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28990 Investigation of Environmental
Change Pattern in Japan
(Classification of Shorelines)

E7.6-10.17.0.
CR-146370

Dr. Daitaro SHOJI

Co-Investigator

Chief Hydrographer
Hydrographic Department
Maritime Safety Agency

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

(E76-10170) INVESTIGATION OF ENVIRONMENTAL
CHANGE PATTERN IN JAPAN: CLASSIFICATION OF
SHORELINES Quarterly Report (Science Univ.
of Tokyo (Japan).) 8 p HC \$3.50 CSCL 08J

N76-18591

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Quarterly Report

Original photography may be purchased from:
EROS Data Center
10th and Dakota Avenue
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Classification of Shorelines

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1. Introduction

Coastlines were classified into artificial coastlines (mainly reclaimed lands) and natural coastlines. In addition, efforts were made to disclose the situation of reclaimed lands.

Nowadays, projects of reclamation in the sea are undertaken in various parts of Japan, so that very useful and up-to-date information would be obtained if those situations would be made known by the LANDSAT MSS data.

2. Techniques

Some images of the approaches to Ise Bay taken on September 11th, 1975, were selected from among several images received. The selected images are of excellent quality with little coverage of clouds.

There are many reclaimed lands along the head of Ise Bay (Fig.1-A), while the coast along Kumano Nada Sea shows a rias coast (Fig.1-B) and the coast of Enshu Nada Sea shows a monotonous sandy beach (Fig.1-C). Accordingly, the area of Ise Bay and its vicinity was selected as the most suitable test site.

Qualitative analysis on black-and-white bulk positives, as many researchers already reported, is quite useful for classification of coastlines (Fig.2).

Generally, the coastline becomes more monotonous as the composition of materials changes from coarse to fine grain. On the other hand, the coastline of a reclaimed land is mostly close to a straight line.

The situation of reclamation can be known by the density of image in band 7 and the distribution of muddy sea water in the vicinity of the reclaimed land in band 4 (Fig.3).

The sea fronting a rias coast is deep, so that the image of band 7 shows the exact coastline. In the case of a sandy beach, however, it is

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difficult to identify the coastline from band 7 because the osmosis of sea water to sand changes according to the condition of the sandy beach.

As band 4 and band 5 have an image of muddy sea water, it is also difficult to identify the coastline.

3. Accomplishments

- a) Band 7 image (Fig.4) shows the state of the reclaimed lands at the head of Ise Bay very well.
- b) Comparison of band 4 (Fig.5) with band 7 (Fig.4) shows the existence of water pools on reclaimed lands.
- c) Fig.6 and Fig.7 show Toyohashi Harbor. Band 7 (Fig.6) also shows the state of reclaimed lands very well.
- d) The history and the state of each reclaimed land are now under investigation.
- e) Furthermore, it is planned to make comparison of the ground truth with CCT data.
- f) Classification of natural coastlines will be made by using CCT.

4. Significant Results

It was found in the band 7 that the image density of some parts of reclaimed lands had the same density with that of the sea. (Fig.4 and Fig.6) It will be solved by making a CCT analysis.

5. Publications

No.

6. Problems

No.

7. Data Quality and Delivery

Band 4 and band 5 are of worse quality than band 7. Images of the same quality would be desirable.

8. Recommendations

No.

9. Conclusions

From the results of the present qualitative analysis, it is certain that more effective results will be obtained by making a quantitative analysis.



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Fig. 1 Selected test site
 A; reclaimed lands B; rias coast C; sandy beach



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Fig. 2 Band 7 image

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Fig. 3 Band 4 image



Fig. 4 Reclaimed lands at the head of Ise Bay (band 7)



Fig. 5 Reclaimed lands at the head of Ise Bay (band 4)

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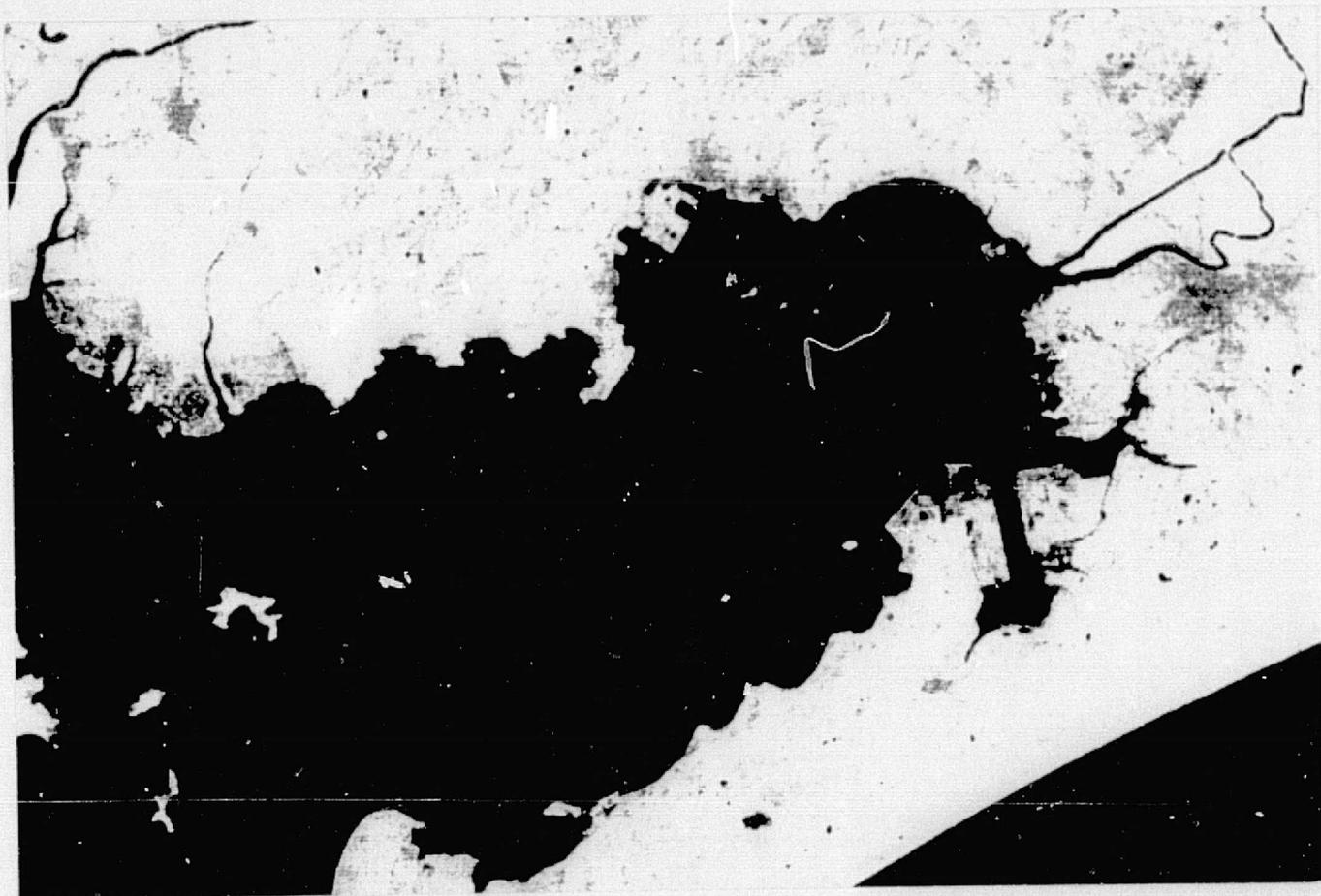


Fig. 6 Reclaimed lands in Toyohashi Harbor (band 7)

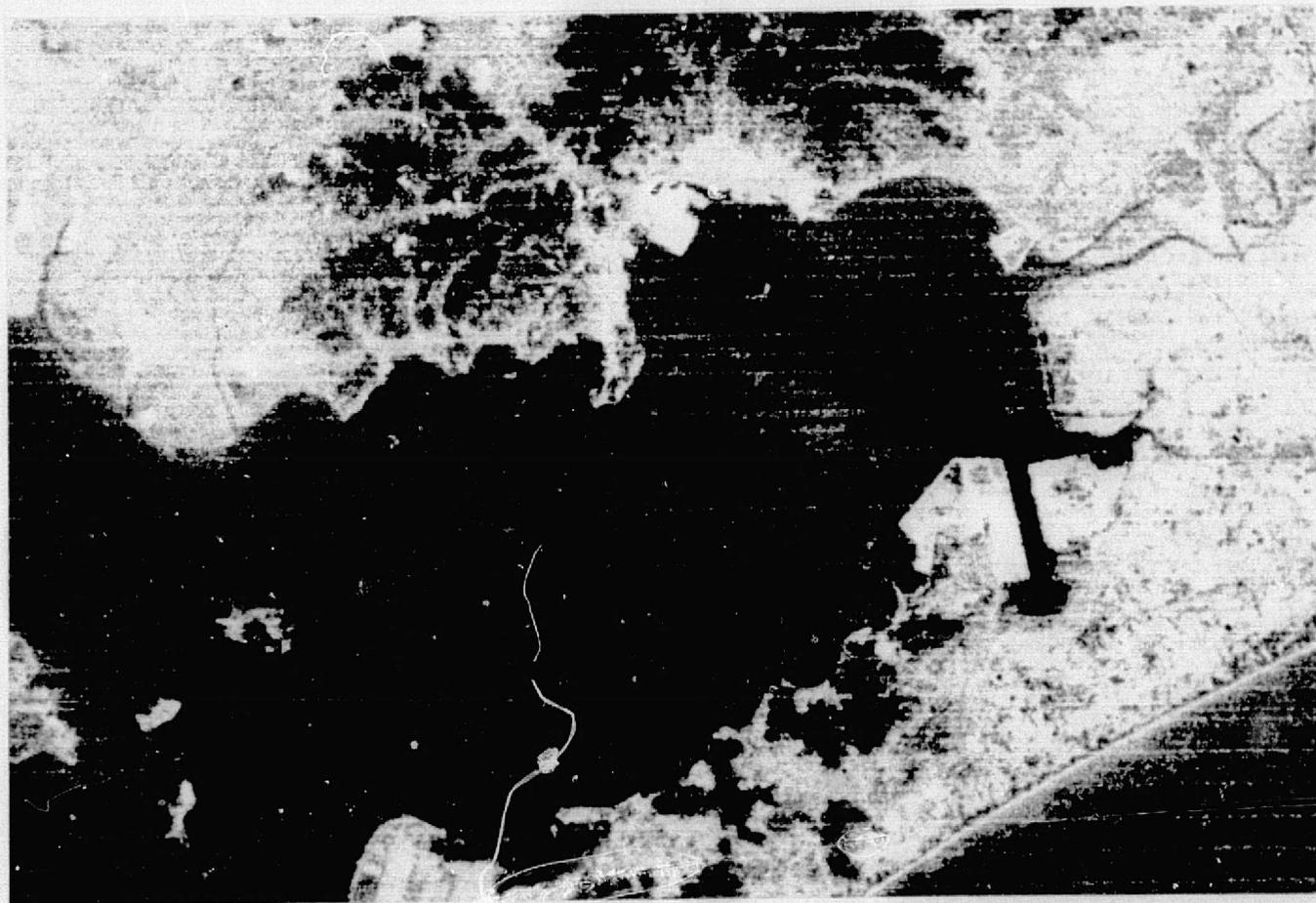


Fig. 7 Reclaimed lands in Toyohashi Harbor (band 4)