

LOIS 'Shelf-Edge Study' Seabed Photographs

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*Original photographs were taken by John Humphery, and
Jane Foster and Martyn Harvey of DML.*

Introduction

A **bed-hopping camera** is used to obtain the seabed photographs. A 35-mm film-camera, fitted with a 35-mm semi-wideangle lens and spherical front-port, is mounted near the top of a protective frame. It looks downwards and forwards. An underwater flashgun is mounted below the camera, and is aligned to illuminate the centre of the camera's field of view: the low, oblique lighting maximises shadow-detail of any bed-relief. A bottom-switch is actuated when the weight hanging from it touches the seabed; this fires the camera and flash, which wind-on and reset automatically. A downwards-looking pinger pings at 1-second intervals: the mutual approach of the direct ray and seabed echoes on the mother-ship's echo-sounder indicate when the camera-frame is nearing the seabed. When the bottom-contact weight touches the seabed, the bottom-switch doubles the ping-rate, indicating to the operator that a picture has been taken. A magnetic compass is mounted in the bottom right-hand corner of the camera's field of view to show the orientation of bedforms, etc.

The whole apparatus is lowered on the hydrographic wire from the mother ship; height above the bed is monitored by the operator on the echo sounder - progress is very slow over the last five metres. The operator listens for the ping-rate to change, indicating that bed-contact has occurred and that a picture has been taken, and the hydrographic wire is hauled up a few metres. About a minute is allowed for the camera to wind-on and reset, and for the ship to drift a few metres to a new photographic site, and the wire is lowered again for the next photograph. Up to 28 frames can be taken on a standard 36-shot cassette. Fine-grain black-and-white film is used to maximise detail and to allow processing to be carried out on the ship.

Over 700 seabed-shots were taken on 32 site visits during the SES cruise programme. The sites are shown on a **bathymetric map**. The **selection of seabed pictures** which are presented here illustrates the nature of the seabed at each site, the presence or otherwise of bedforms and biota, and perhaps, in some cases, the changing nature of the bed-surface with the seasons.

An **areal calibration-grid**, $(x,y) = (10, 50)$ cm, has been prepared which can be used to size objects in the photographs, or to derive population-density information. A **table** of Wentworth size classes describes the grain-size terms used in the text. The picture-area is trapezoidal in shape: it is about 2 m front to back, about 1.3 m wide at the bottom and about 2.5 m wide across the top. (Note, however, that the picture-area can be distorted if the camera frame is not hanging vertically from the hydrographic wire.)

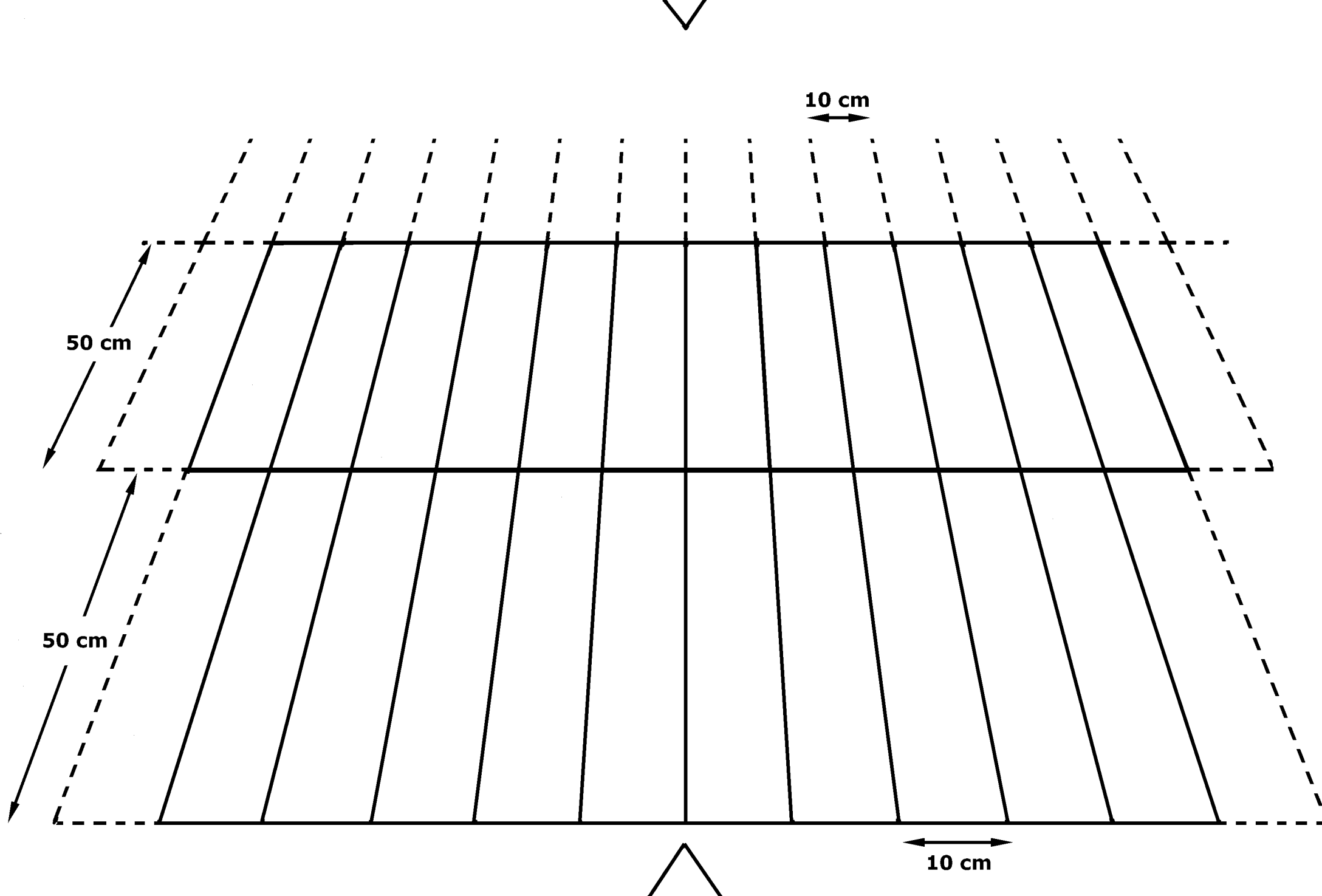
To navigate through the electronic photographs, either choose a site from the bookmarks to the left, click on a site on the **bathymetric map**, or click on a site or photograph identifier in the **index** of photographs. Links within this document are highlighted in red. Part frame enlargements are suffixed with (e).

Wentworth Grain-Size Classes

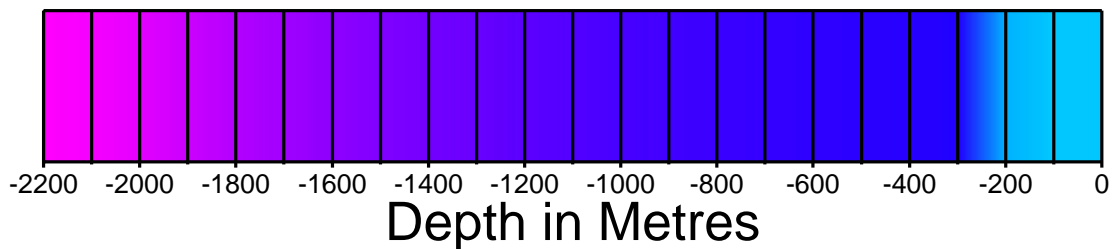
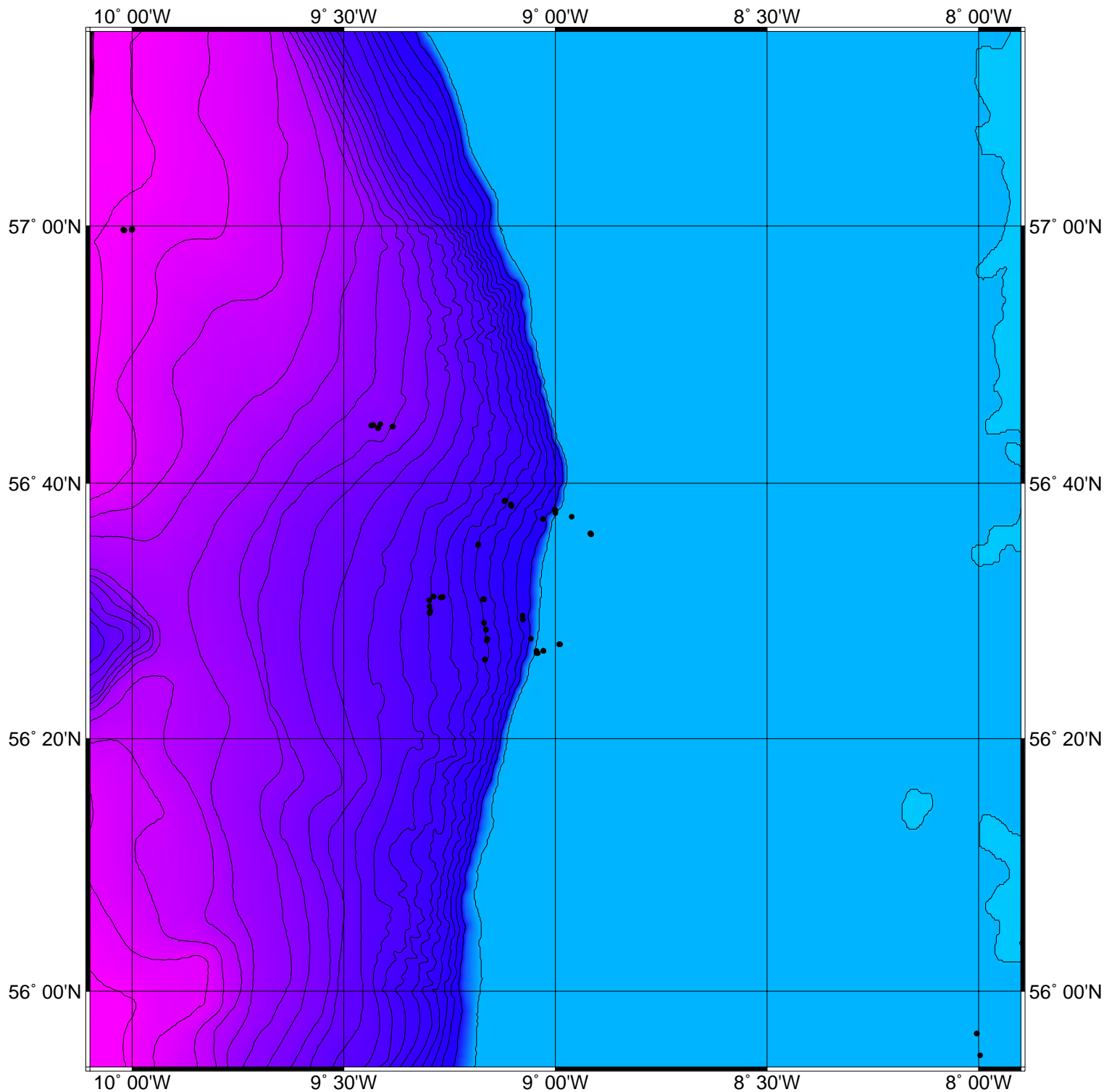
Wentworth grain-size terms are referred to in the text. The table below gives the grain-size classes for each term.
The US Bureau of Soils classification is given for comparison.

<i>Wentworth(1922) after Udden (1898)</i>		Particle Diameter		<i>US Bureau of Soils</i>	
		Phi*	mm	microns	
G R A V E L	BOULDER	-8	256	100	<div>* A Phi unit is the negative logarithm to the base two of the particle diameter.</div>
	COBBLE	-7	128		
	PEBBLE	-6	64		
		-5	32		
		-4	16		
S A N D	GRANULE	-3	8	10	<div>LARGE</div> <div>MEDIUM</div> <div>FINE</div> <div>COARSE</div> <div>MEDIUM</div> <div>FINE</div> <div>VERY FINE</div>
	VERY COARSE	-2	4		
	COARSE	-1	2		
	MEDIUM	0	1		
	FINE	+1	1/2		
M U D	VERY FINE	+2	1/4	<div>1000</div> <div>500</div> <div>250</div> <div>125</div> <div>31.3</div> <div>15.6</div> <div>7.8</div> <div>3.9</div> <div>1.95</div> <div>0.98</div> <div>0.49</div> <div>0.24</div>	<div>S A N D</div> <div>S I L T</div> <div>C L A Y</div>
	COARSE	+3	1/8		
	MEDIUM	+4	1/16		
	FINE	+5	1/32		
	VERY FINE	+6	1/64		
	COARSE	+7	1/128		
	MEDIUM	+8	1/256		
	FINE	+9	1/512		
	VERY FINE	+10	1/1024		
	COLLOID	+11	1/2048		
		+12	1/4096		





Bathymetry of the LOIS SES Area



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