7.4 |
| | cane | 7.7 | 543085 | 343069 | 240m bearing 135deg from site 7.6 |
| | cane | 7.8 | 543287 | 342890 | 240m bearing 135deg from site 7.7 |
| | cane | 7.9 | 543478 | 342718 | 240m bearing 135deg from site 7.8 |

## Appendix 1 continued

| | | site | easting | northing | |
|---|---|---|---|---|---|
| **Transect 8** | | | | | **Butterwick Low. Butterwick** |
| | post | 8.2 | 541115 | 342381 | At 500m, bearing 135deg from point on sea wall 900m SW of Butterwick Pullover |
| | cane | 8.4 | 541324 | 342181 | 320m bearing 135deg from site 8.2 |
| | cane | 8.6 | 541565 | 341968 | 320m bearing 135deg from site 8.4 |
| | cane | 8.7 | 541674 | 341870 | 160m bearing 135deg from site 8.6 |
| | cane | 8.8 | 541802 | 341763 | 160m bearing 135deg from site 8.7 |
| | cane | 8.9 | 541942 | 341673 | 160m bearing 135deg from site 8.8 |
| **Transect 9** | | | | | **Freiston Low. Freiston shore** |
| | post | 9.2 | 539905 | 340414 | At 300m, bearing 135deg from point on sea wall 1500m from bank running SE from Freiston Shore |
| | cane | 9.4 | 540046 | 340296 | 240m bearing 135deg from site 9.2 |
| | cane | 9.6 | 540187 | 340165 | 240m bearing 135deg from site 9.4 |
| | cane | 9.8 | 540334 | 340046 | 240m bearing 135deg from site 9.6 |
| **Transect 10** | | | | | **Herring Hill & Black Buoy Sand. Holbeach St Mark's** |
| | | | | | **CAUTION; ACCESS TO SITES FROM LAND IS DIFFICULT BECAUSE OF LARGE CHANNEL BETWEEN MARSH EDGE AND SITE 10.2** |
| | post | 10.2 | 539441 | 336536 | At 1350m, bearing 45deg from causeway at base of sea wall 1000m E of Anderson's Creek |
| | cane | 10.4 | 540093 | 337398 | 1066m bearing 45deg from site 10.2 |
| | cane | 10.6 | 540733 | 338243 | 1066m bearing 45deg from site 10.4 |
| | cane | 10.7 | 541032 | 338640 | 533m bearing 45deg from site 10.6 |
| | cane | 10.8 | 541362 | 339058 | 533m bearing 45deg from site 10.7 |
| | cane | 10.9 | 541672 | 339455 | 433m bearing 45deg from site 10.8 |

## Appendix 1 continued

| **Roger-Toft Sand** | | site | easting | northing | **Roger and Toft Sand (outer banks)** |
|---|---|---|---|---|---|
| **south transect** | | | | | transect aligned on bearing 135deg to beacon RAF No4 on Inner Gat Sand |
| | post | RT1 | 545016 | 339967 | At 300m, bearing 315deg to site RT2 |
| | cane | RT2 | 544755 | 340162 | 300m bearing 135deg to site RT1 |
| | cane | RT3 | 544512 | 340399 | 300m bearing 315deg to site RT2 |
| **north transect** | | | | | |
| | cane | RT4 | 545759 | 341150 | 250m bearing 315 deg to site RT5 |
| | post | RT5 | 545575 | 341185 | 250m bearing 135 deg to site RT4 |
| | cane | RT6 | 545284 | 341513 | 400m bearing 315 deg to site RT5 |
| | | | | | |
| **Transect 11** | | | | | **Mare Tail. Holbeach St Matthew** |
| | | | | | Transect within the RAF Holbeach danger area |
| | post | 11.2 | 543328 | 334989 | 28deg to beacon RAF 2A on Mare Tail and 105deg to RAF Target 8 on Old South |
| | cane | 11.3 | 543503 | 335500 | At 433m, bearing 28deg from site 11.2 |
| | cane | 11.4 | 543686 | 336025 | 433m bearing 28deg from site 11.3 |
| | cane | 11.6 | 543993 | 336890 | 533m bearing 118deg from beacon RAF 2A |
| | cane | 11.7 | 544120 | 337258 | 100m bearing 118deg from beacon RAF 2A |
| | cane | 11.8 | 544266 | 337682 | 333m bearing 28deg from beacon RAF 2A |
| | cane | 11.9 | 544409 | 338070 | 433m bearing 28deg from site 11.8 |

## Appendix 1 continued

| | | site | easting | northing | |
|---|---|---|---|---|---|
| **Gat Sand** | | | | | **Gat Sand (outer bank)** |
| **east transect** | | | | | Transect aligned on bearing 170deg to beacon RAF No4 on Inner Gat Sand |
| | cane | GS1 | 547087 | 339216 | At 300m, bearing 170deg from site GS2 |
| | cane | GS2 | 547136 | 338936 | 235m bearing 350deg from site GS3 |
| | post | GS3 | 547212 | 338582 | 235m bearing 350deg from site GS2 |
| **west transect** | | | | | |
| | post | GS4 | 546533 | 338533 | on bearing 39deg from site GS3 |
| | cane | GS5 | 546489 | 338825 | 400m bearing 350deg from site GS4 |
| | | | | | |
| **Transect 12** | | | | | **Old South and Main End. Holbeach St Matthew** |
| | | | | | Transect within the RAF Holbeach danger area |
| | post | 12.2 | 545707 | 333865 | At 1650m, bearing 35deg from point on sea wall 1000m from RAF Holbeach |
| | cane | 12.4 | 546143 | 334656 | 844m bearing 35deg from site 12.2 |
| | cane | 12.6 | 546591 | 335496 | 844m bearing 35deg from site 12.4 |
| | cane | 12.7 | 546815 | 335906 | 422m bearing 35deg from site 12.6 |
| | cane | 12.8 | 547027 | 336307 | 422m bearing 35deg from site 12.7 |
| | cane | 12.9 | 547250 | 336731 | 422m bearing 35deg from site 12.8 |
| | | | | | |
| **Transect 14** | | | | | **Dawsmere Creek area. Gedney Drove End** |
| | | | | | Transect within the RAF Holbeach danger area |
| | post | 14.1 | 548023 | 330622 | At 1050m, bearing 54deg from where footpath coming NE from Gedney Drove End meets sea wall |
| | cane | 14.2 | 548253 | 330820 | 333m bearing 54deg from site 14.1 |
| | cane | 14.4 | 548714 | 331255 | 666m bearing 54deg from site 14.2 |
| | cane | 14.5 | 548943 | 331449 | 333m bearing 54deg from site 14.4 |
| | cane | 14.6 | 549184 | 331677 | 333m bearing 54deg from site 14.5 |

## Appendix 1 continued

| | | site | easting | northing | |
|---|---|---|---|---|---|
| **Transect 15** | | | | | **Inner Westmark Knock. Sutton Bridge east of R Nene** |
| | post | 15.2 | 551349 | 327763 | At 1100m, bearing 10deg from point on sea wall 1700m from where wall turns east from R Nene |
| | cane | 15.3 | 551400 | 328232 | 489m bearing 10deg from site 15.2 |
| | cane | 15.4 | 551447 | 328713 | 489m bearing 10deg from site 15.3 |
| | cane | 15.6 | 551544 | 329560 | 978m bearing 10deg from site 15.4 |
| | cane | 15.7 | 551593 | 330055 | 489m bearing 10deg from site 15.6. (approx 100m SE of outer trial bank) |
| | cane | 15.8 | 551644 | 330541 | 489m bearing 10deg from site 15.7 |
| **Transect 16** | | | | | **Breast Sand. Terrington St Clement** |
| | post | 16.2 | 554630 | 327254 | At 875m, bearing 10deg from point on sea wall 200m E of track out to inner trial bank |
| | cane | 16.3 | 554647 | 327518 | 244m bearing 10deg from site 16.2 |
| | cane | 16.4 | 554655 | 327782 | 244m bearing 10deg from site 16.3 |
| | cane | 16.6 | 554682 | 328299 | 488m bearing 10deg from site 16.4 |
| | cane | 16.7 | 554698 | 328517 | 244m bearing 10deg from site 16.6 |
| | cane | 16.8 | 554715 | 328768 | 244m bearing 10deg from site 16.7 |
| | cane | 16.9 | 554722 | 328949 | 244m bearing 10deg from site 16.8 |
| **Transect 17** | | | | | **Breast Sand. Ongar Hill** |
| | post | 17.2 | 557194 | 326969 | At 450m, bearing 28deg from point where alignment of sea wall changes from NW-SE to W-E |
| | cane | 17.3 | 557279 | 327181 | 222m bearing 28deg from site 17.2 |
| | cane | 17.4 | 557354 | 327364 | 222m bearing 28deg from site 17.3 |
| | cane | 17.6 | 557501 | 327737 | 444m bearing 28deg from site 17.4 |
| | cane | 17.7 | 557582 | 327924 | 222m bearing 28deg from site 17.6 |
| | cane | 17.8 | 557649 | 328099 | 222m bearing 28deg from site 17.7 |
| | cane | 17.9 | 557741 | 328309 | 222m bearing 28deg from site 17.8 |

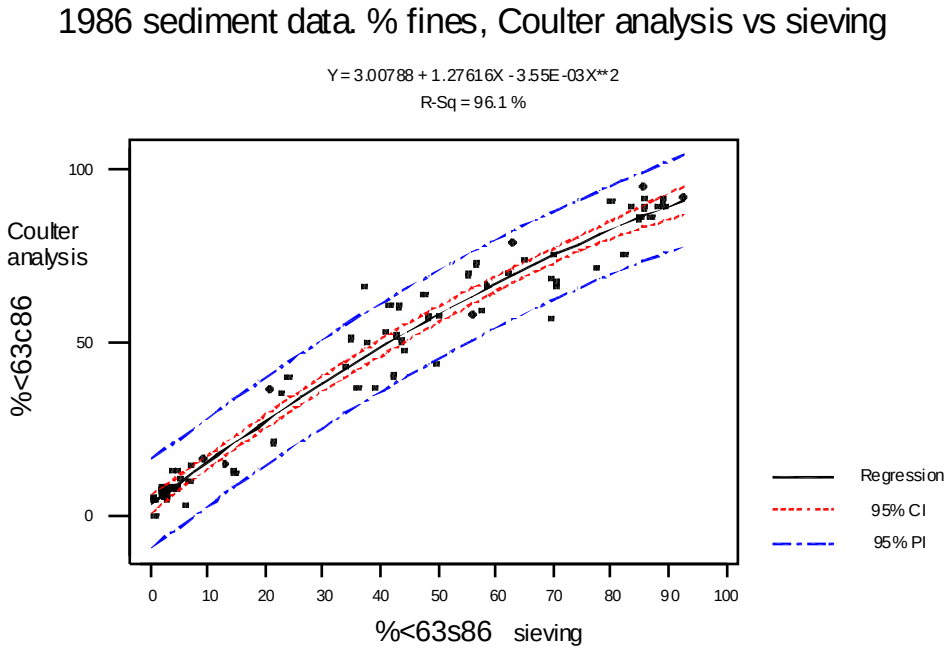
## Appendix 1 continued

| | | site | easting | northing | |
|---|---|---|---|---|---|
| **Transect B** | | | | | **Off Admiralty Point. Ongar hill** |
| | post | B.2 | 558436 | 325950 | At 600m, bearing 57deg from 90deg bend in sea wall at Admiralty Point |
| | cane | B.3 | 558543 | 326079 | 200m bearing 57deg from site b.2 |
| **Daseley's Sand** | | | | | **Daseley's Sand (outer bank)** |
| | post | D.2 | 557639 | 329536 | 600m bearing 165deg from site D.3 |
| | cane | D.3 | 557427 | 330087 | 600m bearing 345deg from site D.2 |
| | cane | D.4 | 557221 | 330620 | 600m bearing 345deg from site D.3 |
| **Pandora Sand** | | | | | **Pandora Sand (outer bank)** |
| | post | P.1 | 558509 | 329675 | 600m bearing 190deg from siteP.2 |
| | cane | P.2 | 558529 | 330268 | 600m bearing 10deg from site P.1 |
| | cane | P.3 | 558591 | 330779 | 500m bearing 10deg from site P.2 |
| **Transect C** | | | | | **Bulldog Sand. North Wootton** |
| | cane | C.2 | 559156 | 326812 | on bearing 268deg from projection in sea wall fronting Wootton Marsh |
| | cane | C.3 | 559082 | 326779 | 200m bearing 266deg from site C.2 |
| **Transect 18** | | | | | **Bulldog Sand. North Wootton** |
| | cane | 18.3 | 560050 | 327461 | At 1100m, bearing 303deg from projection in sea wall fronting Wootton Marsh |
| | cane | 18.4 | 559811 | 327581 | 200m bearing 303deg from site 18.3 |
| | cane | 18.6 | 559476 | 327732 | 400m bearing 303deg from site 18.4 |
| | cane | 18.7 | 559305 | 327823 | 200m bearing 303deg from site 18.6 |
| | cane | 18.8 | 559187 | 327882 | 200m bearing 303deg from site 18.7 |
| | cane | 18.9 | 559050 | 328046 | 200m bearing 303deg from site 18.8 |

## Appendix 1 continued

| | | site | easting | northing | |
|---|---|---|---|---|---|
| **Transect E** | | | | | **Bulldog Sand. North Wootton** |
| | post | E.8 | 559525 | 328614 | on bearing 320deg from projection in sea wall fronting Wootton Marsh |
| | cane | E.9 | 559392 | 328907 | At 250m, bearing 314 from site E.8 |
| **Transect 19** | | | | | **Bulldog & Peter Black Sands. Wolferton** |
| | post | 19.2 | 561761 | 328939 | At 110m, bearing 312deg from point on sea wall 2000m N of projection in sea wall at Wootton Marsh |
| | cane | 19.3 | 561530 | 329206 | 267m bearing 312deg from site 19.2 |
| | cane | 19.4 | 561330 | 329390 | 267m bearing 312deg from site 19.3 |
| | cane | 19.6 | 560833 | 329670 | 534m bearing 312deg from site 19.4 |
| | cane | 19.7 | 560629 | 329854 | 267m bearing 312deg from site 19.6 |
| | cane | 19.8 | 560482 | 329974 | 267m bearing 312deg from site 19.7 |
| | cane | 19.9 | 560266 | 330150 | 267m bearing 312deg from site 19.8 |
| **Transect 20** | | | | | **Peter Black & Ferrier Sands. Wolferton** |
| | post | 20.2 | 563950 | 330740 | At 1100m, bearing 318deg from corner of the sea wall opposite Wolferton Creek pumping station |
| | cane | 20.3 | 563450 | 331050 | 489m bearing 318deg from site 20.2 |
| | cane | 20.4 | 563090 | 331350 | 489m bearing 318deg from site 20.3 |
| | cane | 20.5 | 562650 | 331750 | 489m bearing 318deg from site 20.4 |
| | cane | 20.6 | 562250 | 332050 | 489m bearing 318deg from site 20.5 |
| | cane | 20.7 | 561850 | 332400 | 489m bearing 318deg from site 20.6 |
| **Transect 21** | | | | | **Stubborn Sand. Heacham** |
| | cane | 21.2 | 565700 | 336255 | At 267m, bearing 298deg from point on sea wall 300m S of southern-most beach chalet |
| | cane | 21.4 | 565400 | 336355 | 356m bearing 298deg from 21.2 |
| | cane | 21.6 | 565150 | 336495 | 356m bearing 298deg from 21.4 |
| | cane | 21.8 | 564850 | 336600 | 356m bearing 298deg from 21.6 |

**Appendix 2. A comparison between the percentage of fine sediment (particles <63 μm) determined by sieving and by a 'Coulter' particle size analyser. Each point relates to a sediment sample taken from 78 sites in the 1986 survey of the Wash that were originally analysed by sieving alone.**



**Appendix 3. The invertebrates recorded in the 1998 and 1999 surveys of the Wash and their frequency of occurrence in the sample sites. 118 sites were sampled in 1998 and 103 sites in 1999. The H&P code column refers to that given to the invertebrate in Howson, C. M. and Picton, B.E. *eds.*1997. *The species directory of the marine fauna and flora of the British Isles and surrounding areas.* Belfast, Ulster Museum and Ross-on-Wye, Marine Conservation Society.**

| Invertebrate | | Frequency of occurrence | | | |
|---|---|---|---|---|---|
| | | in 1998 (118 sites) | | in 1999 (103 sites) | |
| | H&P code | No. sites | % of sites | No. sites | % of sites |
| Nemertean indet | G1 | 4 | 3.4 | 16 | 15.5 |
| Tetrastemma longissimum | G129 | 6 | 5.1 | 0 | 0.0 |
| Nematode indet | HD1 | 35 | 29.7 | 38 | 36.9 |
| *Pholoe inornata* | P92 | 1 | 0.8 | 1 | 1.0 |
| Phyllodocid indet. | P114 | 1 | 0.8 | 1 | 1.0 |
| *Eteone flava* | P117 | 0 | 0.0 | 1 | 1.0 |
| *Eteone longa* | P118 | 93 | 78.8 | 75 | 72.8 |
| *Anaitides maculata* | P144 | 43 | 36.4 | 37 | 35.9 |
| *Eulalia viridis* | P161 | 3 | 2.5 | 6 | 5.8 |
| *Glycera tridactyla* | P265 | 2 | 1.7 | 3 | 2.9 |
| *Goniada maculata* | P271 | 1 | 0.8 | 0 | 0.0 |
| ?Syllid | P346 | 2 | 1.7 | 2 | 1.9 |
| *Hediste diversicolor* | P 462 | 25 | 21.2 | 31 | 30.1 |
| *Nephtys caeca* | P496 | 34 | 28.8 | 15 | 14.6 |
| *Nephtys cirrosa* | P498 | 11 | 9.3 | 11 | 10.7 |
| *Nephtys hombergii* | P499 | 81 | 68.6 | 75 | 72.8 |
| *Nephtys incisa* | P501 | 2 | 1.7 | 0 | 0.0 |
| *Nephtys* sp. indet. juv. | P494 | 6 | 5.1 | 3 | 2.9 |
| *Scoloplos armiger* | P672 | 56 | 47.5 | 45 | 43.7 |
| *Malacoceros fuliginosus* | P737 | 6 | 5.1 | 11 | 10.7 |
| *Malacoceros vulgaris* | P738 | 2 | 1.7 | 1 | 1.0 |
| *Polydora* sp. | P748 | 0 | 0.0 | 1 | 1.0 |
| *Pygospio elegans* | P776 | 87 | 73.7 | 78 | 75.7 |
| *Scolelepis squamata* | P783 | 8 | 6.8 | 0 | 0.0 |
| *Spio martinensis* | P790 | 51 | 43.2 | 52 | 50.5 |
| *Spiophanes bombyx* | P794 | 4 | 3.4 | 3 | 2.9 |
| *Magelona mirabilis* | P807 | 13 | 11.0 | 8 | 7.8 |
| *Aphelochaeta marioni* | P824 | 54 | 45.8 | 57 | 55.3 |
| *Capitella capitata* / sp.indet. | P907 | 43 | 36.4 | 40 | 38.8 |
| *Heteromastus filiformis* | P917 | 2 | 1.7 | 12 | 11.7 |
| *Notomastus* sp. | P920 | 5 | 4.2 | 1 | 1.0 |
| *Notomastus latericeus* | P921 | 1 | 0.8 | 1 | 1.0 |
| *Arenicola marina* | P931 | 68 | 57.6 | 48 | 46.6 |
| *Heteroclymene robusta* | P967 | 9 | 7.6 | 11 | 10.7 |
| *Ampharete grubei* | P1138 | 0 | 0.0 | 11 | 10.7 |
| *Lanice conchilega* | P1194 | 20 | 16.9 | 15 | 14.6 |
| Oligochaeta | P1402 | 47 | 39.8 | 2 | 1.9 |
| ?*Tubificoides benedii* | P1490 | 13 | 11.0 | 58 | 56.3 |
| Enchytraeidae | P1501 | 0 | 0.0 | 4 | 3.9 |
| *Elminius modestus* | R68 | 1 | 0.8 | 0 | 0.0 |
| *Balanus balanus* | R76 | 1 | 0.8 | 3 | 2.9 |
| ?*Pontocypris mytiloides* | R2707 | 0 | 0.0 | 1 | 1.0 |
| ?*Propontocypris trigonella* | R2710 | 0 | 0.0 | 0 | 0.0 |
| Copepod indet | R142 | 11 | 9.3 | 0 | 0.0 |
| *Urothoe poseidonis* | S250 | 15 | 12.7 | 25 | 24.3 |

| Invertebrate | | Frequency of occurrence in 1998 (118 sites) | | in 1999 (103 sites) | |
|---|---|---|---|---|---|
| | H&P code | No. sites | % of sites | No. sites | % of sites |
| *Bathyporeia pelagica* | S456 | 3 | 2.5 | 0 | 0.0 |
| *Bathyporeia pilosa* | S457 | 1 | 0.8 | 1 | 1.0 |
| *Bathyporeia sarsi* | S458 | 40 | 33.9 | 24 | 23.3 |
| *Haustorius arenarius* | S462 | 5 | 4.2 | 0 | 0.0 |
| *Gammarus* indet | S471 | 4 | 3.4 | 0 | 0.0 |
| *Gammarus locusta* | S478 | 4 | 3.4 | 2 | 1.9 |
| *Corophium arenarium* | S609 | 15 | 12.7 | 6 | 5.8 |
| *Corophium volutator* | S616 | 33 | 28.0 | 37 | 35.9 |
| *Cyathura carinata* | S805 | 8 | 6.8 | 7 | 6.8 |
| *Idotea linearis* | S939 | 1 | 0.8 | 0 | 0.0 |
| *Tanaissus lilljeborgi* | S1169 | 25 | 21.2 | 18 | 17.5 |
| Cumacean indet. | S1183 | 9 | 7.6 | 17 | 16.5 |
| All Cumaceans | S1183 | 31 | 26.3 | 34 | 33.0 |
| *Vauntomsonia cristata* | S1190 | 1 | 0.8 | 9 | 8.7 |
| *Bodotria arenosa* | S1194 | 20 | 16.9 | 4 | 3.9 |
| *Bodotria pulchella* | S1196 | 1 | 0.8 | 0 | 0.0 |
| *Pseudocuma longicornis* | S1236 | 0 | 0.0 | 15 | 14.6 |
| *Crangon crangon* | S1385 | 43 | 36.4 | 43 | 41.7 |
| *Carcinus maenas* | S1594 | 15 | 12.7 | 8 | 7.8 |
| Collembola | | 3 | 2.5 | 0 | 0.0 |
| *Isotoma maritima* | | 0 | 0.0 | 4 | 3.9 |
| *Anurida maritima* | | 1 | 0.8 | 0 | 0.0 |
| *Atheta* sp. | | 0 | 0.0 | 1 | 1.0 |
| ?*Hydrophorus oceanus* larvae | | 11 | 9.3 | 13 | 12.6 |
| ?*Machaerium maritimum* larvae | | 1 | 0.8 | 1 | 1.0 |
| Mite indet. | Q53 | 2 | 1.7 | 1 | 1.0 |
| *Leptochiton asellus* | W53 | 0 | 0.0 | 1 | 1.0 |
| *Littorina* sp | W294 | 2 | 1.7 | 8 | 7.8 |
| *Hydrobia ulvae* | W385 | 90 | 76.3 | 70 | 68.0 |
| *Retusa obtusa* | W1077 | 33 | 28.0 | 16 | 15.5 |
| *Alderia modesta* | W1127 | 0 | 0.0 | 2 | 1.9 |
| *Mytilus edulis* | W1695 | 49 | 41.5 | 36 | 35.0 |
| *Mysella bidentata* | W1906 | 8 | 6.8 | 5 | 4.9 |
| *Cerastoderma edule* | W1961 | 81 | 68.6 | 62 | 60.2 |
| *Ensis* sp. | W1996 | 1 | 0.8 | 0 | 0.0 |
| *Ensis arcuatus* | W1998 | 14 | 11.9 | 0 | 0.0 |
| *Ensis ensis* | W1999 | 1 | 0.8 | 0 | 0.0 |
| *Tellina tenuis* | W2012 | 2 | 1.7 | 0 | 0.0 |
| *Fabulina fabula* | W2019 | 6 | 5.1 | 6 | 5.8 |
| *Macoma balthica* | W2029 | 73 | 61.9 | 72 | 69.9 |
| *Mya truncata* | W2147 | 1 | 0.8 | 1 | 1.0 |
| *Mya arenaria* | W2149 | 13 | 11.0 | 6 | 5.8 |
| *Abra nitida* | W2061 | 1 | 0.8 | 1 | 1.0 |
| *Scrobicularia plana* | W2068 | 63 | 53.4 | 31 | 30.1 |

**Appendix 4. The sediment characteristics and surface features of the 1998 and 1999 sample sites. Sediment particle size is expressed as % particles <63 microns (fines) and categorised as mud (>50% fines), muddy sand (30-50% fines) and sand (<30% fines). Sediment features are those specified in the Procedural Guidelines and are scored 1-5 in the manner:- surface relief; even-uneven, firmness; firm-soft, stability; stable-mobile, sorting; well-poor and black layer depth 1= not visible, 2=>20cm, 3=5-20cm, 4=1-5cm and 5=<1cm.**

Sites sampled in 1998

| transect.site 1998 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 2.2 | 12.6 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 2.4 | 8.7 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 2.6 | 9.1 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 2.7 | 8.9 | SAND | 2 | 1 | 2 | 1 | 4 | casts, tubes, ripples,standing water |
| 2.8 | 6.4 | SAND | 2 | 2 | 3 | 1 | 1 | casts, ripples, drainage creek,standing water |
| 4.2 | 12.0 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 4.4 | 10.0 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.6 | 9.8 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.7 | 8.4 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.8 | 6.2 | SAND | 2 | 1 | 3 | 1 | 3 | casts, ripples, drainage creek,standing water |
| 4.9 | 6.2 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples |
| Long Sand.1 | 11.7 | SAND | 2 | 1 | 3 | 2 | 3 | casts, ripples,standing water |
| Long Sand.2 | 9.7 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| Long Sand.3 | 9.4 | SAND | 1 | 1 | 2 | 1 | 3 | tubes, standing water |
| Long Sand.4 | 11.0 | SAND | 2 | 2 | 3 | 2 | 3 | casts, ripples,standing water |
| Long Sand.5 | 11.1 | SAND | 2 | 1 | 2 | 2 | 3 | casts, ripples,standing water |
| Long Sand.6 | 9.2 | SAND | 2 | 1 | 2 | 1 | 3 | ripples,standing water |
| 5.2 | 12.4 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 5.4 | 8.5 | SAND | 2 | 1 | 2 | 1 | 3 | casts, ripples,standing water |
| 5.6 | 7.5 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| 5.7 | 7.3 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| 5.8 | 8.6 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| 5.9 | 7.0 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| 7.2 | 25.5 | SAND | 5 | 2 | 1 | 3 | 4 | casts, burrows, drainage creeks, standing water, subsurface mud |
| 7.4 | 48.3 | MUDDYSAND | 4 | 2 | 2 | 3 | 4 | casts, burrows, drainage creeks, standing water |
| 7.6 | 9.1 | SAND | 2 | 1 | 1 | 1 | 4 | casts, ripples,standing water |
| 7.7 | 9.3 | SAND | 2 | 1 | 1 | 1 | 4 | casts, ripples, drainage creek,standing water |
| 7.8 | 8.5 | SAND | 2 | 1 | 1 | 1 | 4 | casts, ripples,standing water |
| 7.9 | 8.1 | SAND | 2 | 2 | 3 | 1 | 1 | casts, ripples,standing water |

| transect.site 1998 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 8.2 | 28.2 | SAND | 4 | 3 | 2 | 3 | 4 | casts, ripples,standing water, subsurface mud |
| 8.4 | 60.4 | MUD | 5 | 3 | 3 | 5 | 4 | burrows, drainage creeks, standing water |
| 8.7 | 8.0 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 8.8 | 7.8 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 8.9 | 7.9 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 10.2 | 71.4 | MUD | 4 | 3 | 2 | 4 | 5 | mounds, burrows, drainage creeks, standing water |
| 10.4 | 35.8 | MUDDYSAND | 3 | 3 | 3 | 4 | 4 | casts, ripples,standing water |
| 10.6 | 62.6 | MUD | 1 | 5 | 3 | 4 | 5 | drainage channels |
| 10.7 | 51.9 | MUD | 1 | 5 | 3 | 4 | 4 | |
| 10.8 | 31.9 | MUDDYSAND | 3 | 2 | 2 | 4 | 4 | casts, algal mat, standing water |
| 10.9 | 60.8 | MUD | 5 | 4 | 3 | 5 | 4 | algal mat, drainage channels, standing water |
| Roger Toft.1 | 8.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples |
| Roger Toft.2 | 21.2 | SAND | 3 | 2 | 3 | 3 | 4 | casts, tubes, ripples, standing water |
| Roger Toft.3 | 57.3 | MUD | 3 | 4 | 4 | 4 | 4 | scattered mussels, tubes, standing water |
| Roger Toft.4 | 9.0 | SAND | 2 | 2 | 3 | 1 | 4 | casts, ripples, standing water |
| Roger Toft.5 | 24.2 | SAND | 2 | 3 | 3 | 3 | 4 | ripples,standing water |
| Roger Toft.6 | 42.8 | MUDDYSAND | 4 | 4 | 4 | 4 | 4 | scattered mussels, tubes, standing water |
| 11.2 | 51.3 | MUD | 3 | 3 | 3 | 4 | 4 | casts, ripples, standing water |
| 11.4 | 46.5 | MUDDYSAND | 1 | 4 | 3 | 4 | 4 | scattered mussels, standing water |
| 11.6 | 73.8 | MUD | 4 | 5 | 3 | 5 | 4 | scattered mussels, algal mat, standing water |
| 11.7 | 67.6 | MUD | 4 | 5 | 3 | 5 | 5 | scattered mussels, algal mat, standing water |
| 11.8 | 47.5 | MUDDYSAND | 3 | 2 | 3 | 3 | 4 | casts, ripples, standing water |
| 11.9 | 69.7 | MUD | 3 | 3 | 3 | 5 | 4 | tubes, standing water |
| Gat Sand.1 | 69.5 | MUD | 5 | 5 | 3 | 5 | 5 | scattered mussels, standing water |
| Gat Sand.2 | 10.8 | SAND | 2 | 2 | 3 | 2 | 4 | ripples,standing water |
| Gat Sand.3 | 44.0 | MUDDYSAND | 3 | 4 | 4 | 4 | 4 | tubes, standing water |
| Gat Sand.4 | 12.2 | SAND | 2 | 2 | 4 | 2 | 4 | casts, ripples, standing water, subsurface coarse layer |
| Gat Sand.5 | 32.0 | MUDDYSAND | 2 | 4 | 4 | 4 | 4 | tubes, ripples, standing water, subsurface mud |
| 12.2 | 70.0 | MUD | 4 | 3 | 2 | 5 | 5 | drainage channels, standing water |
| 12.4 | 29.7 | SAND | 3 | 3 | 3 | 4 | 4 | casts, ripples, drainage creek,standing water |
| 12.6 | 8.2 | SAND | 2 | 2 | 2 | 1 | 4 | casts, ripples, standing water |
| 12.7 | 14.9 | SAND | 2 | 2 | 3 | 2 | 4 | casts, tubes, ripples, standing water, subsurface mud |
| 12.8 | 10.0 | SAND | 2 | 1 | 3 | 1 | 3 | casts, ripples, standing water, subsurface coarse layer |
| 12.9 | 7.2 | SAND | 2 | 2 | 3 | 1 | 1 | ripples, standing water, subsurface coarse layer |
| 14.1 | 43.3 | MUDDYSAND | 3 | 3 | 2 | 4 | 4 | casts, drainage channels, standing water, subsurface mud |
| 14.2 | 17.2 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water |

| transect.site 1998 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 14.4 | 11.9 | SAND | 2 | 1 | 3 | 2 | 4 | casts, ripples, standing water |
| 14.5 | 11.5 | SAND | 2 | 1 | 3 | 2 | 4 | casts, ripples, standing water |
| 14.6 | 8.1 | SAND | 2 | 3 | 4 | 1 | 4 | casts, ripples, standing water, subsurface mud |
| 15.2 | 49.5 | MUDDYSAND | 2 | 3 | 3 | 4 | 4 | casts, ripples, standing water, subsurface mud |
| 15.4 | 32.1 | MUDDYSAND | 2 | 3 | 3 | 3 | 4 | casts, ripples, standing water, subsurface mud |
| 15.6 | 15.3 | SAND | 3 | 3 | 4 | 2 | 4 | casts, tubes, ripples, drainage creek, standing water, subsurface mud |
| 15.7 | 16.5 | SAND | 2 | 3 | 4 | 2 | 5 | tubes, ripples, standing water, surface flocculant |
| 15.8 | 12.0 | SAND | 2 | 2 | 2 | 2 | 4 | casts, ripples, standing water |
| 16.2 | 67.0 | MUD | 5 | 3 | 2 | 4 | 4 | drainage channels, standing water |
| 16.3 | 66.9 | MUD | 5 | 3 | 3 | 5 | 4 | drainage channels, standing water |
| 16.4 | 49.2 | MUDDYSAND | 4 | 3 | 3 | 4 | 5 | drainage channels, standing water |
| 16.6 | 65.2 | MUD | 3 | 4 | 3 | 5 | 5 | drainage channels, standing water |
| 16.7 | 68.0 | MUD | 3 | 4 | 4 | 5 | 5 | drainage channels, standing water |
| 16.8 | 44.3 | MUDDYSAND | 3 | 5 | 4 | 4 | 5 | drainage channels, standing water |
| 16.9 | 83.0 | MUD | 3 | 5 | 4 | 5 | 5 | tubes, scattered mussels, standing water |
| 17.2 | 85.8 | MUD | 4 | 2 | 2 | 4 | 5 | drainage channels, standing water |
| 17.3 | 67.9 | MUD | 2 | 4 | 4 | 5 | 5 | ripples, standing water, |
| 17.4 | 45.9 | MUDDYSAND | 3 | 3 | 4 | 4 | 5 | drainage channels, standing water |
| 17.6 | 23.0 | SAND | 2 | 4 | 4 | 3 | 4 | casts, ripples, standing water |
| 17.7 | 24.4 | SAND | 2 | 3 | 4 | 3 | 4 | casts, standing water |
| 17.8 | 13.5 | SAND | 2 | 4 | 4 | 3 | 4 | tubes, ripples, standing water, surface flocculant |
| 17.9 | 32.3 | MUDDYSAND | 2 | 3 | 4 | 4 | 5 | ripples, standing water, surface flocculant |
| Daseley's Sand.2 | 5.7 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples |
| Daseley's Sand.3 | 10.7 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water |
| Daseley's Sand.4 | 11.1 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water |
| Pandora Sand.1 | 8.4 | SAND | 3 | 3 | 4 | 1 | 4 | ripples, standing water, subsurface mud |
| Pandora Sand.2 | 7.0 | SAND | 2 | 2 | 2 | 1 | 4 | ripples, standing water |
| Pandora Sand.3 | 6.7 | SAND | 2 | 2 | 2 | 1 | 4 | ripples, standing water |
| B.2 | 60.1 | MUD | 3 | 2 | 1 | 4 | 5 | drainage channels, standing water |
| B.3 | 75.5 | MUD | 4 | 3 | 2 | 5 | 5 | algal mat, drainage channels, standing water |
| C.2 | 34.6 | MUDDYSAND | 2 | 3 | 3 | 4 | 5 | standing water, subsurface mud |
| C.3 | 52.0 | MUD | 3 | 5 | 4 | 5 | 4 | drainage channels, standing water |
| 18.3 | 76.1 | MUD | 3 | 4 | 3 | 5 | 4 | drainage channels, standing water |
| 18.4 | 42.8 | MUDDYSAND | 3 | 4 | 4 | 4 | 4 | standing water, subsurface mud |
| 18.6 | 26.9 | SAND | 1 | 3 | 3 | 3 | 4 | ripples, standing water |
| 18.7 | 19.6 | SAND | 1 | 3 | 3 | 3 | 4 | casts, ripples, standing water |

| transect.site 1998 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 18.8 | 31.6 | MUDDYSAND | 2 | 4 | 4 | 4 | 4 | ripples, standing water |
| 18.9 | 35.5 | MUDDYSAND | 1 | 5 | 5 | 4 | 4 | ripples, subsurface mud |
| E.8 | 4.5 | SAND | 2 | 2 | 3 | 1 | 4 | ripples, standing water, subsurface mud |
| E.9 | 37.8 | MUDDYSAND | 2 | 4 | 4 | 4 | 4 | ripples, subsurface mud |
| 19.2 | 33.9 | MUDDYSAND | 3 | 3 | 2 | 4 | 1 | drainage channels, standing water |
| 19.3 | 16.4 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water |
| 19.4 | 16.5 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water, subsurface mud |
| 19.6 | 21.3 | SAND | 2 | 2 | 3 | 2 | 5 | casts, ripples, standing water, subsurface mud |
| 19.7 | 8.2 | SAND | 3 | 3 | 3 | 1 | 4 | casts, ripples, standing water |
| 19.8 | 22.9 | SAND | 3 | 3 | 3 | 2 | 4 | ripples, standing water |
| 19.9 | 53.3 | MUD | 2 | 4 | 4 | 4 | 5 | ripples, standing water, subsurface mud |
| 20.2 | 62.0 | MUD | 3 | 3 | 2 | 5 | 5 | drainage channels, standing water |
| 20.3 | 23.6 | SAND | 3 | 3 | 3 | 2 | 4 | drainage channels, standing water |
| 20.4 | 10.4 | SAND | 2 | 3 | 4 | 1 | 4 | casts, ripples, standing water |
| 20.5 | 11.3 | SAND | 2 | 2 | 4 | 1 | 4 | casts, ripples, standing water |
| 20.6 | 5.5 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples, standing water |
| 20.7 | 5.3 | SAND | 2 | 1 | 3 | 1 | 4 | casts, ripples, standing water |

**Appendix 4 continued**
Sites sampled in 1999

| transect.site 1999 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 2.2 | 11.9 | SAND | 2 | 1 | 2 | 2 | 3 | casts, ripples,standing water |
| 2.3 | 9.7 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 2.4 | 12.1 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 2.6 | 9.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 2.7 | 11.5 | SAND | 2 | 1 | 2 | 1 | 3 | casts, tubes, ripples,standing water |
| 2.8 | 8.5 | SAND | 2 | 2 | 3 | 1 | 1 | casts, ripples, drainage creek,standing water |
| 4.2 | 9.3 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 4.3 | 9.2 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.4 | 12.2 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.6 | 8.6 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.7 | 8.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 4.8 | 9.4 | SAND | 2 | 1 | 3 | 1 | 3 | casts, ripples, drainage creek,standing water |
| 4.9 | 6.8 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples |
| Long Sand.1 | 14.6 | SAND | 2 | 1 | 3 | 2 | 4 | ripples,standing water |
| Long Sand.2 | 10.7 | SAND | 2 | 1 | 2 | 1 | 4 | tubes, ripples,standing water |
| Long Sand.3 | 9.6 | SAND | 1 | 1 | 2 | 1 | 4 | tubes, standing water |
| Long Sand.4 | 16.1 | SAND | 2 | 2 | 3 | 2 | 4 | ripples,standing water |
| Long Sand.5 | 15.2 | SAND | 2 | 1 | 2 | 2 | 4 | ripples,standing water |
| Long Sand.6 | 11.0 | SAND | 2 | 1 | 2 | 1 | 4 | ripples,standing water |
| 5.1 | 14.0 | SAND | 1 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 5.2 | 14.1 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples,standing water |
| 5.4 | 11.4 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 5.6 | 13.9 | SAND | 2 | 1 | 2 | 1 | 4 | casts, tubes, ripples,standing water |
| 5.7 | 13.0 | SAND | 2 | 1 | 2 | 1 | 4 | casts, tubes, ripples,standing water |
| 5.8 | 17.8 | SAND | 2 | 1 | 2 | 2 | 4 | casts, tubes, ripples,standing water |
| 5.9 | 10.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, tubes, ripples,standing water |
| 8.2 | 28.8 | SAND | 4 | 3 | 2 | 3 | 4 | casts, ripples,standing water, subsurface mud |
| 8.4 | 51.7 | MUD | 5 | 3 | 3 | 5 | 4 | burrows, drainage creeks, standing water |
| 8.7 | 8.4 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 8.8 | 8.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 8.9 | 8.1 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples,standing water |
| 9.2 | 70.3 | MUD | 5 | 2 | 2 | 4 | 5 | burrows, drainage channels, algal mat, standing water |

| transect.site 1999 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| 9.4 | 70.0 | MUD | 5 | 3 | 3 | 5 | 4 | ripples, algal mat, standing water |
| 9.6 | 56.1 | MUD | 3 | 3 | 3 | 5 | 5 | scattered mussels, ripples, standing water |
| 9.8 | 43.1 | MUDDYSAND | 1 | 4 | 4 | 5 | 4 | casts, tubes, standing water |
| 11.2 | 59.2 | MUD | 3 | 3 | 3 | 4 | 4 | drainage channels, ripples, standing water |
| 11.3 | 52.7 | MUD | 2 | 3 | 3 | 5 | 4 | ripples, standing water |
| 11.4 | 47.9 | MUDDYSAND | 2 | 3 | 3 | 4 | 4 | scattered mussels, standing water |
| 11.6 | 74.2 | MUD | 4 | 5 | 3 | 5 | 4 | scattered mussels, algal mat, standing water |
| 11.7 | 56.9 | MUD | 4 | 5 | 3 | 5 | 4 | scattered mussels, algal mat, standing water |
| 11.8 | 41.5 | MUDDYSAND | 3 | 2 | 3 | 3 | 4 | tubes, ripples, standing water |
| 11.9 | 67.9 | MUD | 3 | 3 | 3 | 5 | 4 | scattered mussels, tubes, standing water |
| Gat Sand.1 | 78.4 | MUD | 5 | 5 | 3 | 5 | 5 | scattered mussels, standing water |
| Gat Sand.2 | 14.6 | SAND | 2 | 2 | 3 | 2 | 4 | ripples,standing water |
| Gat Sand.3 | 16.3 | SAND | 1 | 4 | 4 | 4 | 4 | tubes, standing water |
| Gat Sand.4 | 11.8 | SAND | 2 | 2 | 4 | 2 | 4 | ripples, standing water, subsurface coarse layer |
| Gat Sand.5 | 19.7 | SAND | 2 | 4 | 4 | 4 | 4 | ripples, standing water, subsurface mud |
| 15.2 | 64.0 | MUD | 3 | 3 | 3 | 4 | 5 | drainage channels, ripples, standing water |
| 15.3 | 56.6 | MUD | 3 | 3 | 3 | 4 | 4 | ripples, standing water |
| 15.4 | 55.1 | MUD | 2 | 3 | 3 | 4 | 4 | ripples, standing water, |
| 15.6 | 53.3 | MUD | 3 | 3 | 4 | 4 | 4 | ripples, drainage creek, standing water |
| 15.7 | 63.0 | MUD | 2 | 3 | 4 | 4 | 4 | tubes, ripples, standing water |
| 15.8 | 6.9 | SAND | 2 | 1 | 2 | 2 | 4 | casts, ripples, standing water |
| 16.2 | 87.0 | MUD | 5 | 3 | 2 | 4 | 5 | drainage channels, standing water |
| 16.3 | 82.6 | MUD | 5 | 3 | 3 | 4 | 5 | drainage channels, standing water |
| 16.4 | 60.1 | MUD | 4 | 3 | 3 | 5 | 5 | drainage channels, standing water |
| 16.6 | 70.4 | MUD | 3 | 4 | 3 | 5 | 5 | drainage channels, standing water |
| 16.7 | 80.4 | MUD | 3 | 4 | 4 | 5 | 5 | drainage channels, standing water |
| 16.8 | 81.0 | MUD | 3 | 5 | 4 | 4 | 5 | drainage channels, standing water |
| 17.2 | 88.1 | MUD | 4 | 2 | 2 | 4 | 5 | *Spartina* clumps, burrows, drainage channels, standing water |
| 17.3 | 77.2 | MUD | 3 | 4 | 4 | 5 | 5 | standing water, |
| 17.4 | 71.3 | MUD | 3 | 4 | 4 | 4 | 5 | drainage channels, standing water |
| 17.6 | 42.6 | MUDDYSAND | 2 | 3 | 4 | 5 | 4 | ripples, standing water, |
| 17.7 | 48.9 | MUDDYSAND | 2 | 3 | 4 | 5 | 4 | ripples, standing water, |
| 17.8 | 42.5 | MUDDYSAND | 2 | 3 | 4 | 5 | 4 | casts, ripples, standing water, |
| 17.9 | 73.5 | MUD | 2 | 3 | 4 | 4 | 5 | drainage channels, ripples, standing water |
| Daseley's Sand.2 | 35.1 | MUDDYSAND | 2 | 3 | 3 | 4 | 4 | ripples, standing water |
| Daseley's Sand.3 | 29.0 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water |

| transect.site 1999 | % fines | sediment category | Surface relief | Firmness | Stability | Sorting | Black layer depth | other surface features |
|---|---|---|---|---|---|---|---|---|
| Daseley's Sand.4 | 11.3 | SAND | 2 | 1 | 3 | 2 | 4 | casts, tubes, ripples, standing water |
| Pandora Sand.1 | 45.1 | MUDDYSAND | 3 | 3 | 4 | 4 | 4 | ripples, standing water, subsurface mud |
| Pandora Sand.2 | 14.9 | SAND | 2 | 2 | 2 | 1 | 4 | casts, ripples, standing water |
| Pandora Sand.3 | 13.4 | SAND | 2 | 3 | 3 | 1 | 4 | ripples, standing water |
| B.2 | 90.0 | MUD | 4 | 2 | 1 | 4 | 5 | drainage channels, standing water |
| B.3 | 86.5 | MUD | 4 | 3 | 2 | 5 | 5 | drainage channels, standing water |
| C.2 | 48.8 | MUDDYSAND | 2 | 3 | 3 | 4 | 5 | standing water, subsurface mud |
| C.3 | 69.6 | MUD | 3 | 5 | 4 | 5 | 4 | drainage channels, standing water, algae |
| 18.3 | 59.3 | MUD | 2 | 4 | 3 | 5 | 4 | standing water |
| 18.4 | 50.0 | MUDDYSAND | 3 | 4 | 4 | 4 | 4 | ripples, standing water, subsurface mud |
| 18.6 | 25.1 | SAND | 1 | 3 | 3 | 3 | 4 | casts, ripples, standing water |
| 18.7 | 35.3 | MUDDYSAND | 2 | 3 | 3 | 3 | 4 | casts, ripples, standing water |
| 18.8 | 42.7 | MUDDYSAND | 1 | 4 | 4 | 4 | 4 | ripples, standing water |
| 18.9 | 58.0 | MUD | 1 | 5 | 5 | 4 | 4 | ripples, subsurface mud |
| E.8 | 31.9 | MUDDYSAND | 2 | 3 | 3 | 1 | 4 | casts, ripples, standing water, subsurface mud, surface flocculant |
| E.9 | 54.8 | MUD | 2 | 4 | 4 | 4 | 4 | ripples, subsurface mud |
| 19.2 | 54.1 | MUD | 1 | 3 | 2 | 4 | 5 | casts, standing water |
| 19.3 | 38.3 | MUDDYSAND | 2 | 2 | 3 | 3 | 4 | casts, ripples, standing water, subsurface mud |
| 19.4 | 29.6 | SAND | 2 | 2 | 3 | 2 | 4 | casts, ripples, standing water, subsurface mud |
| 19.6 | 31.3 | SAND | 1 | 1 | 3 | 2 | 5 | casts, ripples, standing water, subsurface mud |
| 19.7 | 28.8 | SAND | 2 | 3 | 3 | 1 | 4 | casts, ripples, standing water |
| 19.8 | 47.7 | MUDDYSAND | 3 | 3 | 3 | 2 | 4 | casts, ripples, standing water |
| 20.2 | 82.5 | MUD | 3 | 3 | 2 | 5 | 5 | drainage channels, standing water |
| 20.3 | 50.7 | MUDDYSAND | 3 | 3 | 3 | 2 | 4 | drainage channels, standing water |
| 20.4 | 33.9 | MUDDYSAND | 3 | 3 | 4 | 1 | 4 | ripples, standing water |
| 20.5 | 8.3 | SAND | 2 | 2 | 4 | 1 | 4 | casts, ripples, standing water |
| 20.6 | 5.3 | SAND | 2 | 1 | 2 | 1 | 4 | casts, ripples, standing water |
| 20.7 | 7.0 | SAND | 2 | 1 | 3 | 1 | 4 | casts, ripples, standing water |
| 21.2 | 4.4 | SAND | 1 | 1 | 2 | 1 | 4 | casts, ripples, standing water |
| 21.4 | 8.2 | SAND | 1 | 1 | 2 | 1 | 4 | casts, tubes, ripples, standing water |
| 21.6 | 16.8 | SAND | 2 | 2 | 3 | 2 | 4 | casts, tubes, ripples, standing water |
| 21.8 | 19.5 | SAND | 1 | 2 | 2 | 2 | 4 | casts, ripples, standing water |

**Appendix 5. The frequency and mean density of invertebrates recorded from an area 0.25 $m^2$ in size that was dug adjacent to the site from which sample cores (sample area of 0.016 $m^2$) were taken. Seventy-five sites were dug in 1998 and 46 sites in 1999. The species size categories considered were those that were likely to occur at a density less than the 13 $m^{-2}$ that would be adequately sampled by the cores. The invertebrate's frequency and density in the core samples from sites in which the invertebrate was recorded in the dug sample are also shown for comparison.**

**1998 survey**

| Invertebrate | Frequency (no. sites) | | Mean density (no./$m^2$) | |
|---|---|---|---|---|
| | dug sample | core sample | dug sample | core sample |
| *Hediste diversiclor* >30 mm | 14 | 7 | 1.8 | 8.8 |
| *Lanice conchilega* >30 mm | 8 | 9 | 10.4 | 28.2 |
| *Littorina* sp | 1 | 2 | 4.0 | 17.7 |
| *Cerastoderma edule* 10-20 mm | 4 | 2 | 3.3 | 7.0 |
| *C. edule* 20-30 mm | 11 | 5 | 1.7 | 15.1 |
| *C. edule* >30 mm | 29 | 8 | 1.1 | 3.1 |
| *Scrobicularia plana* >30 mm | 4 | 1 | 0.6 | 3.0 |
| *Echinocardium* sp | 1 | 0 | 0.5 | 0 |

**1999 survey**

| Invertebrate | Frequency (no. sites) | | Mean density (no./$m^2$) | |
|---|---|---|---|---|
| | dug sample | core sample | dug sample | core sample |
| *Lanice conchilega* >30 mm | 3 | 0 | 0.14 | 0 |
| *Cerastoderma edule* 10-20 mm | 7 | 0 | 0.7 | 0 |
| *C. edule* 20-30 mm | 12 | 1 | 0.8 | 0.9 |
| *C. edule* >30 mm | 8 | 0 | 0.4 | 0 |

**Appendix 6 a-c. Between-survey comparisons of the mean densities (nos/$m^{-2}$) of invertebrates recorded in the 1986, 1998 and 1999 surveys within the river-related groups, west Wash, Welland and Nene and Ouse. a, The 1998 survey compared to the 1986 survey, b, the 1999 survey compared to the 1986 survey and c, the 1999 survey compared to the 1998 survey. The statistical significance of differences between pairs of surveys was determined by paired t-tests performed on $log_e$ transformed mean density using sampling transects as paired units. Levels of significance are indicated as follows, ns=not significant *=p<0.05, **=p<0.01, ***p<0.001 and ****=p<0.0001. Those invertebrates whose density differed significantly between surveys in any group are shown in bold text.**

**a. the 1998 survey compared to the 1986 survey**

| **Invertebrate family, species or species size category** | Years | West Wash n=3 | | | Welland&Nene n=7 | | | Ouse n=6 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| Phyllodocids | 1986 | 72 | 37 | ns | 185 | 61 | ns | 774 | 711 | ns |
| | 1998 | 50 | 6 | | 251 | 153 | | 417 | 225 | |
| ***Hediste diversicolor*** | 1986 | 1 | 1 | ns | 49 | 42 | ns | **167** | 74 | * |
| | 1998 | 0 | . | | 27 | 23 | | **78** | 105 | |
| other *Nephtys* species | 1986 | 26 | 12 | ns | 45 | 33 | ns | 8 | 9 | ns |
| | 1998 | 23 | 26 | | 33 | 42 | | 16 | 20 | |
| *Nephtys hombergii* | 1986 | 96 | 21 | ns | 122 | 41 | ns | 133 | 93 | ns |
| | 1998 | 50 | 30 | | 87 | 66 | | 89 | 67 | |
| *Scoloplos armiger* | 1986 | 73 | 24 | ns | 44 | 23 | ns | 25 | 53 | ns |
| | 1998 | 149 | 157 | | 118 | 138 | | 27 | 59 | |
| *Pygiospio* spp | 1986 | 114 | 63 | ns | 627 | 459 | ns | 1734 | 2093 | ns |
| | 1998 | 140 | 122 | | 541 | 422 | | 461 | 274 | |
| *Spio* spp | 1986 | 360 | 199 | ns | 93 | 67 | ns | 18 | 22 | ns |
| | 1998 | 289 | 263 | | 37 | 69 | | 29 | 28 | |
| **Cirratulids** | 1986 | 7 | 13 | ns | 488 | 891 | ns | **2** | 3 | * |
| | 1998 | 1 | 2 | | 289 | 395 | | **675** | 881 | |
| Capitellids | 1986 | 70 | 18 | ns | 53 | 67 | ns | 242 | 454 | ns |
| | 1998 | 18 | 25 | | 46 | 55 | | 65 | 85 | |
| ***Arenicola marina* casts** | 1986 | **16** | 5 | * | 4 | 3 | ns | 1 | 1 | ns |
| | 1998 | **6** | 3 | | 2 | 1 | | 1 | 1 | |
| *Clymenella torquata* | 1986 | 2 | 3 | ns | 2 | 3 | ns | 0 | . | |
| | 1998 | 0 | . | | 0 | . | | 0 | . | |
| *Lanice conchilega* | 1986 | 25 | 44 | ns | 23 | 49 | ns | 3 | 7 | ns |
| | 1998 | 11 | 12 | | 5 | 8 | | 0 | | |
| Oligochaetes | 1986 | 1 | 1 | ns | 2645 | 4268 | ns | 13724 | 18668 | ns |
| | 1998 | 3 | 6 | | 1173 | 2059 | | 1864 | 1387 | |
| *Urothoe* spp | 1986 | 385 | 74 | ns | 21 | 34 | ns | 2 | 3 | ns |
| | 1998 | 38 | 49 | | 11 | 22 | | 0 | . | |
| *Bathyporeia* spp | 1986 | 126 | 100 | ns | 11 | 20 | ns | 23 | 35 | ns |
| | 1998 | 36 | 30 | | 20 | 25 | | 20 | 46 | |
| ***Corophium arenarium* 3+mm** | 1986 | 41 | 62 | ns | **303** | 548 | * | **66** | 123 | * |
| | 1998 | 0 | . | | **4** | 6 | | **0** | . | |
| ***Corophium volutator* 3+ mm** | 1986 | 0 | . | ns | **326** | 451 | * | 1580 | 3441 | ns |
| | 1998 | 15 | 24 | | **0** | . | | 877 | 1014 | |
| **Crangon crangon** | 1986 | 22 | 8 | ns | **35** | 26 | ** | 26 | 17 | ns |
| | 1998 | 11 | 4 | | **9** | 6 | | 10 | 8 | |
| *Carcinus maenus* | 1986 | 3 | 1 | ns | 17 | 30 | ns | 4 | 4 | ns |
| | 1998 | 2 | 2 | | 4 | 3 | | 2 | 2 | |
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| ***Hydrobia ulva* 3+mm** | 1986 | **426** | 503 | * | 3659 | 2401 | ns | 5144 | 2994 | ns |

| **Invertebrate family, species or species size category** | Years | West Wash n=3 | | | Welland&Nene n=7 | | | Ouse n=6 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| | 1998 | **26** | 26 | | 7348 | 4434 | | 7574 | 4908 | |
| *Retusa obtusa* 3+ mm | 1986 | 10 | 16 | ns | 35 | 50 | ns | 41 | 56 | ns |
| | 1998 | 5 | 8 | | 98 | 194 | | 35 | 51 | |
| *Mytilus edulis* 5+ mm | 1986 | 0 | . | | 111 | 289 | ns | 159 | 390 | ns |
| | 1998 | 0 | . | | 11 | 28 | | 0 | . | |
| ***Cerastoderma edule*** | 1986 | **15** | 15 | * | 1253 | 1434 | ns | **1238** | 2266 | * |
| **4-10 mm** | 1998 | **201** | 192 | | 428 | 424 | | **106** | 201 | |
| ***Cerastoderma edule*** | 1986 | **65** | 55 | * | 53 | 30 | ns | 25 | 38 | ns |
| **16-40 mm** | 1998 | **6** | 2 | | 103 | 156 | | 4 | 6 | |
| *Cerastoderma edule* | 1986 | 41 | 35 | ns | 39 | 31 | ns | 14 | 22 | ns |
| 20-30 mm | 1998 | 3 | 2 | | 26 | 17 | | 0 | . | |
| ***Macoma balthica*** | 1986 | **307** | 200 | * | 1497 | 1154 | ns | **4444** | 4112 | ** |
| **<9 mm** | 1998 | **8** | 4 | | 153 | 161 | | **300** | 104 | |
| ***Macoma balthica*** | 1986 | **142** | 11 | * | **252** | 145 | * | 518 | 210 | ns |
| **6-15 mm** | 1998 | **14** | 10 | | **160** | 144 | | 235 | 110 | |
| ***Macoma balthica*** | 1986 | **83** | 31 | * | **128** | 101 | * | **286** | 108 | * |
| **9-20 mm** | 1998 | **7** | 9 | | **47** | 38 | | **69** | 52 | |
| **Mya arenaria** | 1986 | 0 | . | | 94 | 120 | ns | **213** | 151 | ** |
| | 1998 | 0 | . | | 4 | 11 | | **7** | 6 | |
| *Scrobicularia plana* | 1986 | 0 | . | | 5 | 2 | ns | 9 | 12 | ns |
| 20+ mm | 1998 | 0 | . | | 9 | 13 | | 8 | 10 | |

## Appendix.6 continued

## b. The 1999 survey compared to the 1986 survey.

| **Invertebrate family, species or species size category** | Years | West Wash n=3 | | | Welland&Nene n=4 | | | Ouse n=7 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| **Phyllodocids** | 1986 | 72 | 37 | ns | **245** | 55 | * | 683 | 692 | ns |
| | 1999 | 36 | 5 | | **140** | 21 | | 163 | 147 | |
| ***Hediste diversicolor*** | 1986 | 1 | 1 | ns | 49 | 35 | ns | **143** | 92 | * |
| | 1999 | 0 | . | | 64 | 51 | | **63** | 71 | |
| **other *Nephtys* species** | 1986 | **26** | 12 | * | 39 | 38 | ns | 16 | 22 | ns |
| | 1999 | **1** | 2 | | 9 | 13 | | 10 | 18 | |
| ***Nephtys hombergii*** | 1986 | 96 | 21 | ns | **162** | 28 | * | 128 | 86 | ns |
| | 1999 | 67 | 25 | | **79** | 22 | | 73 | 39 | |
| *Scoloplos armiger* | 1986 | 73 | 24 | ns | 41 | 26 | ns | 49 | 79 | ns |
| | 1999 | 81 | 7 | | 12 | 20 | | 59 | 91 | |
| *Pygiospio* spp | 1986 | 114 | 63 | ns | 736 | 418 | ns | 1491 | 2020 | ns |
| | 1999 | 102 | 113 | | 880 | 576 | | 1059 | 1080 | |
| *Spio* spp | 1986 | 360 | 199 | ns | 81 | 66 | ns | 19 | 21 | ns |
| | 1999 | 464 | 20 | | 148 | 170 | | 33 | 65 | |
| **Cirratulids** | 1986 | 7 | 13 | ns | 1057 | 1487 | ns | **2** | 3 | * |
| | 1999 | 0 | . | | 422 | 324 | | **626** | 1011 | |
| Capitellids | 1986 | 70 | 18 | ns | 91 | 92 | ns | 208 | 424 | ns |
| | 1999 | 49 | 47 | | 124 | 177 | | 1186 | 3061 | |
| *Arenicola marina* casts | 1986 | 16 | 5 | ns | 2 | 2 | ns | 1 | 1 | ns |
| | 1999 | 11 | 7 | | 1 | 1 | | 1 | 1 | |
| *Clymenella torquata* | 1986 | 2 | 3 | | 0 | . | | 0 | . | |
| | 1999 | 0 | . | | 0 | . | | 0 | . | |
| *Lanice conchilega* | 1986 | 25 | 44 | ns | 36 | 65 | ns | 21 | 47 | ns |
| | 1999 | 10 | 18 | | 14 | 10 | | 26 | 66 | |
| Oligochaetes | 1986 | 1 | 1 | ns | 4509 | 5011 | ns | 11764 | 17813 | ns |
| | 1999 | 1 | 2 | | 3109 | 2997 | | 2145 | 2574 | |
| *Urothoe* spp | 1986 | 385 | 74 | ns | 7 | 9 | ns | 4 | 6 | ns |
| | 1999 | 48 | 78 | | 3 | 3 | | 4 | 7 | |
| ***Bathyporeia* spp** | 1986 | 126 | 100 | ns | 4 | 7 | ns | **25** | 32 | * |
| | 1999 | 41 | 43 | | 1 | 2 | | **5** | 13 | |
| ***Corophium arenarium* 3+ mm** | 1986 | 41 | 62 | ns | 81 | 120 | ns | **61** | 113 | ** |
| | 1999 | 0 | . | | 0 | . | | **3** | 8 | |
| *Corophium volutator* 3+ mm | 1986 | 0 | . | ns | 148 | 220 | ns | 1354 | 3198 | ns |
| | 1999 | 221 | 307 | | 3 | 5 | | 1286 | 1787 | |
| ***Crangon crangon*** | 1986 | 22 | 8 | ns | **80** | 104 | ** | **27** | 17 | * |
| | 1999 | 32 | 22 | | **14** | 19 | | **11** | 11 | |
| ***Carcinus maenus*** | 1986 | **3** | 1 | * | 33 | 40 | ns | 5 | 5 | ns |
| | 1999 | **0** | . | | 3 | 2 | | 2 | 2 | |
| ***Hydrobia ulva* 3+ mm** | 1986 | 426 | 503 | ns | 2595 | 1205 | ns | **4461** | 3277 | * |
| | 1999 | 66 | 108 | | 2803 | 2005 | | **1562** | 1471 | |
| *Retusa obtusa* 3+ mm | 1986 | 10 | 16 | ns | 46 | 69 | ns | 35 | 54 | ns |
| | 1999 | 2 | 4 | | 2 | 2 | | 11 | 14 | |
| *Mytilus edulis* 5+ mm | 1986 | 0 | . | | 193 | 383 | ns | 154 | 356 | ns |
| | 1999 | 0 | . | | 0 | . | | 0 | . | |
| *Cerastoderma edule* 4-10 mm | 1986 | 16 | 15 | ns | 698 | 630 | ns | 1251 | 2069 | ns |
| | 1999 | 6 | 6 | | 1157 | 1292 | | 420 | 957 | |
| *Cerastoderma edule* 16-40 mm | 1986 | 65 | 55 | ns | 62 | 37 | ns | 25 | 34 | ns |
| | 1999 | 110 | 140 | | 178 | 142 | | 16 | 36 | |
| *Cerastoderma edule* 20-30 mm | 1986 | 41 | 35 | ns | 47 | 40 | ns | 14 | 20 | ns |
| | 1999 | 51 | 45 | | 60 | 66 | | 14 | 30 | |

| **Invertebrate family, species or species size category** | Years | West Wash n=3 | | | Welland&Nene n=4 | | | Ouse n=7 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| ***Macoma balthica*** | 1986 | **307** | 200 | **** | **1612** | 1327 | **** | **3812** | 4109 | * |
| **<9 mm** | 1999 | **15** | 10 | | **402** | 310 | | **678** | 616 | |
| ***Macoma balthica*** | 1986 | **142** | 11 | * | **268** | 192 | ** | 447 | 267 | ns |
| **6-15 mm** | 1999 | **11** | 8 | | **164** | 106 | | 317 | 242 | |
| ***Macoma balthica*** | 1986 | **83** | 31 | * | **141** | 137 | ** | **248** | 140 | * |
| **9-20 mm** | 1999 | **3** | 3 | | **71** | 61 | | **78** | 76 | |
| ***Mya arenaria*** | 1986 | 0 | . | | 113 | 157 | ns | **184** | 158 | **** |
| | 1999 | 0 | . | | 1 | 2 | | **1** | 2 | |
| *Scrobicularia plana* | 1986 | 0 | . | | 8 | 5 | ns | 8 | 11 | ns |
| 20+ mm | 1999 | 0 | . | | 18 | 11 | | 9 | 16 | |

## Appendix 6 continued

### c. The 1999 survey compared to the 1998 survey.

| **Invertebrate family, species or species size category** | Years | West Wash n=4 | | | Welland&Nene n=4 | | | Ouse n=10 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| **Phyllodocids** | 1998 | **39** | 22 | * | 213 | 158 | ns | **403** | 281 | * |
| | 1999 | **28** | 17 | | 103 | 55 | | **223** | 221 | |
| *Hediste diversicolor* | 1998 | 0 | . | | 19 | 20 | ns | 48 | 88 | ns |
| | 1999 | 0 | . | | 32 | 36 | | 63 | 74 | |
| **other *Nephtys* species** | 1998 | 50 | 58 | ns | 60 | 76 | ns | **41** | 57 | * |
| | 1999 | 29 | 56 | | 22 | 23 | | **19** | 39 | |
| *Nephtys hombergii* | 1998 | 38 | 35 | ns | 100 | 92 | ns | 105 | 96 | ns |
| | 1999 | 50 | 39 | | 79 | 22 | | 70 | 82 | |
| ***Scoloplos armiger*** | 1998 | 113 | 147 | ns | **56** | 67 | * | 26 | 45 | ns |
| | 1999 | 70 | 24 | | **22** | 22 | | 34 | 71 | |
| ***Pygiospio* spp** | 1998 | 108 | 119 | ns | 538 | 460 | ns | **306** | 296 | * |
| | 1999 | 80 | 102 | | 736 | 723 | | **1376** | 1047 | |
| ***Spio* spp** | 1998 | 235 | 240 | ns | **11** | 14 | * | 135 | 177 | ns |
| | 1999 | 399 | 131 | | **217** | 144 | | 130 | 294 | |
| Cirratulids | 1998 | 1 | 2 | ns | 321 | 342 | ns | 493 | 709 | ns |
| | 1999 | 0 | . | | 446 | 298 | | 750 | 942 | |
| Capitellids | 1998 | 14 | 21 | ns | 67 | 66 | ns | 40 | 71 | ns |
| | 1999 | 37 | 45 | | 36 | 23 | | 831 | 2564 | |
| ***Arenicola marina* casts** | 1998 | 5 | 4 | ns | **2** | 1 | * | 1 | 1 | ns |
| | 1999 | 8 | 8 | | **1** | 1 | | 1 | 1 | |
| *Clymenella torquata* | 1998 | 0 | . | | 0 | . | | 0 | . | |
| | 1999 | 0 | . | | 0 | . | | 0 | . | |
| *Lanice conchilega* | 1998 | 8 | 11 | ns | 12 | 17 | ns | 3 | 7 | ns |
| | 1999 | 9 | 14 | | 33 | 27 | | 1 | 2 | |
| Oligochaetes | 1998 | 3 | 5 | ns | 628 | 541 | ns | 1647 | 1849 | ns |
| | 1999 | 1 | 2 | | 1268 | 1209 | | 3643 | 6575 | |
| *Urothoe* spp | 1998 | 30 | 43 | ns | 4 | 9 | ns | 0 | . | ns |
| | 1999 | 38 | 67 | | 3 | 3 | | 1 | 3 | |
| *Bathyporeia* spp | 1998 | 34 | 25 | ns | 13 | 23 | ns | 24 | 43 | ns |
| | 1999 | 36 | 37 | | 1 | 2 | | 5 | 12 | |
| *Corophium arenarium* 3+ mm | 1998 | 0 | . | | 1 | 2 | ns | 1 | 4 | ns |
| | 1999 | 0 | . | | 0 | . | | 6 | 13 | |
| *Corophium volutator* 3+ mm | 1998 | 11 | 21 | ns | 1 | 2 | ns | 1007 | 1586 | ns |
| | 1999 | 166 | 274 | | 3 | 5 | | 2245 | 4214 | |
| *Crangon crangon* | 1998 | 9 | 5 | ns | 10 | 8 | ns | 10 | 8 | ns |
| | 1999 | 26 | 22 | | 3 | 3 | | 13 | 11 | |
| *Carcinus maenus* | 1998 | 2 | 2 | ns | 3 | 2 | ns | 2 | 3 | ns |
| | 1999 | 0 | . | | 3 | 2 | | 1 | 1 | |
| ***Hydrobia ulva* 3+ mm** | 1998 | 24 | 22 | ns | 9671 | 4629 | ns | **5255** | 4925 | **** |
| | 1999 | 49 | 94 | | 2726 | 2135 | | **1128** | 1392 | |
| *Retusa obtusa* 3+ mm | 1998 | 7 | 2 | ns | 34 | 41 | ns | 23 | 41 | ns |
| | 1999 | 2 | 3 | | 2 | 2 | | 8 | 12 | |
| *Mytilus edulis* 5+ mm | 1998 | 0 | . | | 19 | 37 | ns | 0 | . | |
| | 1999 | 0 | . | | 0 | . | | 0 | . | |
| *Cerastoderma edule* 4-10 mm | 1998 | 151 | 186 | ns | 1874 | 2507 | ns | 78 | 159 | ns |
| | 1999 | 5 | 6 | | 1156 | 1293 | | 296 | 807 | |
| ***Cerastoderma edule* 16-40 mm** | 1998 | 6 | 1 | ns | **45** | 31 | ** | 3 | 5 | ns |
| | 1999 | 83 | 127 | | **193** | 118 | | 15 | 32 | |
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |

| **Invertebrate family, species or species size category** | Years | West Wash n=4 | | | Welland&Nene n=4 | | | Ouse n=10 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | mean | SD | signif. level | mean | SD | signif. level | mean | SD | signif. level |
| *Cerastoderma edule* 20-30 mm | 1998 | 2 | 2 | ns | 25 | 14 | ns | 0 | . | ns |
| | 1999 | 38 | 45 | | 77 | 52 | | 12 | 26 | |
| ***Macoma balthica* <9 mm** | 1998 | 6 | 5 | ns | 119 | 75 | ns | **239** | 145 | ** |
| | 1999 | 13 | 10 | | 343 | 369 | | **720** | 668 | |
| *Macoma balthica* 6-15 mm | 1998 | 11 | 11 | ns | 123 | 102 | ns | 182 | 125 | ns |
| | 1999 | 8 | 8 | | 146 | 131 | | 257 | 223 | |
| *Macoma balthica* 9-20 mm | 1998 | 5 | 8 | ns | 43 | 50 | ns | 52 | 47 | ns |
| | 1999 | 2 | 3 | | 66 | 67 | | 61 | 68 | |
| *Mya arenaria* | 1998 | 0 | . | | 7 | 14 | ns | 15 | 31 | ns |
| | 1999 | 0 | . | | 1 | 2 | | 1 | 2 | |
| *Scrobicularia plana* 20+ mm | 1998 | 0 | . | | 5 | 4 | ns | 5 | 8 | ns |
| | 1999 | 0 | . | | 14 | 14 | | 6 | 14 | |

**Appendix 7. The regression parameters relating the change in invertebrate density ($log_e$ mean density) between surveys to the change in particle size (%<63 μm) and organic content (%Loss On Ignition) of the sediment. Parameters are tabulated only in those instances where the sediment variables explained a significant amount (p<0.05) of the variation in changes in invertebrate density.**

**Worms**

| **Invertebrate** family, species or species size category | survey comparison | regression parameters | | | |
|---|---|---|---|---|---|
| | | intercept | coefficients for difference in %<63 μm | coefficients for difference in %LOI | R square as % |
| **Phyllodocids** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **-1.2** | **0.4** | **.** | **11** |
| ***Hediste diversicolor*** | **'98 to '86** | **-0.7** | **.** | **0.3** | **18** |
| | **'99 to '86** | **-0.4** | **0.05** | **.** | **19** |
| | **'99 to '98** | **0.1** | **0.3** | **.** | **8** |
| *Nephtys hombergii* | **'98 to '86** | **-0.9** | **.** | **-0.2** | **5** |
| | **'99 to '86** | **-0.7** | **.** | **-0.4** | **20** |
| | '99 to '98 | . | . | . | . |
| **other *Nephtys* species** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| *Scoloplos armiger* | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| *Pygospio* spp | '98 to '86 | . | . | . | . |
| | **'99 to '86** | **0.4** | **0.1** | **-0.5** | **11** |
| | **'99 to '98** | **-0.01** | **.** | **0.6** | **6** |
| *Spio* spp | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| **Cirratulids** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **1.1** | **0.1** | **-0.6** | **14** |
| Capitellids | '98 to '86 | . | . | . | . |
| | **'99 to '86** | **-0.5** | **.** | **0.4** | **9** |
| | '99 to '98 | . | . | . | . |
| ***Arenicola marina* casts** | **'98 to '86** | **-0.5** | **.** | **-0.2** | **16** |
| | **'99 to '86** | **-0.5** | **-0.02** | **.** | **23** |
| | '99 to '98 | . | . | . | . |
| *Clymenella torquata* | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| *Lanice conchilega* | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| Oligochaetes | **'98 to '86** | **-0.7** | **.** | **0.5** | **18** |
| | **'99 to '86** | **-0.5** | **.** | **0.5** | **24** |
| | **'99 to '98** | **0.2** | **.** | **0.3** | **5** |

## Appendix 7. contd

## Crustaceans

| **Invertebrate** family, species or species size category | survey comparison | regression parameters | | | |
|---|---|---|---|---|---|
| | | intercept | coefficients for difference in %<63 μm | %LOI | R square as % |
| ***Urothoe* spp** | **'98 to '86** | **-1.2** | **.** | **-0.2** | **5** |
| | **'99 to '86** | **-0.9** | **-0.2** | **.** | **5** |
| | '99 to '98 | . | . | . | . |
| ***Bathyporeia* spp** | '98 to '86 | . | . | . | . |
| | **'99 to '86** | **-1** | **0-.1** | **0.3** | **11** |
| | '99 to '98 | . | . | . | . |
| ***Corophium arenarium* 3+ mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| *Corophium volutator* 3+ mm | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| ***Crangon crangon*** | **'98 to '86** | **-1.1** | **.** | **-0.3** | **10** |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| ***Carcinus maenus*** | '98 to '86 | . | . | . | . |
| | **'99 to '86** | **-0.4** | **0.1** | **-0.4** | **14** |
| | '99 to '98 | . | . | . | . |

## Appendix 7 contd

## Molluscs

| **Invertebrate** family, species or species size category | survey comparison | regression parameters | | | |
|---|---|---|---|---|---|
| | | intercept | coefficients for difference in %<63 μm | coefficients for difference in %LOI | R square as % |
| ***Hydrobia ulvae* 3+ mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **-1.7** | **0.1** | **.** | **9** |
| ***Retusa obtusa* 3+ mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **-0.4** | **.** | **-0.3** | **5** |
| *Mytilus edulis* 5+ mm | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| ***Cerastoderma edule* 4-10 mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **-1.1** | **1.0** | **.** | **23** |
| ***Cerastoderma edule* 16-40 mm** | **'98 to '86** | **-1.7** | **0.1** | **-0.7** | **9** |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| ***Cerastoderma edule* 20-30 mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| ***Macoma balthica* <9 mm** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | **'99 to '98** | **0.1** | **.** | **0.7** | **21** |
| ***Macoma balthica* 6-15 mm** | **'98 to '86** | **-1.7** | **0.1** | **-0.8** | **19** |
| | **'99 to '86** | **-1.0** | **-0.03** | **.** | **11** |
| | **'99 to '98** | **-0.1** | **.** | **0.4** | **11** |
| ***Macoma balthica* 9-20 mm** | **'98 to '86** | **-1.9** | **.** | **-0.3** | **10** |
| | **'99 to '86** | **-1.4** | **-0.04** | **.** | **12** |
| | '99 to '98 | . | . | . | . |
| ***Mya arenaria*** | '98 to '86 | . | . | . | . |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |
| *Scrobicularia plana* 20+ mm | **'98 to '86** | **-0.1** | **0.02** | **.** | **7** |
| | '99 to '86 | . | . | . | . |
| | '99 to '98 | . | . | . | . |

## Appendix 8. Photographs of Wash sampling sites surveyed in 1998

| slide no. | sample site | easting | northing | sampling date | Notes |
|---|---|---|---|---|---|
| 98/1 | 2.2 | 551582 | 353302 | 04/10/98 | |
| 98/2 | 2.4 | 552284 | 352651 | 04/10/98 | |
| 98/3 | 2.6 | 552997 | 352019 | 04/10/98 | |
| 98/4 | 2.7 | 553347 | 351672 | 04/10/98 | |
| 98/5 | 2.8 | 553845 | 351407 | 04/10/98 | |
| 98/6 | 4.2 | 548188 | 350255 | 05/10/98 | |
| 98/7 | 4.4 | 548778 | 349736 | 05/10/98 | |
| 98/8 | 4.6 | 549304 | 349249 | 05/10/98 | |
| 98/9 | 4.7 | 549572 | 349016 | 05/10/98 | |
| 98/10 | 4.8 | 549844 | 348765 | 05/10/98 | |
| 98/11 | 4.9 | 550146 | 348499 | 05/10/98 | |
| 98/12 | LS1 | 552399 | 346338 | 22/09/98 | |
| 98/13 | LS2 | 552176 | 346495 | 22/09/98 | |
| 98/14 | LS3 | 552018 | 346602 | 22/09/98 | |
| 98/15 | LS4 | 553209 | 346920 | 22/09/98 | |
| 98/16 | LS5 | 553090 | 347261 | 22/09/98 | |
| 98/17 | LS6 | 553009 | 347473 | 22/09/98 | |
| 98/18 | 5.2 | 545814 | 348459 | 18/09/98 | |
| 98/19 | 5.4 | 546200 | 348113 | 18/09/98 | |
| 98/20 | 5.6 | 546569 | 347766 | 18/09/98 | |
| 98/21 | 5.7 | 546758 | 347602 | 18/09/98 | |
| 98/22 | 5.8 | 546955 | 347420 | 18/09/98 | |
| 98/23 | 5.9 | 547204 | 347221 | 18/09/98 | |
| 98/24 | 7.2 | 542130 | 343918 | 03/11/98 | |
| 98/25 | 7.4 | 542521 | 343580 | 03/11/98 | |
| 98/26 | 7.6 | 542905 | 343236 | 03/11/98 | |
| 98/27 | 7.7 | 543085 | 343069 | 03/11/98 | |
| 98/28 | 7.8 | 543287 | 342890 | 03/11/98 | |
| 98/29 | 7.9 | 543478 | 342718 | 03/11/98 | |
| 98/30 | 8.2 | 541115 | 342381 | 06/10/98 | |
| 98/31 | 8.4 | 541324 | 342181 | 06/10/98 | |
| 98/32 | 8.7 | 541674 | 341870 | 06/10/98 | |
| 98/33 | 8.8 | 541802 | 341763 | 06/10/98 | |
| 98/34 | 8.9 | 541942 | 341673 | 06/10/98 | |
| 98/35 | 10.2 | 539441 | 336536 | 02/11/98 | |
| 98/36 | 10.4 | 540093 | 337398 | 02/11/98 | |
| 98/37 | 10.6 | 540733 | 338243 | 21/09/98 | |
| 98/38 | 10.7 | 541032 | 338640 | 21/09/98 | |
| 98/39 | 10.8 | 541362 | 339058 | 21/09/98 | |
| 98/40 | 10.9 | 541672 | 339455 | 21/09/98 | |
| 98/41 | RT1 | 545016 | 339967 | 23/09/98 | |
| 98/42 | RT2 | 544755 | 340162 | 23/09/98 | |
| 98/43 | RT3 | 544512 | 340399 | 23/09/98 | |
| 98/44 | RT4 | 545759 | 341150 | 23/09/98 | No photo |
| 98/45 | RT5 | 545506 | 341321 | 23/09/98 | |
| 98/46 | RT6 | 545284 | 341513 | 23/09/98 | |
| 98/47 | 11.2 | 543328 | 334989 | 19/09/98 | |
| 98/48 | 11.4 | 543686 | 336025 | 19/09/98 | |
| 98/49 | 11.6 | 543993 | 336890 | 19/09/98 | |
| 98/50 | 11.7 | 544120 | 337258 | 19/09/98 | |
| 98/51 | 11.8 | 544266 | 337682 | 19/09/98 | |
| 98/52 | 11.9 | 544409 | 338070 | 19/09/98 | |
| 98/53 | GS1 | 547087 | 339216 | 24/09/98 | |
| 98/54 | GS2 | 547136 | 338936 | 24/09/98 | |
| 98/55 | GS3 | 547212 | 338582 | 24/09/98 | |
| 98/56 | GS4 | 546533 | 338533 | 24/09/98 | |
| 98/57 | GS5 | 546489 | 338825 | 24/09/98 | |

| slide no. | sample site | easting | northing | sampling date | Notes |
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| 98/58 | 12.2 | 545707 | 333865 | 03/10/98 | |
| 98/59 | 12.4 | 546143 | 334656 | 03/10/98 | |
| 98/60 | 12.6 | 546591 | 335496 | 03/10/98 | |
| 98/61 | 12.7 | 546815 | 335906 | 03/10/98 | |
| 98/62 | 12.8 | 547027 | 336307 | 03/10/98 | |
| 98/63 | 12.9 | 547250 | 336731 | 03/10/98 | |
| 98/64 | 14.1 | 547939 | 330536 | 09/10/98 | |
| 98/65 | 14.2 | 548253 | 330820 | 09/10/98 | |
| 98/66 | 14.4 | 548714 | 331255 | 09/10/98 | |
| 98/67 | 14.5 | 548943 | 331449 | 09/10/98 | |
| 98/68 | 14.6 | 549184 | 331677 | 09/10/98 | |
| 98/69 | 15.2 | 551349 | 327763 | 06/11/98 | |
| 98/70 | 15.4 | 551447 | 328713 | 06/11/98 | |
| 98/71 | 15.6 | 551544 | 329560 | 06/11/98 | |
| 98/72 | 15.7 | 551593 | 330055 | 06/11/98 | |
| 98/73 | 15.8 | 551644 | 330541 | 06/11/98 | |
| 98/74 | 16.2 | 554630 | 327254 | 20/10/98 | |
| 98/75 | 16.3 | 554647 | 327518 | 20/10/98 | |
| 98/76 | 16.4 | 554655 | 327782 | 20/10/98 | |
| 98/77 | 16.6 | 554682 | 328299 | 20/10/98 | |
| 98/78 | 16.7 | 554698 | 328517 | 20/10/98 | |
| 98/79 | 16.8 | 554715 | 328768 | 20/10/98 | |
| 98/80 | 16.9 | 554722 | 328949 | 20/10/98 | |
| 98/81 | 17.2 | 557194 | 326969 | 22/10/98 | |
| 98/82 | 17.3 | 557279 | 327181 | 22/10/98 | |
| 98/83 | 17.4 | 557354 | 327364 | 22/10/98 | |
| 98/84 | 17.6 | 557501 | 327737 | 22/10/98 | |
| 98/85 | 17.7 | 557582 | 327924 | 22/10/98 | |
| 98/86 | 17.8 | 557649 | 328099 | 22/10/98 | |
| 98/87 | 17.9 | 557741 | 328309 | 22/10/98 | |
| 98/88 | d.2 | 557639 | 329536 | 19/10/98 | |
| 98/89 | d.3 | 557427 | 330087 | 19/10/98 | |
| 98/90 | d.4 | 557221 | 330620 | 19/10/98 | |
| 98/91 | p.1 | 558509 | 329675 | 19/10/98 | |
| 98/92 | p.2 | 558529 | 330268 | 19/10/98 | |
| 98/93 | p.3 | 558591 | 330779 | 19/10/98 | |
| 98/94 | b.2 | 558436 | 325950 | 08/10/98 | |
| 98/95 | b.3 | 558543 | 326079 | 08/10/98 | |
| 98/96 | c.2 | 559156 | 326812 | 17/09/98 | |
| 98/97 | c.3 | 559082 | 326779 | 17/09/98 | |
| 98/98 | 18.3 | 560050 | 327461 | 07/10/98 | |
| 98/99 | 18.4 | 559811 | 327581 | 07/10/98 | |
| 98/100 | 18.6 | 559476 | 327732 | 07/10/98 | |
| 98/101 | 18.7 | 559305 | 327823 | 07/10/98 | |
| 98/102 | 18.8 | 559187 | 327882 | 07/10/98 | |
| 98/103 | 18.9 | 559050 | 328046 | 07/10/98 | |
| 98/104 | e.8 | 559525 | 328614 | 17/09/98 | |
| 98/105 | e.9 | 559392 | 328907 | 17/09/98 | |
| 98/106 | 19.2 | 561740 | 329041 | 05/11/98 | |
| 98/107 | 19.3 | 561530 | 329206 | 05/11/98 | |
| 98/108 | 19.4 | 561330 | 329390 | 05/11/98 | |
| 98/109 | 19.6 | 560833 | 329670 | 05/11/98 | |
| 98/110 | 19.7 | 560629 | 329854 | 05/11/98 | |
| 98/111 | 19.8 | 560482 | 329974 | 05/11/98 | |
| 98/112 | 19.9 | 560266 | 330150 | 05/11/98 | |
| 98/113 | 20.2 | 563950 | 330740 | 21/10/98 | |
| 98/114 | 20.3 | 563450 | 331050 | 21/10/98 | |
| 98/115 | 20.4 | 563090 | 331350 | 21/10/98 | |
| 98/116 | 20.5 | 562650 | 331750 | 21/10/98 | |

| slide no. | sample site | easting | northing | sampling date | Notes |
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| 98/117 | 20.6 | 562250 | 332050 | 21/10/98 | |
| 98/118 | 20.7 | 561850 | 332400 | 21/10/98 | |
| 99/1 | 2.2 | 551582 | 353302 | 10/10/99 | |
| 99/2 | 2.3 | 551938 | 352983 | 10/10/99 | |
| 99/3 | 2.4 | 552284 | 352651 | 10/10/99 | |
| 99/4 | 2.6 | 552997 | 352019 | 10/10/99 | |
| 99/5 | 2.7 | 553347 | 351672 | 10/10/99 | |
| 99/6 | 2.8 | 553845 | 351407 | 10/10/99 | |
| 99/7 | LS1 | 552399 | 346338 | 08/10/99 | |
| 99/8 | LS2 | 552176 | 346495 | 08/10/99 | |
| 99/9 | LS3 | 552018 | 346602 | 08/10/99 | |
| 99/10 | LS4 | 553209 | 346920 | 08/10/99 | |
| 99/11 | LS5 | 553090 | 347261 | 08/10/99 | |
| 99/12 | LS6 | 553009 | 347473 | 08/10/99 | |
| 99/13 | 4.2 | 548188 | 350255 | 06/10/99 | |
| 99/14 | 4.3 | 548463 | 350011 | 06/10/99 | |
| 99/15 | 4.4 | 548778 | 349736 | 06/10/99 | |
| 99/16 | 4.6 | 549304 | 349249 | 06/10/99 | |
| 99/17 | 4.7 | 549572 | 349016 | 06/10/99 | |
| 99/18 | 4.8 | 549844 | 348765 | 06/10/99 | |
| 99/19 | 4.9 | 550146 | 348499 | 06/10/99 | |
| 99/20 | 5.1 | 545600 | 348632 | 28/10/99 | |
| 99/21 | 5.2 | 545814 | 348459 | 28/10/99 | |
| 99/22 | 5.4 | 546200 | 348113 | 28/10/99 | |
| 99/23 | 5.6 | 546569 | 347766 | 28/10/99 | |
| 99/24 | 5.7 | 546758 | 347602 | 28/10/99 | |
| 99/25 | 5.8 | 546955 | 347420 | 28/10/99 | |
| 99/26 | 5.9 | 547204 | 347221 | 28/10/99 | |
| 99/27 | 8.2 | 541115 | 342381 | 24/09/99 | |
| 99/28 | 8.4 | 541324 | 342181 | 24/09/99 | |
| 99/29 | 8.6 | 541565 | 341968 | 24/09/99 | |
| 99/30 | 8.7 | 541674 | 341870 | 24/09/99 | |
| 99/31 | 8.8 | 541802 | 341763 | 24/09/99 | |
| 99/32 | 8.9 | 541942 | 341673 | 24/09/99 | |
| 99/33 | 9.2 | 539905 | 340414 | 23/09/99 | |
| 99/34 | 9.4 | 540046 | 340296 | 23/09/99 | |
| 99/35 | 9.6 | 540187 | 340165 | 23/09/99 | |
| 99/36 | 9.8 | 540334 | 340046 | 23/09/99 | |
| 99/37 | 11.2 | 543328 | 334989 | 07/11/99 | |
| 99/38 | 11.3 | 543503 | 335500 | 07/11/99 | |
| 99/39 | 11.4 | 543686 | 336025 | 07/11/99 | |
| 99/40 | 11.6 | 543993 | 336890 | 07/11/99 | |
| 99/41 | 11.7 | 544120 | 337258 | 07/11/99 | |
| 99/42 | 11.8 | 544266 | 337682 | 07/11/99 | |
| 99/43 | 11.9 | 544409 | 338070 | 07/11/99 | |
| 99/44 | GS1 | 547087 | 339216 | 07/10/99 | |
| 99/45 | GS2 | 547136 | 338936 | 07/10/99 | |
| 99/46 | GS3 | 547212 | 338582 | 07/10/99 | |
| 99/47 | GS4 | 546533 | 338533 | 07/10/99 | |
| 99/48 | GS5 | 546489 | 338825 | 07/10/99 | |
| 99/49 | 15.2 | 551349 | 327763 | 08/11/99 | |
| 99/50 | 15.3 | 551400 | 328232 | 08/11/99 | |
| 99/51 | 15.4 | 551447 | 328713 | 08/11/99 | |
| 99/52 | 15.6 | 551544 | 329560 | 08/11/99 | |
| 99/54 | 15.8 | 551644 | 330541 | 08/11/99 | |
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| 99/56 | 16.3 | 554647 | 327518 | 13/10/99 | |
| 99/57 | 16.4 | 554655 | 327782 | 13/10/99 | |
| 99/58 | 16.6 | 554682 | 328299 | 13/10/99 | |

| slide no. | sample site | easting | northing | sampling date | Notes |
|---|---|---|---|---|---|
| 99/59 | 16.7 | 554698 | 328517 | 13/10/99 | |
| 99/60 | 16.8 | 554715 | 328768 | 13/10/99 | |
| 99/61 | 16.9 | 554722 | 328949 | 13/10/99 | |
| 99/62 | 17.2 | 557194 | 326969 | 27/10/99 | |
| 99/63 | 17.3 | 557279 | 327181 | 27/10/99 | |
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| 99/65 | 17.6 | 557501 | 327737 | 27/10/99 | |
| 99/66 | 17.7 | 557582 | 327924 | 27/10/99 | |
| 99/67 | 17.8 | 557649 | 328099 | 27/10/99 | |
| 99/68 | 17.9 | 557741 | 328309 | 27/10/99 | |
| 99/69 | D.2 | 557639 | 329536 | 25/10/99 | No photo |
| 99/70 | D.3 | 557427 | 330087 | 25/10/99 | No photo |
| 99/71 | D.4 | 557221 | 330620 | 25/10/99 | No photo |
| 99/72 | P.1 | 558509 | 329675 | 25/10/99 | No photo |
| 99/73 | P.2 | 558529 | 330268 | 25/10/99 | No photo |
| 99/74 | P.3 | 558591 | 330779 | 25/10/99 | No photo |
| 99/75 | B.2 | 558436 | 325950 | 21/09/99 | |
| 99/76 | B.3 | 558543 | 326079 | 21/09/99 | |
| 99/77 | C.2 | 559156 | 326812 | 22/09/99 | |
| 99/78 | C.3 | 559082 | 326779 | 22/09/99 | |
| 99/79 | 18.3 | 560050 | 327461 | 22/10/99 | |
| 99/80 | 18.4 | 559811 | 327581 | 22/10/99 | |
| 99/81 | 18.6 | 559476 | 327732 | 22/10/99 | |
| 99/82 | 18.7 | 559305 | 327823 | 22/10/99 | |
| 99/83 | 18.8 | 559187 | 327882 | 22/10/99 | No photo |
| 99/84 | 18.9 | 559050 | 328046 | 22/10/99 | No photo |
| 99/85 | E.8 | 559525 | 328614 | 22/09/99 | |
| 99/86 | E.9 | 559392 | 328907 | 22/09/99 | |
| 99/87 | 19.2 | 561761 | 328939 | 12/10/99 | |
| 99/88 | 19.3 | 561530 | 329206 | 12/10/99 | |
| 99/89 | 19.4 | 561330 | 329390 | 12/10/99 | |
| 99/90 | 19.6 | 560833 | 329670 | 12/10/99 | |
| 99/91 | 19.7 | 560629 | 329854 | 12/10/99 | |
| 99/92 | 19.8 | 560482 | 329974 | 12/10/99 | |
| 99/93 | 19.9 | 560266 | 330150 | 12/10/99 | |
| 99/94 | 20.2 | 563950 | 330740 | 26/10/99 | |
| 99/95 | 20.3 | 563450 | 331050 | 26/10/99 | |
| 99/96 | 20.4 | 563090 | 331350 | 26/10/99 | |
| 99/97 | 20.5 | 562650 | 331750 | 26/10/99 | |
| 99/98 | 20.6 | 562250 | 332050 | 26/10/99 | |
| 99/99 | 20.7 | 561850 | 332400 | 26/10/99 | |
| 99/100 | 21.2 | 565700 | 336255 | 27/09/99 | |
| 99/101 | 21.4 | 565400 | 336355 | 27/09/99 | |
| 99/102 | 21.6 | 565150 | 336495 | 27/09/99 | |
| 99/103 | 21.8 | 564850 | 336600 | 27/09/99 | |

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Front cover photographs:
Top left: Using a home-made moth trap.
Peter Wakely / English Nature 17,396
Middle left: English Nature bat warden with a whiskered bat near Holme, Devon.
Paul Glendell / English Nature 24,795
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell / English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
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