

Reprinted from

**Symposium on
Machine Processing of
Remotely Sensed Data**

June 21 - 23, 1977

The Laboratory for Applications of
Remote Sensing

Purdue University
West Lafayette
Indiana

IEEE Catalog No.
77CH1218-7 MPRSD

Copyright © 1977 IEEE
The Institute of Electrical and Electronics Engineers, Inc.

Copyright © 2004 IEEE. This material is provided with permission of the IEEE. Such permission of the IEEE does not in any way imply IEEE endorsement of any of the products or services of the Purdue Research Foundation/University. Internal or personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution must be obtained from the IEEE by writing to pubs-permissions@ieee.org.

By choosing to view this document, you agree to all provisions of the copyright laws protecting it.

SHIP DETECTION FROM LANDSAT

M. J. MCDONNELL AND A. J. LEWIS*

Remote Sensing Section, Physics and
Engineering Laboratory, Department of
Scientific and Industrial Research,
Lower Hutt, New Zealand

Recent inspection of LANDSAT CCT printouts of New Zealand's Wellington Harbour and Cook Strait revealed that the detection of ships and the identification of related ship parameters are possible. Experience has shown that MSS band 7, because of low radiance values from water and the resultant high S/N ratio, is the best MSS band for a "quick look" inspection of CCT printouts for possible ships. Following verification of the target on the other MSS bands the ship's size, orientation, state of motion, and direction of movement, can be determined from the total number of pixels occupied by the target for each MSS band, the orientation of these pixels, and the target's maximum and total pixel radiance values.

Although the smallest positively identified vessel was 127 m in length, in theory 30 m long vessels should be identifiable under favourable conditions.

This paper presents the procedures used for detecting ships, and discusses the problems and limitations of the overall technique as related to ship parameters, sea state and turbidity, pixel overlap, and relative geometric fidelity between pixels.

*On sabbatical leave from Department of
Geography and Anthropology, Louisiana
State University, Baton Rouge, Louisiana