"Made available under NASA sponsorship
in the interest of early and wide dissemination of Earth Resources Survey
Program information and without liability
for any use made thereof."

28990 Investigation of Environmental

Change Pattern in Japan

(Classification of Shorelines)

Dr. Daitaro SHOJI

Co-Investigator

Chief Hydrographer
Hydrographic Department
Maritime Safety Agency

Tsukiji 5-3-1, Chuo-ku
Tokyo, Japan

(E77-10084) INVESTIGATION OF ENVIRONMENTAL CHANGE PATTERN IN JAPAN. CLASSIFICATION OF SHORELINES Quarterly Report (Science Univ. of Tokyo (Japan).) 11 p HC A02/MF A01 CSCI 08E G3/43

N77-17537

Unclas
00084

Quarterly Report

January 1977

Classification of Shorelines

Dr. Daitaro SHOJI
Chief Hydrographer

Hydrographic Department, Maritime Safety Agency
Tsukiji 5-3-1, Chuo-ku, Tokyo, Japan

1. Introduction

In succession to the report of Aug 1, 1976, correspondence of the each shorelines sensed by the four MSS bands are reexamined and also tested by the topographic map and field survey. Each shoreline depicted from the four MSS bands shows good correspondence except for one area where the shorelines of band 4 and 5 are indistinct.

2. Techniques

Same as the previous report.

3. Accomplishments

(1) Fig. 1 through Fig. 4 which correspond to band 4 through band 7, respctively, are depicted in such a way that areas classified as the land are marked with + and areas classified as the sea with - . The threshold criteria of symbol + and - are given in Table 1. Fig. 5 shows composition of the shorelines obtained in Fig. 1 through Fig. 4 giving shifts of the each ordinate to avoid overlaps of the shorelines. Symbol ■ in the Fig. 5 means that on that part (unharmonic part) the shorelines do not accord with

the others.

(2) Typical landscape of the shoreline and its behind is shown in Fig. 6 (photograph), and the topographic vertical section at right angles to the shoreline are illustrated as Fig. 7. Moreover, predicted values of tide for the MSS scene and the photograph are given in Table 2.

(3) From the Table 2 the tide at which the MSS scenery was taken seems to be at flood and the shoreline of MSS scenery was near high-tide limit. Therefore, the optical property of sand and sea water should have been distinctive. As is shown in Fig. 5, the correspondence of the each shoreline is very good.

(4) Topographical map of the uncertain area indicated in Fig. 5 is shown in Fig. 8. The narrow sand beach (30m in width) and cliff just behind it continued to pine grove cause uncertainty in the MSS images.

4. Significant results

The sand beach can be separated from the sea-water in each four bands if only a sand beach has width of 100m or more. Density ranges of the sea applying to the CCT counts are determined as 0-3 for band 7, 0-16 for band 6, 0-25 for band 5, and 0-27 for band 4.

The density ranges 0-25 for band 4 used in the previous report have come to be amended as noted above.

5. Publications

No.

6. Problems

(1) Color enhancement of the shoreline and the ground pattern by means of the multi-bands color composition must be examined.

(2) Statistical discrimination of the high-tide limit and the low-tide limit can be examined provided that suitable two MSS scenes are given.

7. Data Quality and Delivery

No.

8. Recommendations

No.

9. Conclusions

It has become clear that a shoreline can be detected from the MSS digital data if suitable density boundary is fixed.

symbol / band	sea	land
	-	+
4	0-27	28-
5	0-25	26-
6	0-16	17-
7	0-3	4-

Table 1. Density division for land/sea boundary

Sept. 11, 1975		Oct. 27, 1976	
time	tide	time	tide
3^h13^m	51^{cm}	2^h11^m	15^{cm}
*9 49	209	8 52	232
15 17	116	*14 30	106
21 08	214	20 07	222
* nearest time when MSS data was taken		* nearest time when the field photo was taken	

Table 2. Predicted tide values at the time when MSS data and the field photograph were taken

Fig. 6. Sand beach near Ensyu-Nada

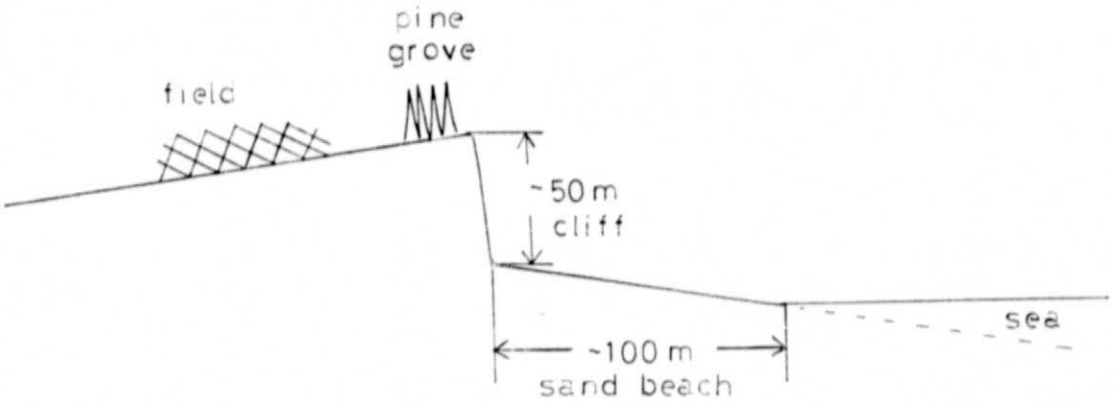

Fig. 7. Cross-section of the sand beach shown in Fig. 6

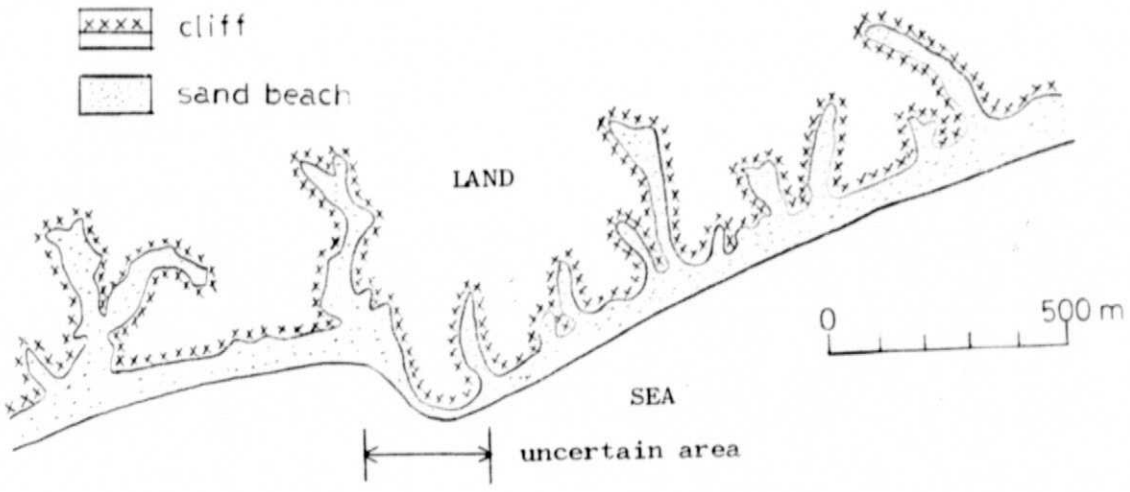

Fig. 8. Uncertain area in Fig. 5

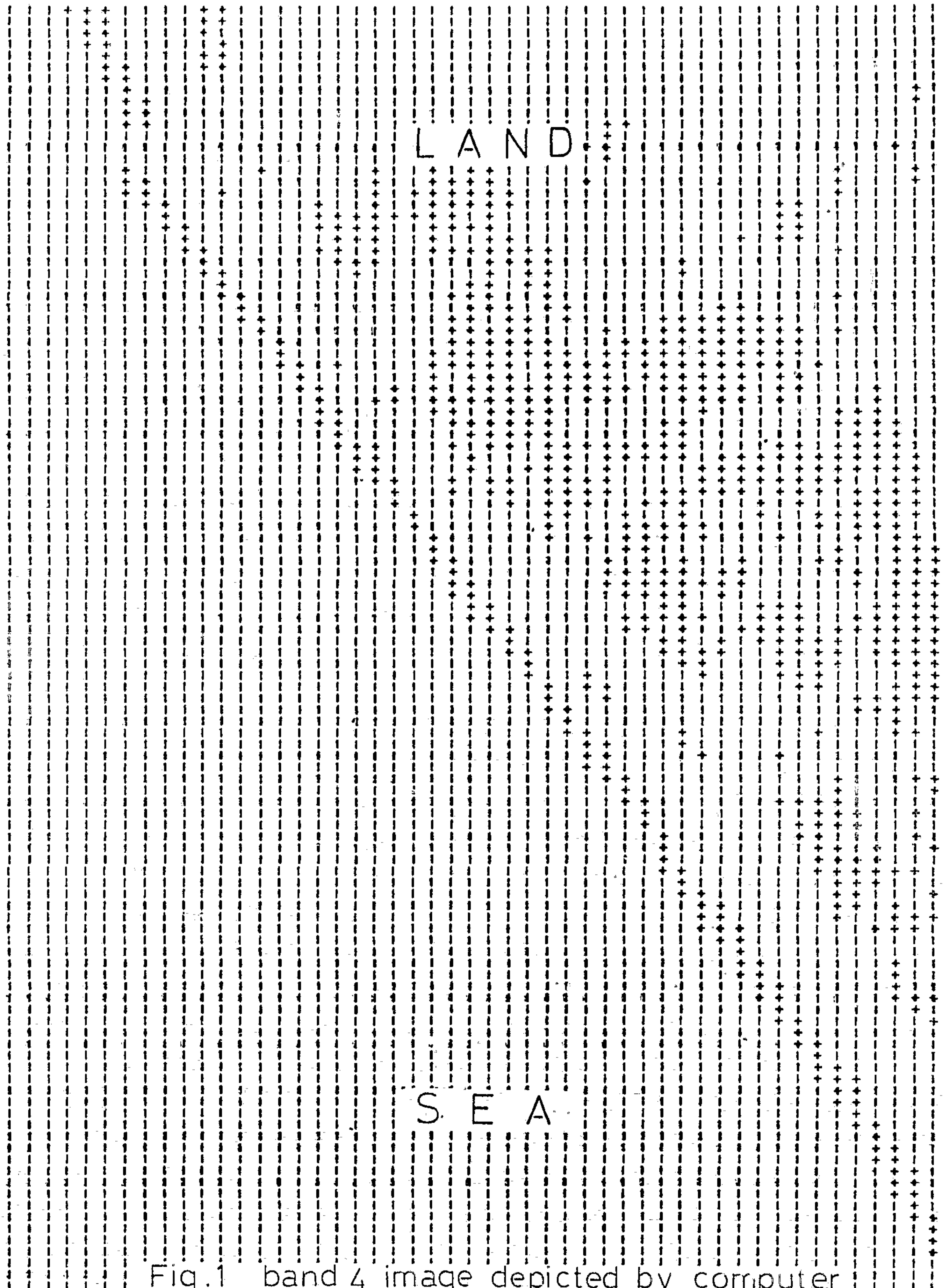

Fig.1 band 4 image depicted by computer

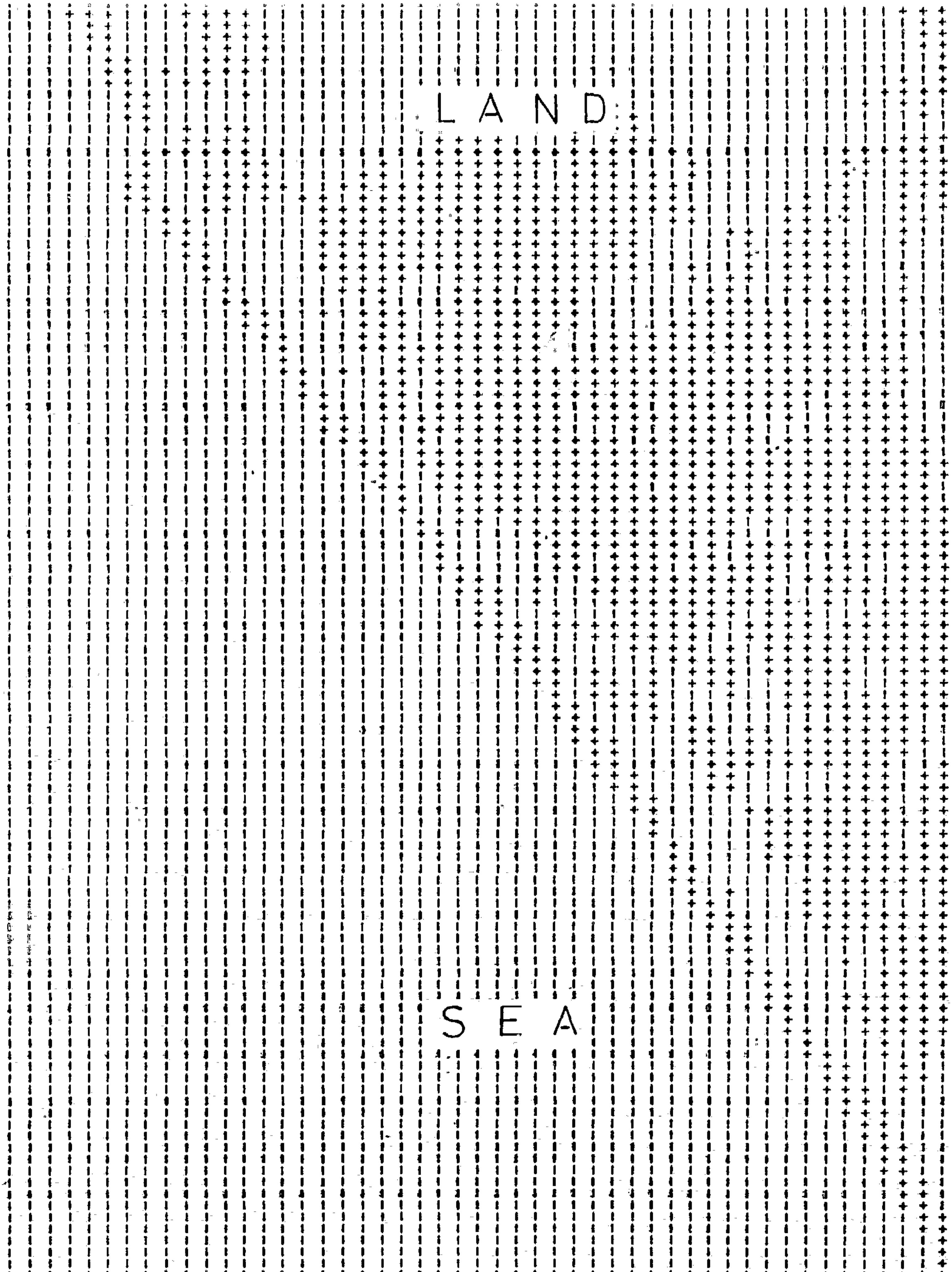

Fig.2 band 5 image depicted by computer

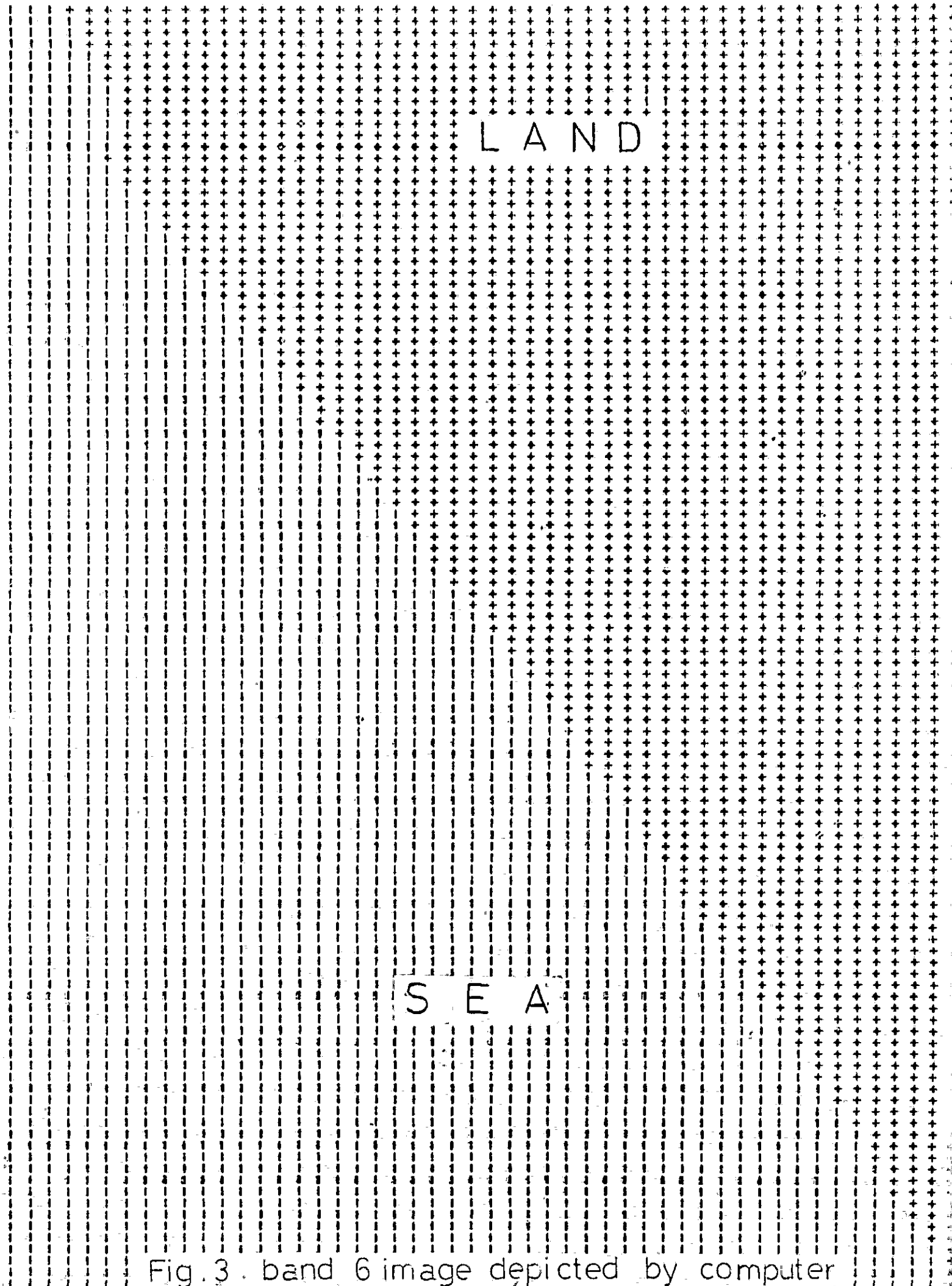

Fig. 3. band 6 image depicted by computer

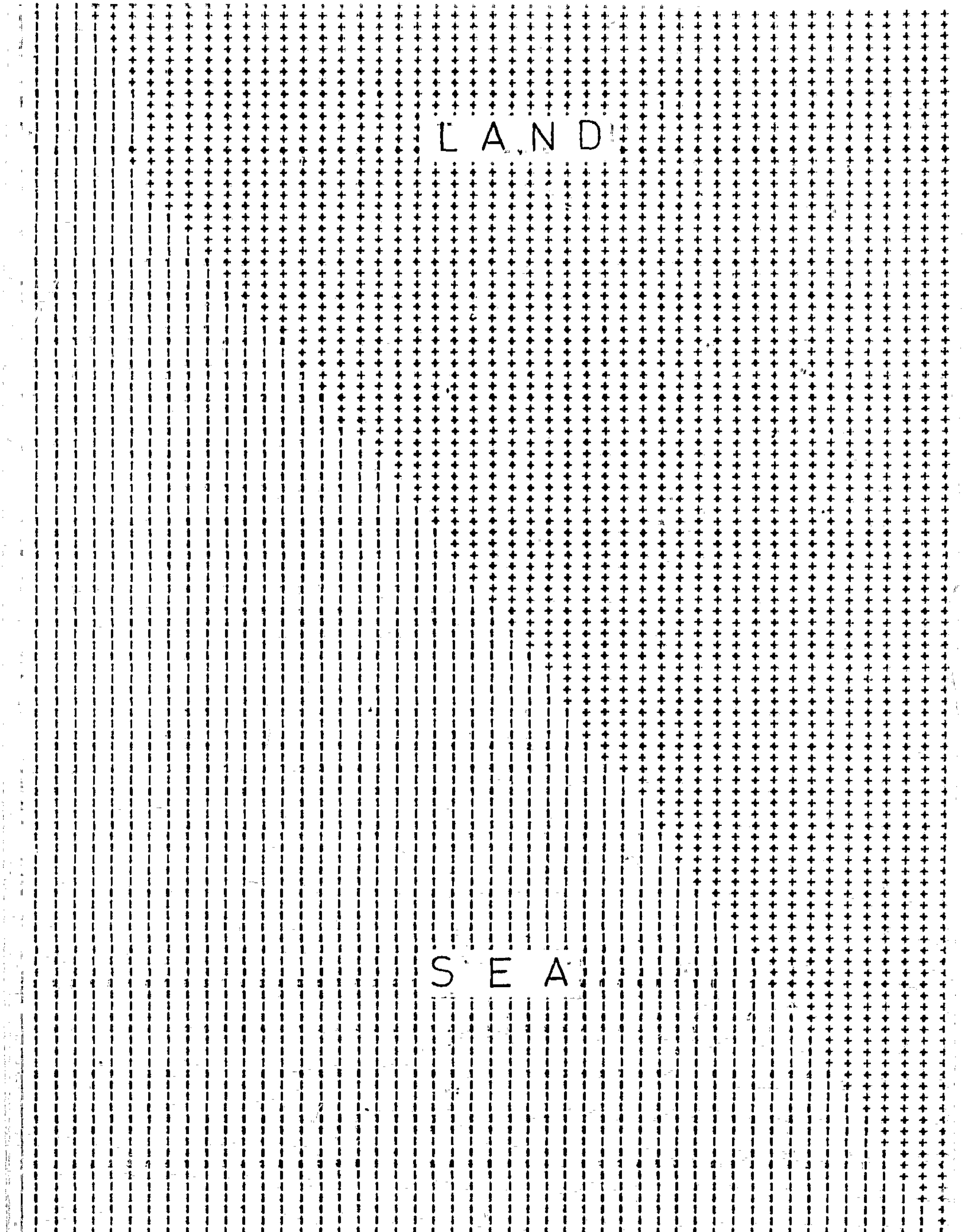

Fig 4 band 7 image depicted by computer

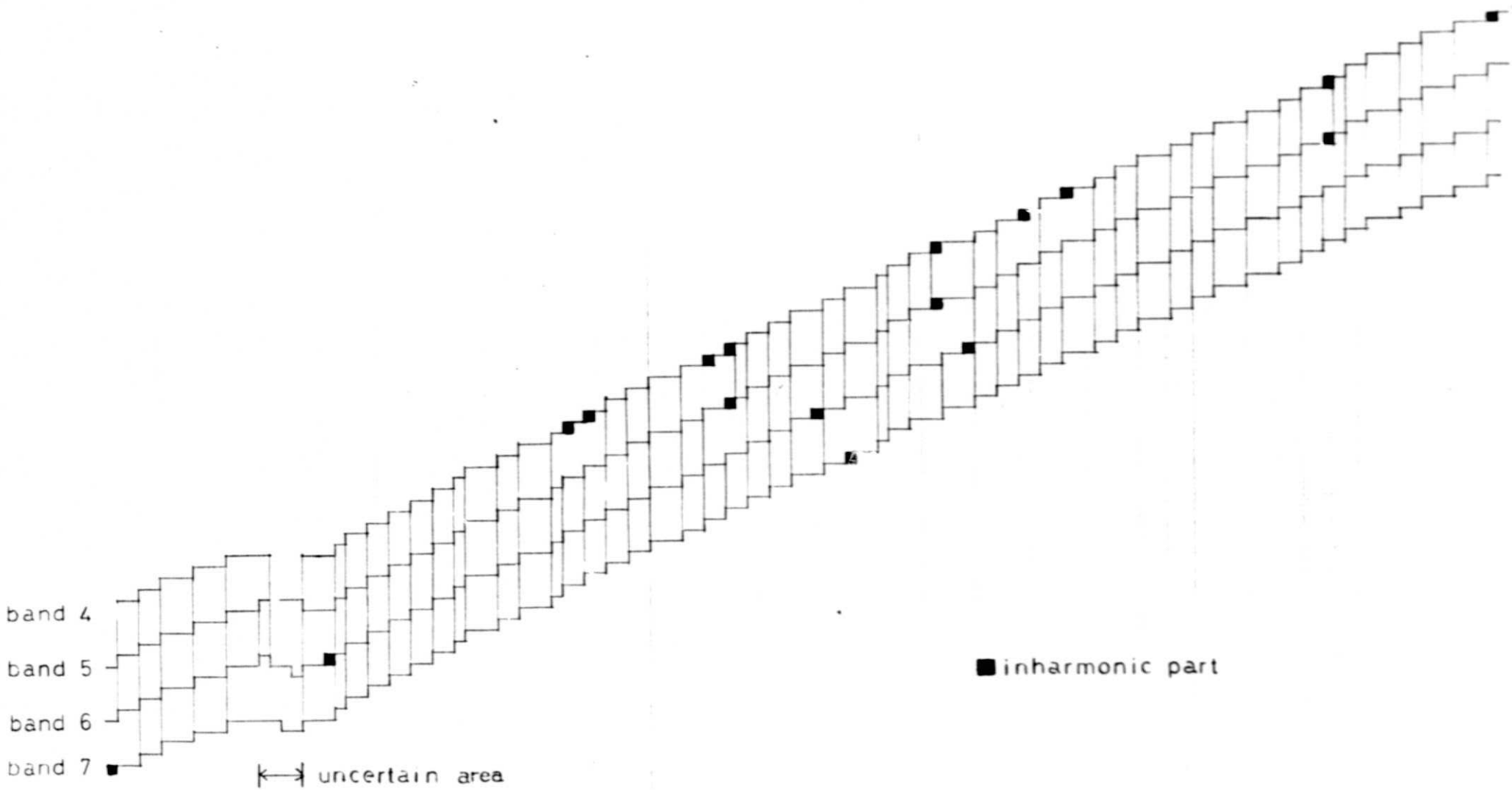

Fig. 5 shore-lines depicted in Fig. 1 through Fig. 4