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Catalogue of Geo-Referenced NOAA AVHRR Satellite Data of the Beaufort Sea, 1980 -1991

by
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Sidney, British Columbia

Department of Fisheries and Oceans
Institute of Ocean Sciences
Sidney, British Columbia

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No. 42**



Fisheries
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Canadian Contractor Report of Hydrography and Ocean Sciences

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Les établissements des Sciences et levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports en décembre 1981. Une liste complète de ces publications figure dans le volume 39, Index des publications 1982 du *Journal canadien des sciences halieutiques et aquatiques*. La série actuelle a commencé avec la publication du rapport numéro 1 en janvier 1982.

**CANADIAN CONTRACTOR REPORT OF HYDROGRAPHY
AND OCEAN SCIENCES NO.42**

MARCH 1992

**CATALOGUE OF GEO-REFERENCED NOAA AVHRR SATELLITE DATA
OF THE BEAUFORT SEA, 1980 - 1991**

BY

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SIDNEY, BRITISH COLUMBIA**

FOR

**INSTITUTE OF OCEAN SCIENCES
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ABSTRACT

G. A. Borstad Associates Ltd.. 1992. Catalogue of Geo-Referenced NOAA AVHRR Satellite Data of the Beaufort Sea, 1980-1991. Can. Contract. Rep. Hydrogr. Ocean Sci. No 42 49 p.

As part of research studies at the Institute of Ocean Sciences (Department of Fisheries and Oceans) in Sidney, British Columbia, a large collection of digital satellite imagery has been archived. This catalogue presents that part of the collection which has been geo-referenced for the western Canadian Arctic. The data is from the Advanced Very High Resolution Radiometer (AVHRR) on board the National Oceanic and Atmospheric (NOAA) series weather satellites. The photographic catalogue has been selected to represent the best example per calendar week for the period 1980 to 1991.

Keywords: Beaufort Sea, arctic, remote sensing, NOAA AVHRR, satellite imagery, archives, catalogue.

RESUMÉ

G. A. Borstad Associates Ltd.. 1992. Catalogue of Geo-Referenced NOAA AVHRR Satellite Data of the Beaufort Sea, 1980-1991. Can. Contract. Rep. Hydrogr. Ocean Sci. No. 42 49 p.

Dans le cadre des recherches effectuées à l'Institut des sciences de la mer (Ministère des Pêches et des Océans) à Sidney, Colombie-Britannique, une collection importante d'imagerie satellitaire numérisée a été archivée. Ce catalogue présente la partie de cette collection qui a été corrigée géométriquement et qui comprend la région ouest de l'Arctique canadien. Les données viennent de l'Advanced Very High Resolution Radiometer (AVHRR) à bord des satellites de la série National Oceanic and Atmospheric Administration (NOAA). Ce catalogue photographique inclut le meilleur exemple de chaque semaine civile pour la période de 1980 à 1991.

Mots clefs: mer de Beaufort, Arctique, télédétection, NOAA AVHRR, imagerie satellitaire, catalogue

ACKNOWLEDGEMENTS

Humfrey Melling provided access to the satellite imagery at the Institute of Ocean Sciences. As the Scientific Authority, Brian Smiley contributed to the catalogue's design and reviewed the manuscript. Jim Gower and John Wallace provided scientific and technical support for the Image Processing Laboratory at the Institute of Ocean Sciences. Charmaine Elgood, of G. A. Borstad Associates, reviewed, selected and prepared the satellite data and produced the photographic catalogue. The manuscript and photography were the responsibility of Lynne Armstrong, advised and edited by Gary Borstad and Scott Akenhead of G. A. Borstad Associates. Island Blue Print Co. Ltd. of Victoria, B.C., produced the colour copying and Fleming Express Press of Victoria provided the cover printing and binding.

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1. INTRODUCTION

Remote sensing from satellites provides a unique data base covering large and remote areas at short time intervals. As part of research studies at the Institute of Ocean Sciences (IOS), Department of Fisheries and Oceans, in Sidney, British Columbia, a large collection of digital satellite imagery has been archived. This collection includes data for the north-east Pacific and western Arctic, from many research satellites including NOAA, NIMBUS, LANDSAT and GEOS. The largest part of the collection is digital imagery for the western Canadian Arctic from the Advanced Very High Resolution Radiometer (AVHRR) on board the U.S. National Oceanic and Atmospheric (NOAA) series weather satellites. These data offer an invaluable window on this remote area, revealing ice structure and movement, water temperature and turbidity, cloud cover, land temperature, and snow and ice coverage.

This catalogue will make the IOS archives more accessible and useful for scientists of all disciplines, by providing an up-to-date listing of IOS archive holdings of AVHRR imagery of the Beaufort Sea as of March 1992.

2. HISTORY AND PURPOSE OF THE IOS DATA ARCHIVE

The IOS Beaufort Sea collection began in the late 1970's and is still growing. The archive has not been built up systematically, but resulted from a variety of unrelated research projects over many years. It therefore reflects the time periods and locations of interest of those studies. Much of the Beaufort collection is from the activities of Dr. H. Melling of IOS, with funding from the Program for Energy Research and Development (PERD). Most of the data listed in this catalogue resides on magnetic tape at IOS, but some of the geo-corrected data is held by G.A. Borstad Associates Ltd.

3. THE NOAA SATELLITE SERIES

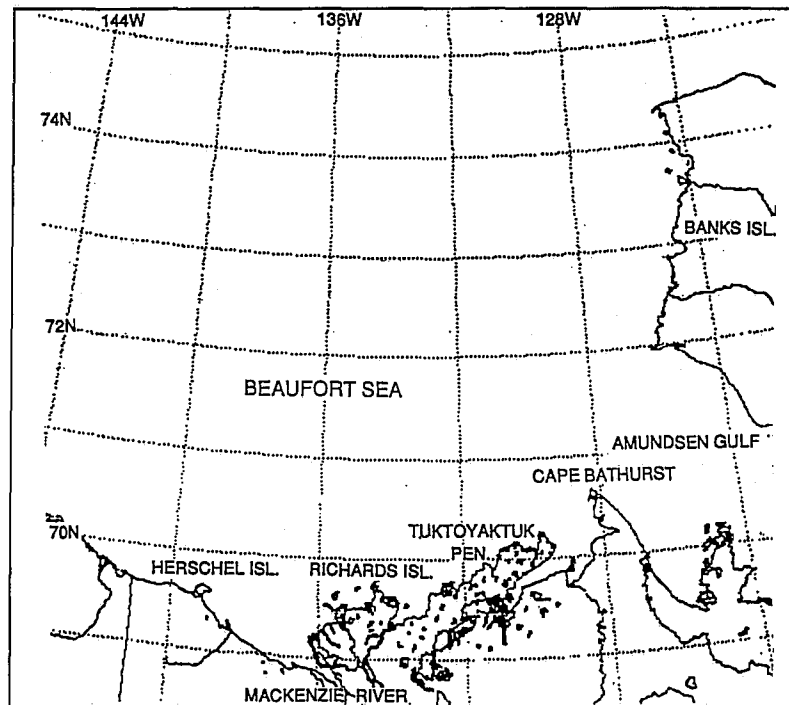
TIROS (Television and Infrared Observation Satellite) and the successive TOS (TIROS Operational System), ITOS (Improved TIROS Operational System) and TIROS-N/NOAA series have been the principal operational meteorological satellite systems for the United States and much of the world since 1960. The current third-generation series of American polar-orbiting weather satellites originated with Tiros-N in 1978 and has included six NOAA series satellites, which have been successively replaced as their orbit decayed or their sensors failed. Each of the NOAA satellites has been equipped with an AVHRR, a scanning radiometer which covers a 2,350 kilometer wide swath. This sensor gathers electromagnetic energy reflected, emitted or backscattered from the earth below its path with a spatial resolution of approximately 1.1 kilometers. AVHRR has spectral channels in the visible (.58-.68 μm), near infrared (.725-1.1 μm), middle infrared (3.55-3.93 μm), and thermal infrared (10.3-11.3 μm). Some of the later sensors also have a 11.5-12.5 μm channel. The visible and near infrared channels have been used to identify clouds, vegetative indices, land and water boundaries as well as snow and ice extent. Since the sensor responds to the cumulative signal from the target and the intervening atmosphere, including sun glint, clouds, fog, and atmospheric aerosols and particles, **it is dangerous to use the raw imagery for any but the most localized or simple analyses.**

4. IMAGE NAVIGATION

The raw satellite image is distorted by the earth curvature and by the scan geometry of the sensors. To allow comparison with maps and for comparison of images taken at different times, most of the images in the IOS collection have been geometrically rectified or navigated. Reflecting the fact that the work was done for a variety of projects over many years, the imagery included in this catalogue has been navigated to either a conic or an equi-rectangular projection at 1.3, 1.5 or 2.9 km resolution. The rectification process used at IOS gives good agreement with the World Data Base 2 digital coastline such that disagreements between the coastline and the image are never more than one pixel. A coastline

map has been overlaid on the images in this catalogue to aid in locating the features.

Curving lines occasionally appear across the top of the imagery in this catalogue. These arise where the tracking antenna loses synchronization with the data transmission from the satellite, and most often just before the sensor goes beneath the antenna horizon. The Beaufort Sea is very near the tracking horizon for both the receiving facilities used to acquire this data (Oceanography Department, University of British Columbia, Vancouver; Atmospheric Environment Service, Edmonton).



Map of the Southern Beaufort Sea with place names.

5. METHOD OF ENHANCEMENT:

The Appendix listing in this catalogue includes all of the digital AVHRR data of the Beaufort Sea in the IOS archives. However, the photographic catalogue displays only one image each calendar week. As a rule, the image data was originally archived because it was cloud-free, but this was not always the case.

The image with the least cloud each week was chosen for the catalogue, but in some weeks, only a cloudy image was available. The data was photographed from the video screen of the IOS PDP11/44 Adage system and the photographs later colour photocopied to make the catalogue.

Considerable care is required in interpreting the imagery in this catalogue. Because of changes in illumination through the seasons and differences in viewing geometry between orbits and cloud cover, the digital level of the imagery can differ strongly even between consecutive days. The image digital values were all colour coded and individually enhanced using a rainbow-like lookup table progressing from black to blue, green, yellow, red and white. The enhancement varies considerably from image to image. For imagery for the months of April through September, where the visible band data is shown, this sequence indicates increasing radiance, usually with open water depicted as dark blue, and snow and ice shown as either yellow, red or white depending on its brightness, a function of albedo, and illumination, among other factors. For winter months (typically October through the end of March) where the sun is below the horizon, thermal infrared band 4 data are shown. Cloud, thin ice and leads or small patches of open water all show as blue in the band 4 data, while the ice and land are depicted as yellow, red or white. Cloud can generally be recognized by its soft edges, while ice has sharper boundaries. Possible confusion may arise from the gradations in colour over the pack-ice. Cloud overlaying the ice pack will appear as blue (for example December 4, 1985).

Depending on the contrast range, the ice may all show as yellow, or yellow and red/red-brown or yellow/red/white all on the same day. This should not be read as ice thickness or any specific measurement, because the colour range is dependent on the recorded brightness level which varies from day to day. The same care must be taken when looking at the water, which may show as blue or black. The pseudo-colour range has been manipulated to simplify the patterns, rather than to compare days or to show the full digital range of the data.

6. SOME APPLICATIONS AND EXAMPLES:

The southern Beaufort Sea is a good target for the AVHRR because of the high contrast, at thermal and visible wavelengths, between ice, water and land. In summer months the warm and turbid Mackenzie River water can be easily distinguished from much colder, clearer waters off the Tuktoyaktuk Shelf. Visible AVHRR bands, particularly band 1, respond more or less linearly with total suspended particulate load (Figure 1). The infrared bands delineate plumes of warm water extending out of the mouth of the Mackenzie River (Figure 3 and frontispiece image to the colour catalogue). With *in situ* temperature measurements, these images can be empirically calibrated. The ice itself is bright and is well imaged with the visible bands in the summer (Figure 2, 4 and 5). In the winter, there is sufficient thermal contrast between ice and water to map the larger leads.

An eddy in Amundsen Gulf, formed from the Beaufort Gyre, a circulation pattern which moves the ice south and west from Banks Island, is outlined by the trailing ice edge in Figure 6. In this same area the formation of new ice in October shows in Figure 7. Ice movement can be followed by watching the large floe of characteristic rounded triangular shape, first seen in the December 29, 1985 image, migrate westward to the image edge, on April 08, 1986. Interesting details of water circulation patterns are most evident in the enhanced thermal infrared band data.

Many of the IOS studies in physical oceanography have focused on ice structure and water circulation (Carmack *et al.* 1989, Marko and McAleese 1992, Cherniawsky *et al.* 1987). The PERD Projects "Beaufort Sea Ice Motion" and "Subsurface Ice Characterization" (Melling) and "Mesoscale Ice Deformation and Limiting Stress in the Southern Beaufort Sea" (Topham) significantly increased the collection. There have also been several ecological studies of bowhead whales and other marine mammals which used satellite imagery to explain the movements and distributions of these animals (*eg.* Borstad 1985, Thomson *et al.* 1985, Fissel *et al.* 1987). Satellite imagery has also been used in support of studies of MacKenzie Shelf circulation and water chemistry (MacDonald *et al.* 1989).

7. DATA AVAILABILITY

Most of the data in the IOS archives is owned by the Department of Fisheries and Oceans, and is available for scientific studies for the cost of handling. Inquiries and requests for data should be addressed to G.A. Borstad Associates Ltd., 9865 West Saanich Road, Sidney, British Columbia, Canada, V8L 3S1.
Telephone: 604-656-5633 Fax: 604-656-3646

8. SELECTED BIBLIOGRAPHY

Borstad, G. A., M. McNeill and L. L. Armstrong. 1988. The 1987 seasonal ice cycle in the Canadian Beaufort Sea. Unpublished report by G. A. Borstad Associates Ltd. to Dept Fisheries and Oceans, Sidney, B.C. DSS contract # 06SB.FP941-7-0536/A. 45p.

Borstad, G. A. 1985. Water colour and temperature in the southern Beaufort Sea: remote sensing in support of ecological studies of the bowhead whale. Can. Tech. Rep. Fish. Aquat. Sci. 1350, 69p + figs.

Carmack, E. C., R. W. MacDonald and J. E. Papadakis. 1989. Water mass structure and boundaries in the Mackenzie Shelf Estuary. J. Geophys. Res., 94:18043-18055.

Cherniawsky, J. Y., G. A. Borstad, D. N. Truax and R. C. Kerr. 1986. Collection and analysis of satellite imagery for studying Beaufort Sea ice movements. Unpubl. report by G. A. Borstad Associates Ltd. to Dept. Fisheries and Oceans. Contract 06SB.FP941-5-0338, 34p + figs.

Fissel, D. B., J. R. Marko, J. R. Birch, G. A. Borstad, D. N. Truax, and R. C. Kerr. 1987. Water Mass distributions, In: W.J.Richardson (ed), Importance of the eastern Alaskan Beaufort to feeding bowhead whales, 1985-1986. Unpubl. report by LGL Ecol. Res. Assoc. Inc. to the US Minerals Management Service, Reston VA. 547p.

MacDonald, R. W., E. C. Carmack, F. A. McLaughlin, K. Iseki, D. M. MacDonald and M. C. O'Brien. 1989. Composition and modification of water masses in the Mackenzie Shelf and Estuary. *J. Geophys. Res.*, 94:18055 - 18070.

Marko, J. R. and N. McAleese, 1992. The development and testing of automated techniques for extracting ice movement and geometry data from remote sensing images. Project Report for Supply and Services, Canada. Contract FP941-8-7273/01-SS, 64p + figs. and appen.

Marko, J. R. 1975. Satellite observations of the Beaufort Sea ice cover. Beaufort Sea Project Technical Report no. 34, 137p.

Thomson, D. H., D. B. Fissel, J. R. Marko, R. A. Davis and G. A. Borstad. 1985. Distribution of bowhead whales (*Balaena mysticetus*) in relation to hydro-meteorological events in the southeastern Beaufort Sea, 1980-1983. Unpubl. report by LGL Environmental Research Associates Limited, Arctic Sciences Ltd. and G.A. Borstad Ltd. for the Environmental Studies Revolving Fund and Indian and Northern Affairs Canada, 165p.

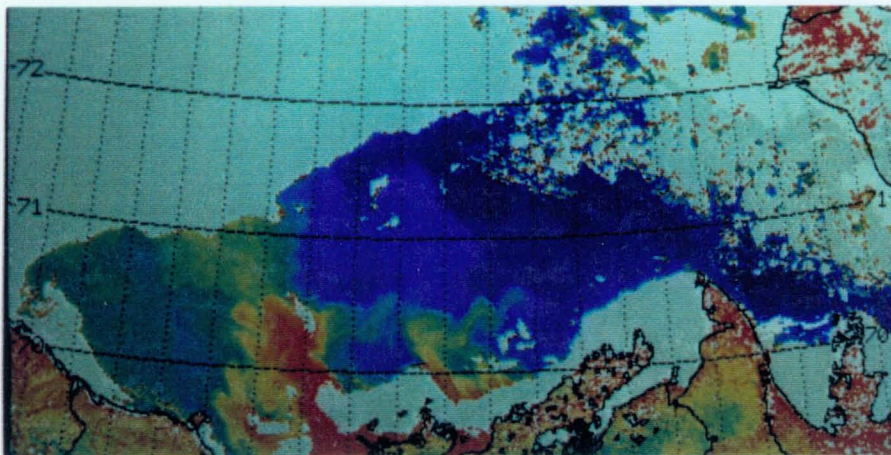


Figure 1. June 23, 1987. Band 1 showing turbidity plume from the MacKenzie River (cloud mask is white, ice mask is grey).

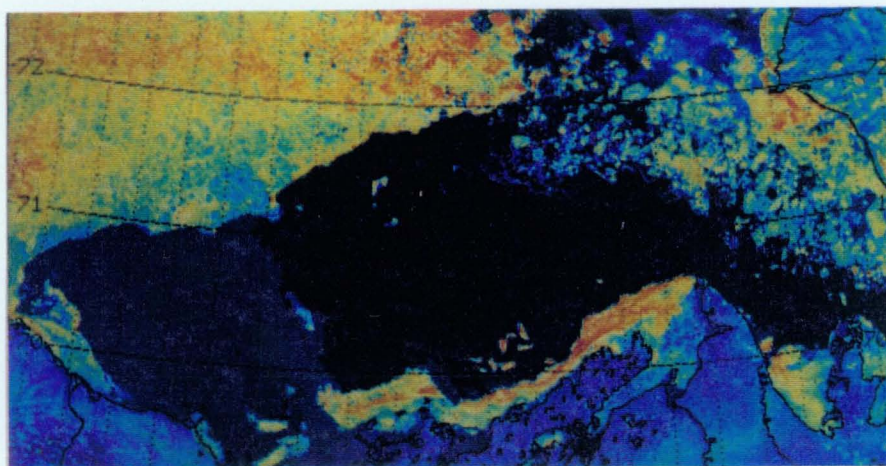


Figure 2. June 23, 1987. Band 2 showing ice and water boundaries (no masks).

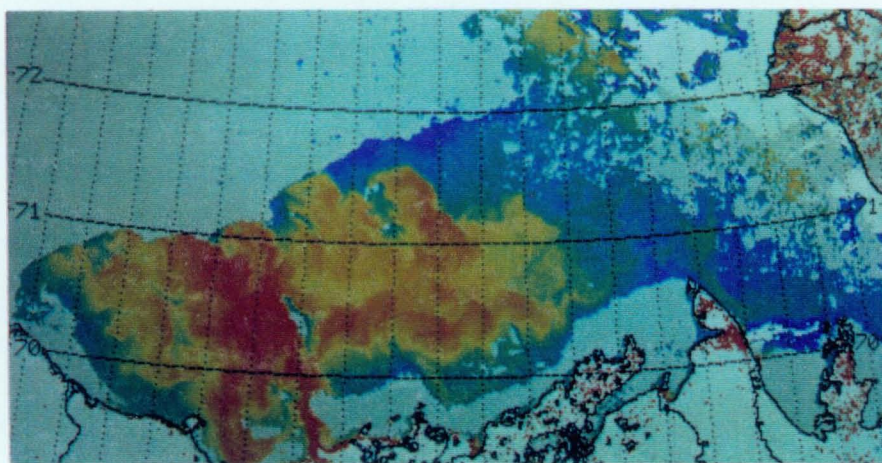


Figure 3. June 23, 1987. Band 4 showing thermal plume (cloud mask is white, ice mask is grey).

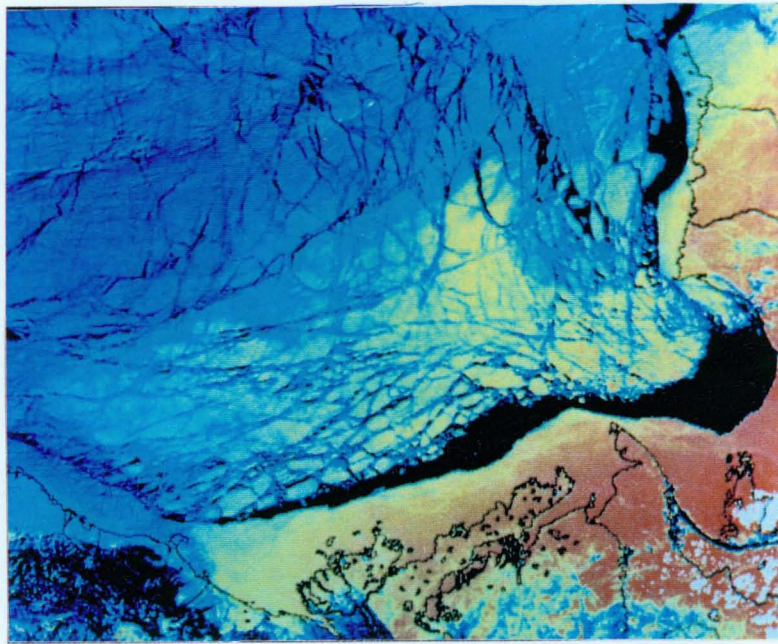


Figure 4. April 28, 1991. Band 2 enhanced severely, allowing the water to go to black, reveals ice lead structure.

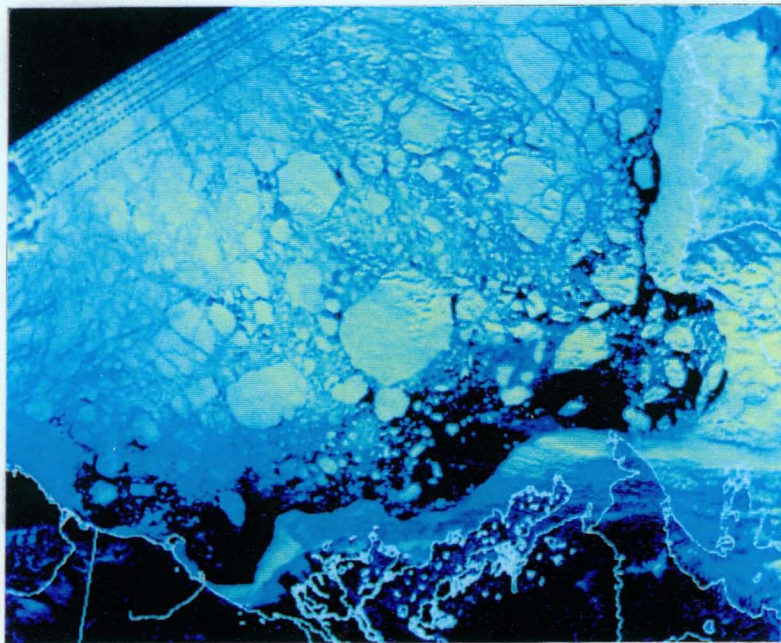


Figure 5. June 12, 1990. As the warm season progresses Band 2 clearly portrays ice break-up and open water areas.

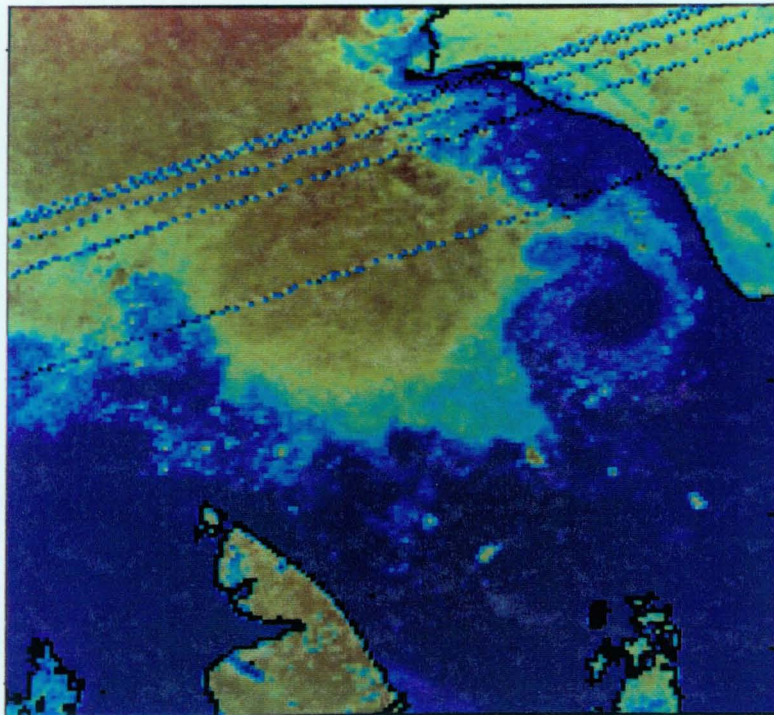


Figure 6. August 12, 1987. Band 2 enlargement of the area between Bathurst Peninsula and Banks Island, showing the ice edge and the Beaufort Gyre.

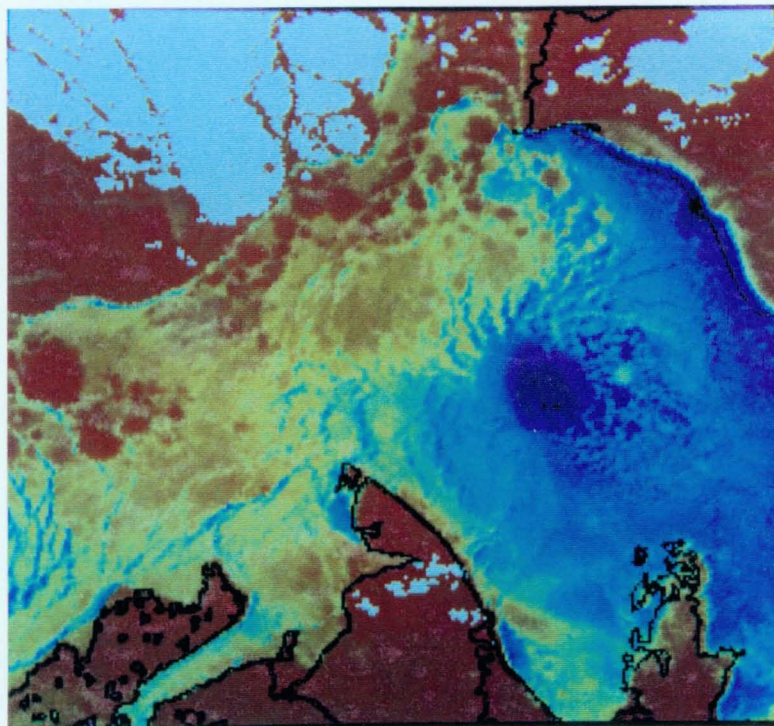
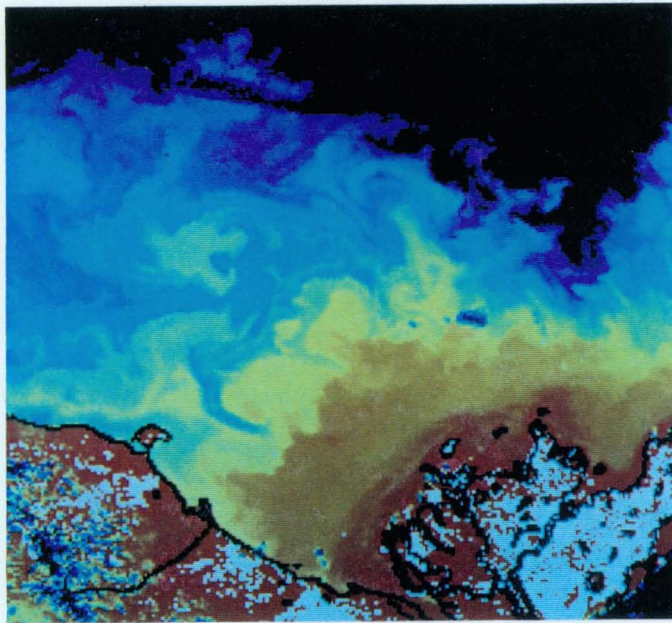
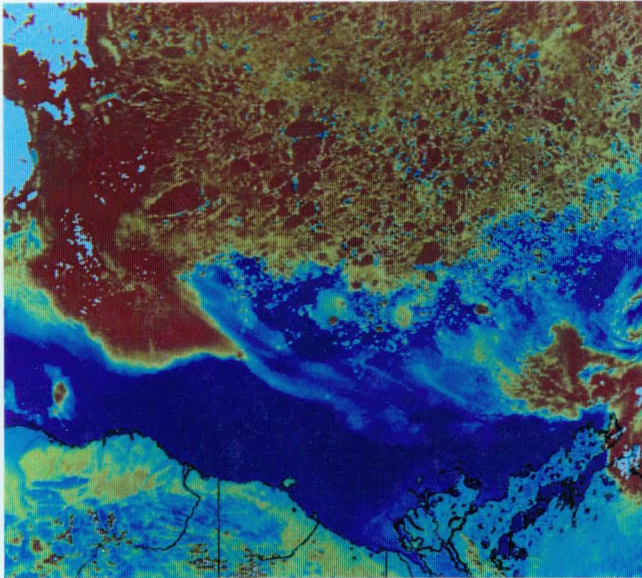


Figure 7. October 22, 1984. Band 2. New ice begins to form showing the circulation pattern of the Beaufort Gyre in this enlargement of the area above Bathurst.

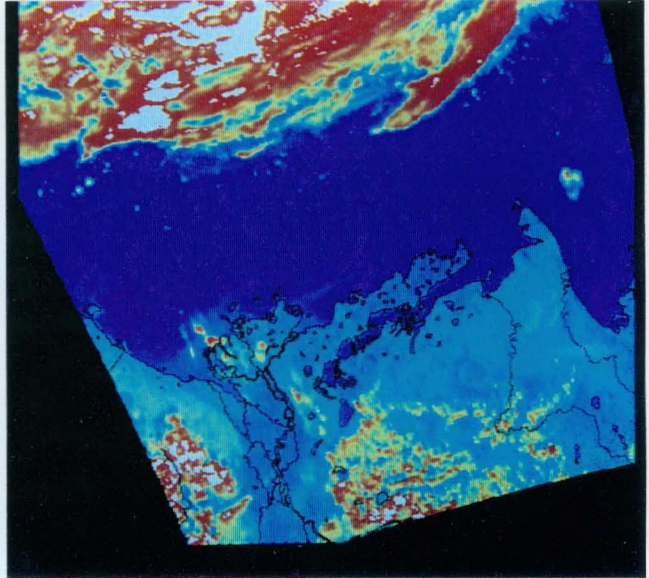
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**Institute of Ocean Sciences
Catalogue of Geo-Referenced
Satellite Data
Beaufort Sea 1980 - 1991**

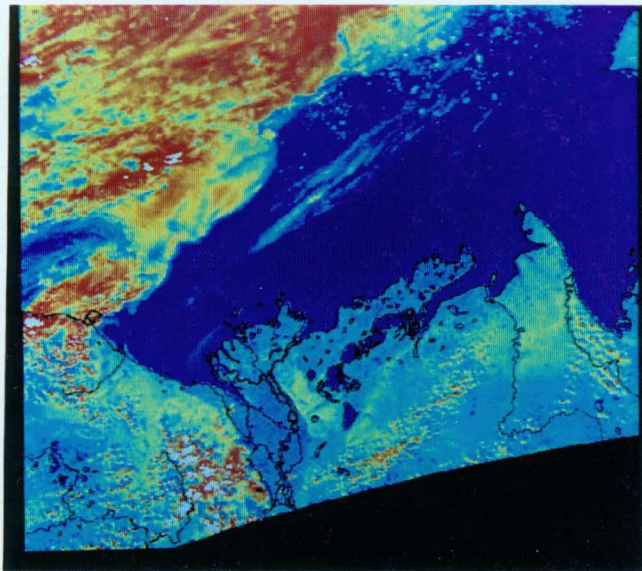




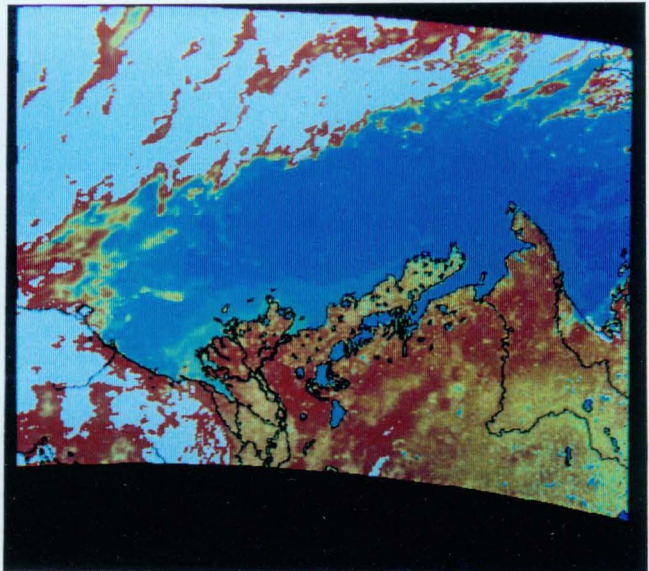
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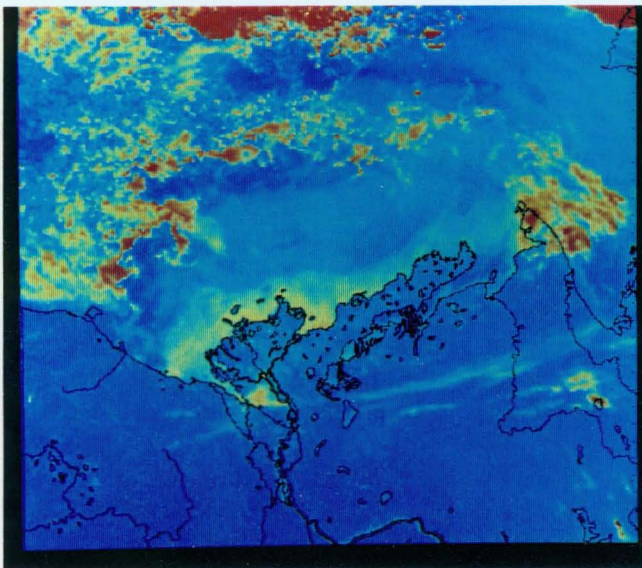
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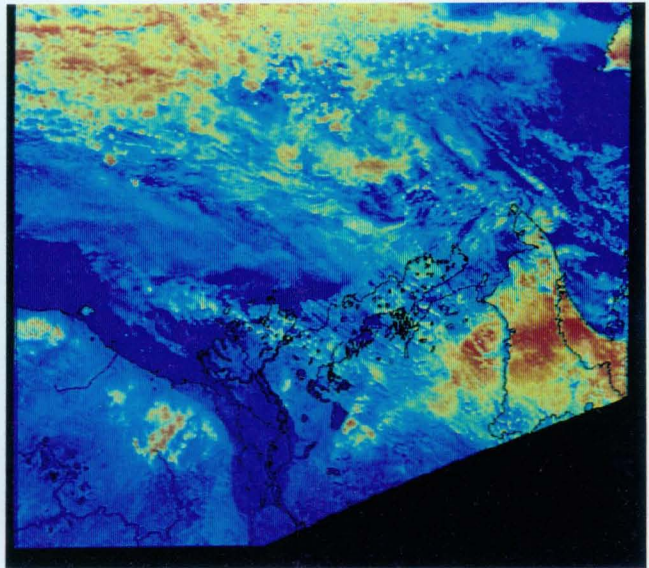
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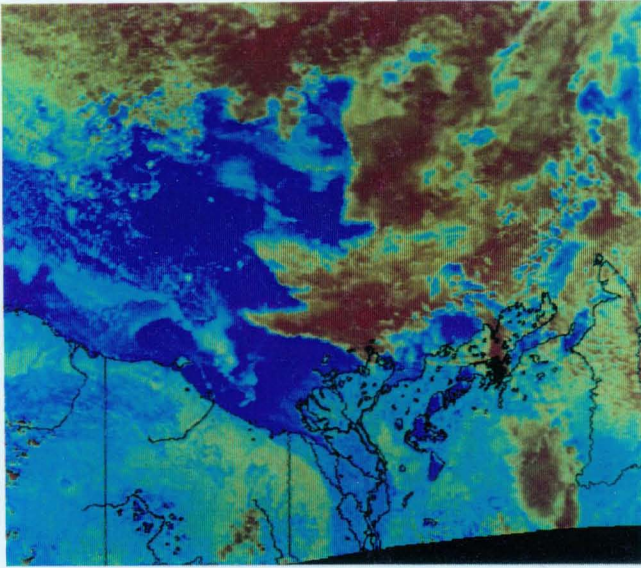
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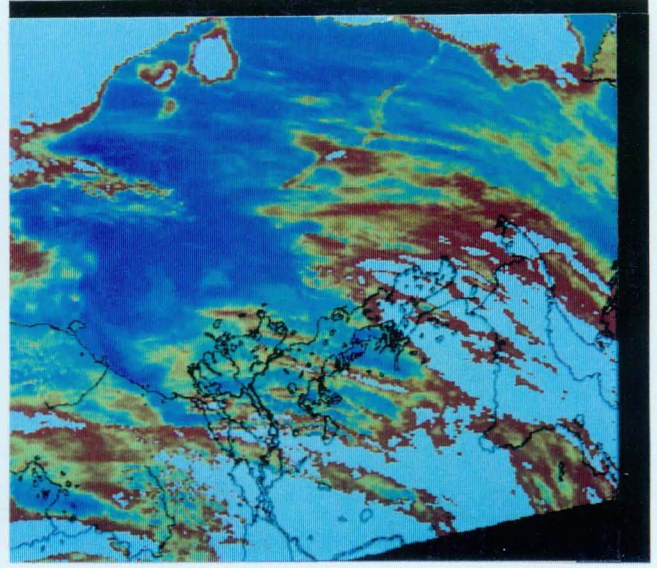
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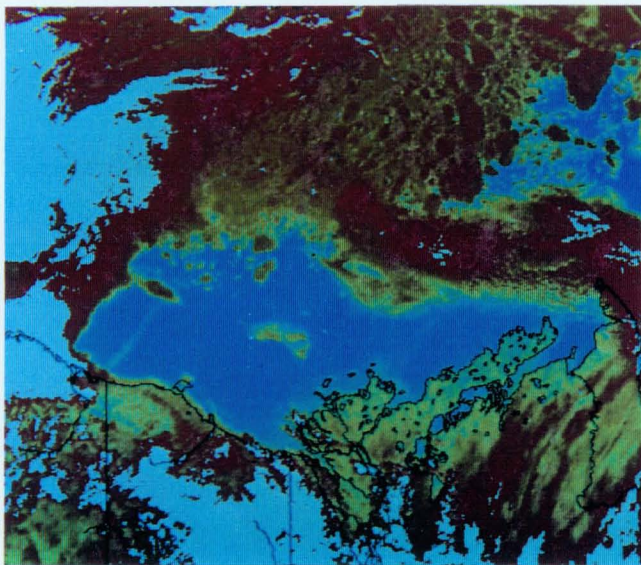
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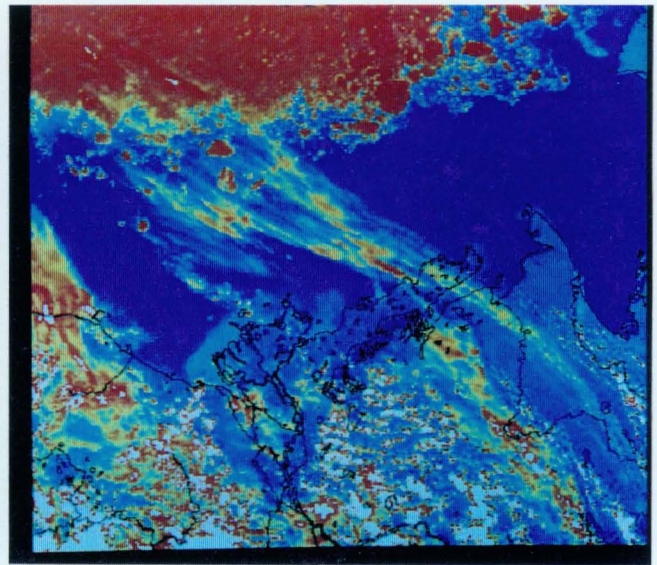
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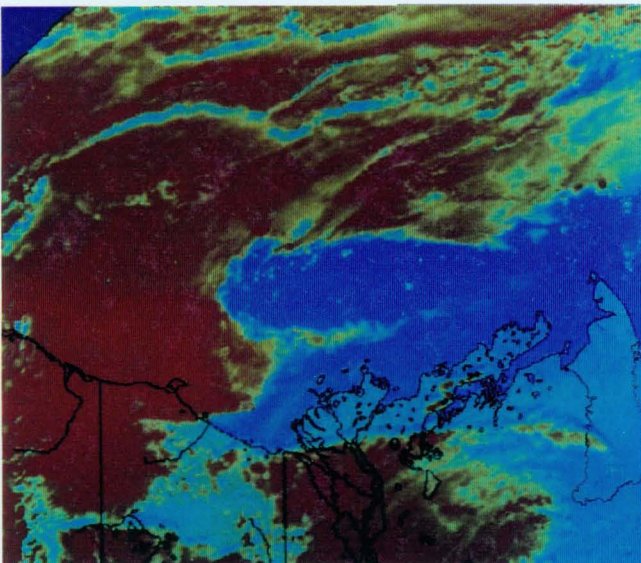
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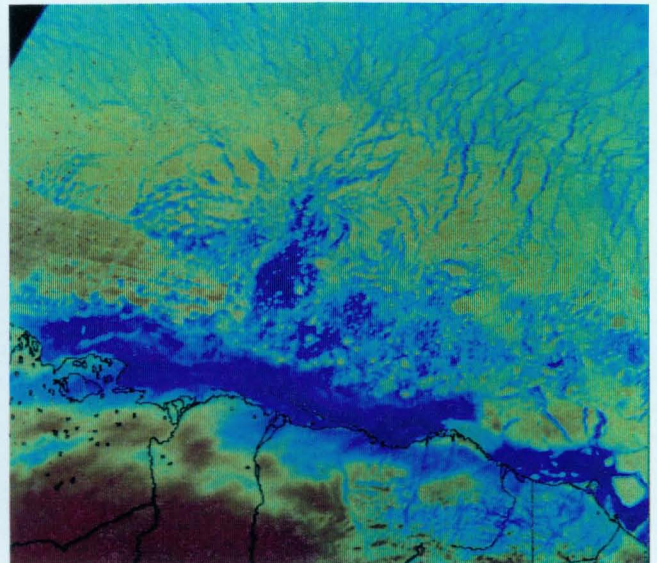
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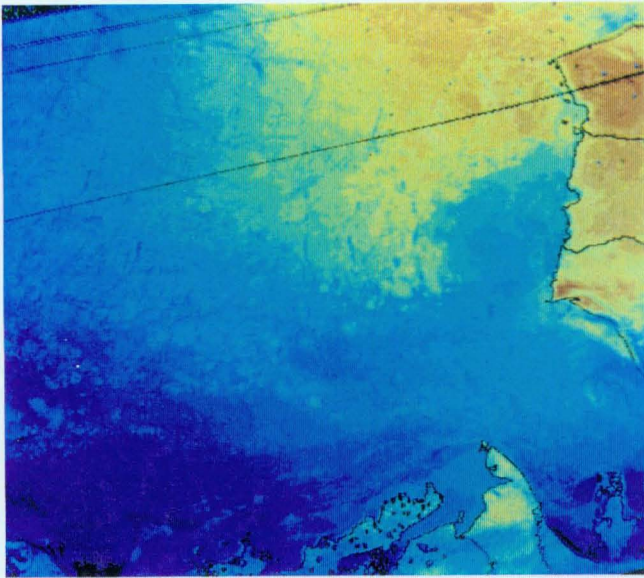
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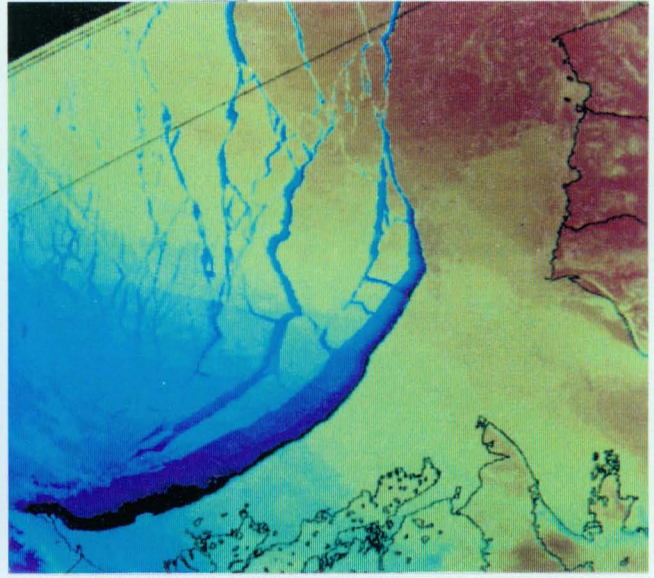
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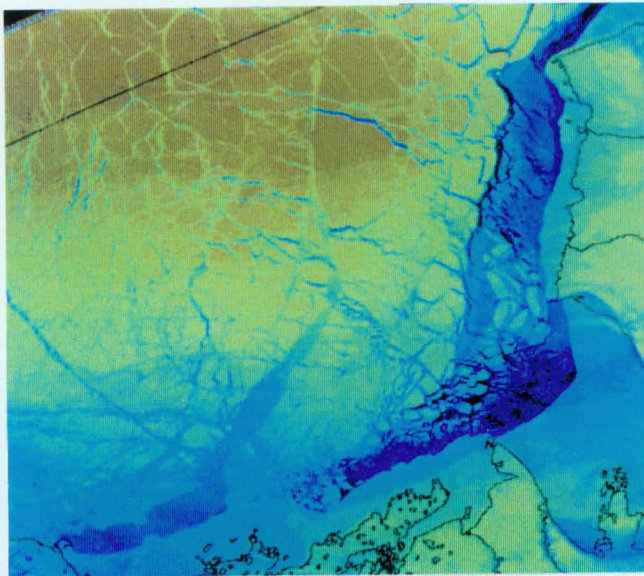
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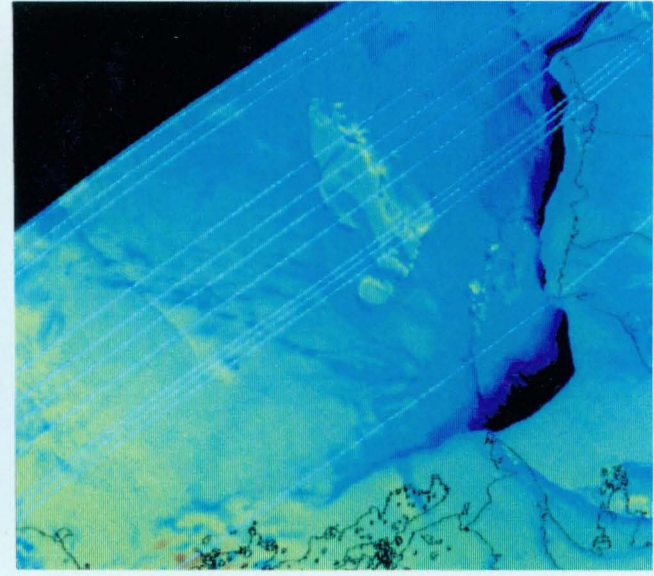
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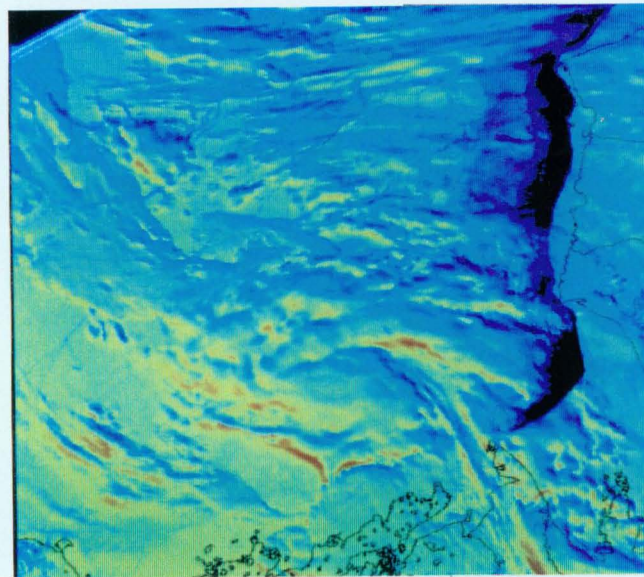
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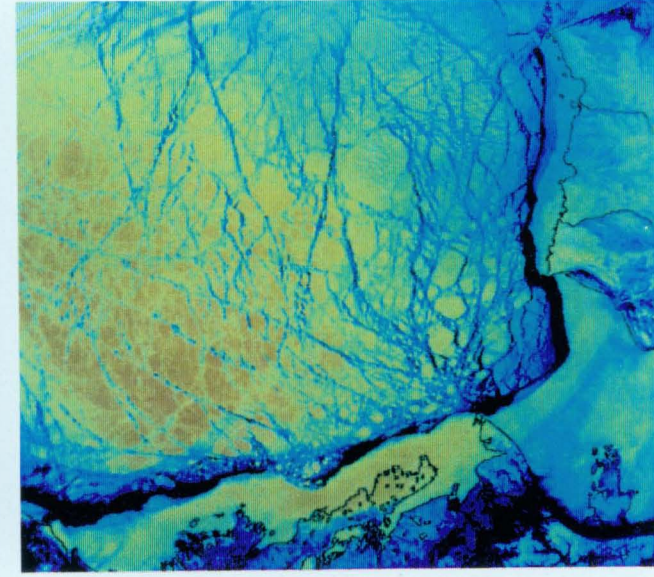
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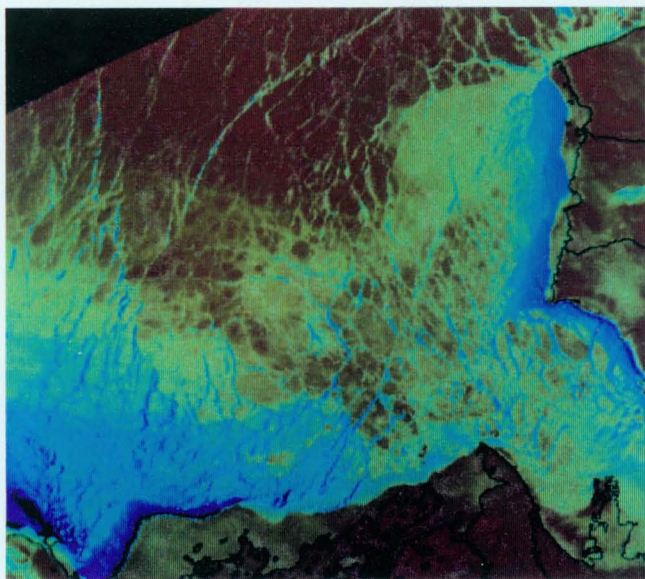
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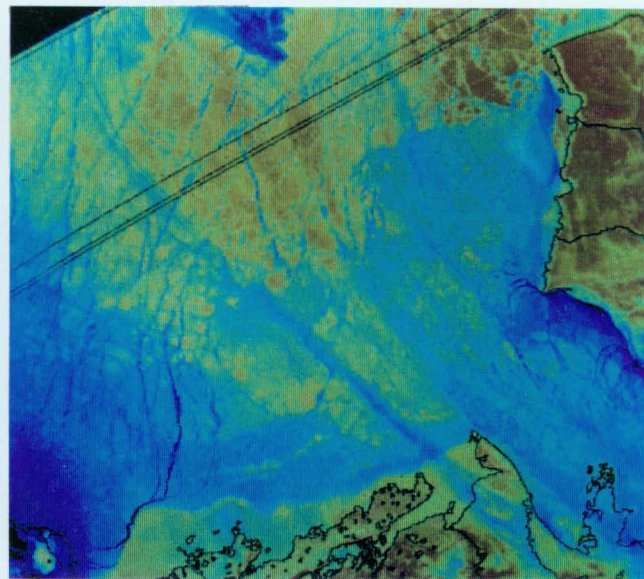
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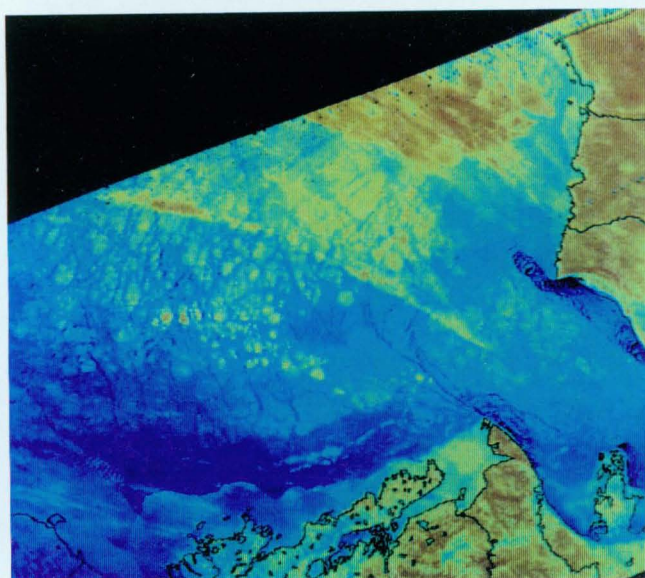
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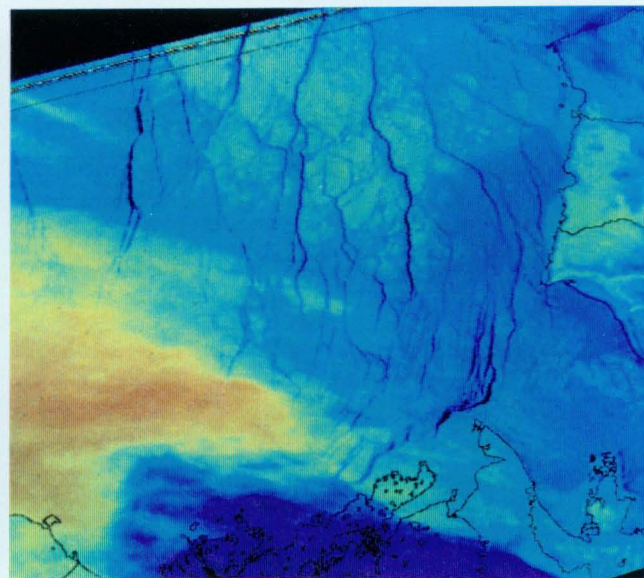
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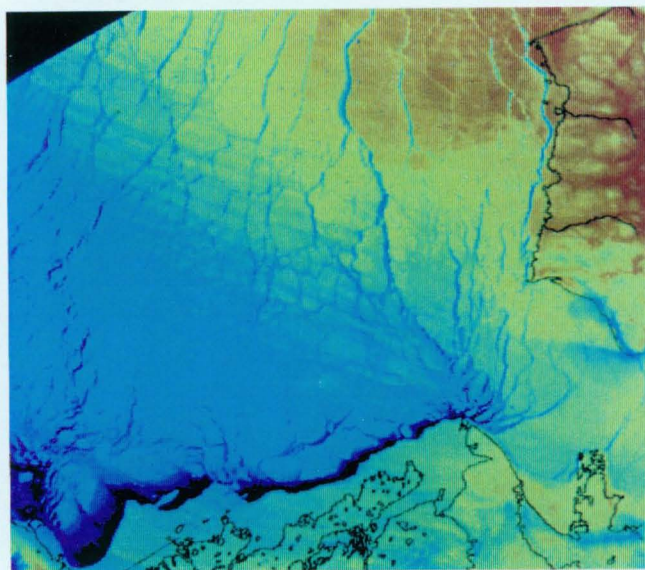
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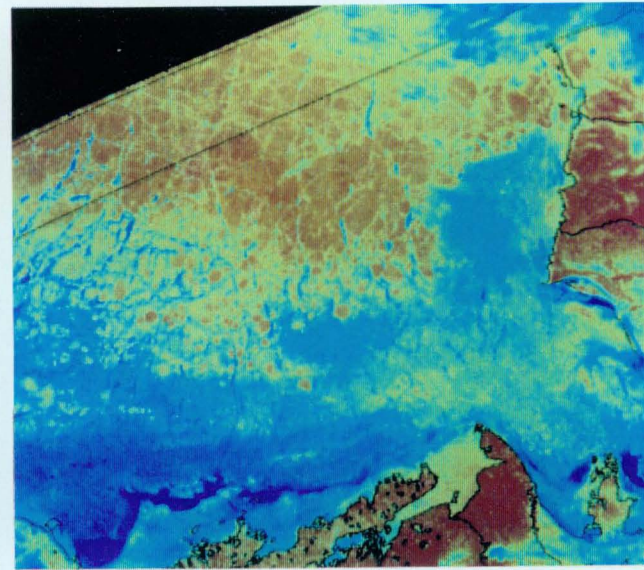
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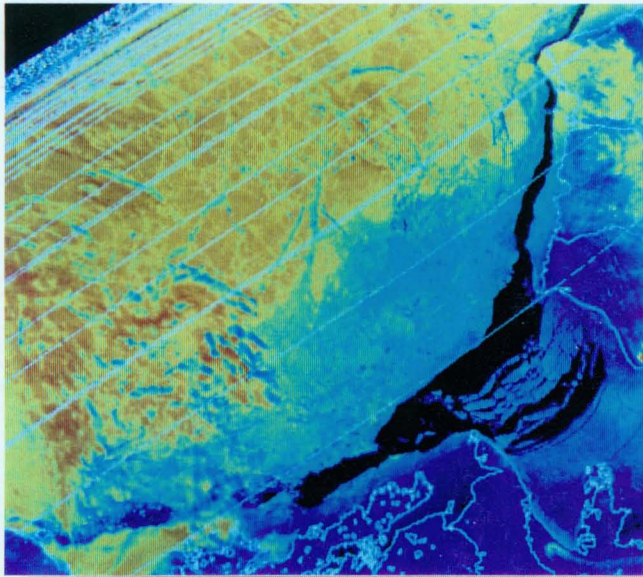
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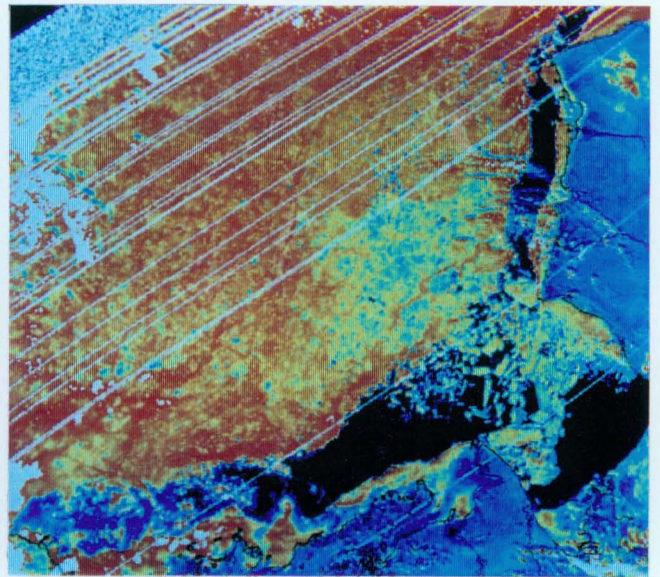
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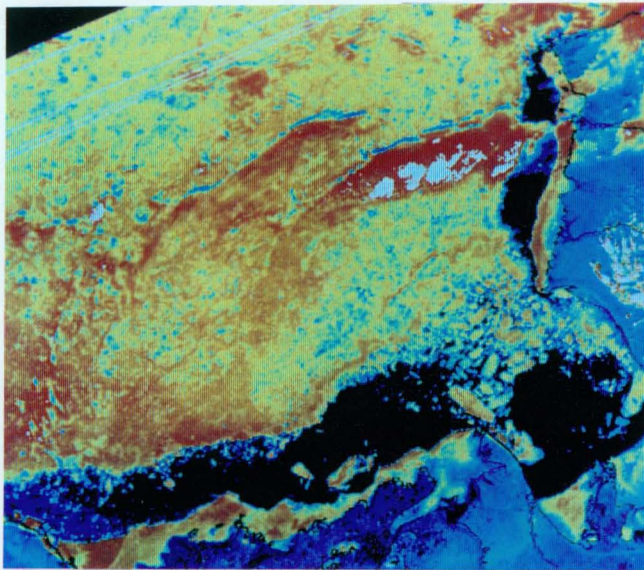
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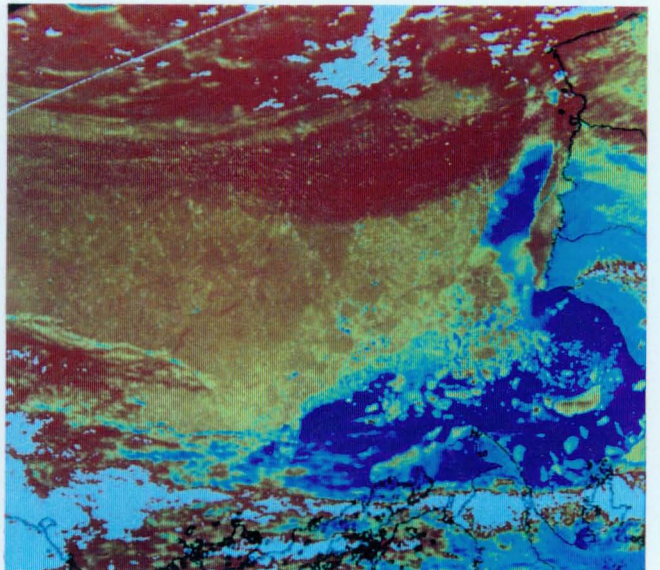
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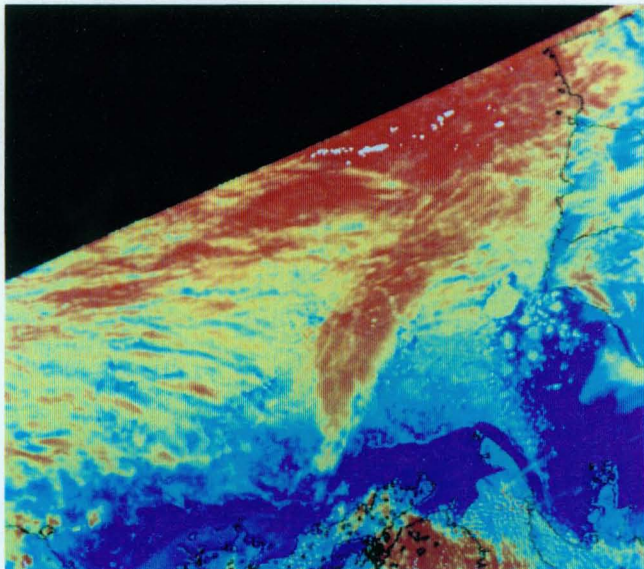
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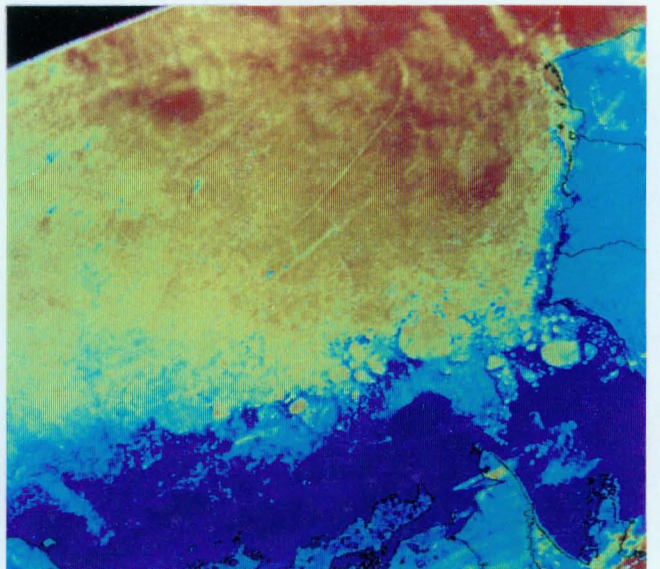
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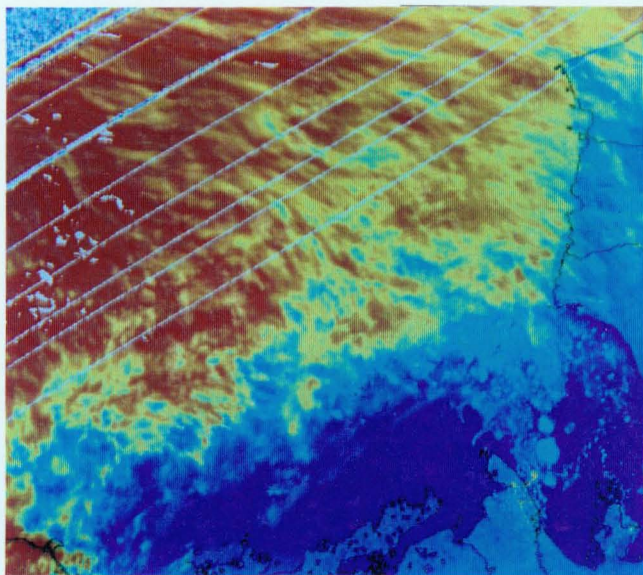
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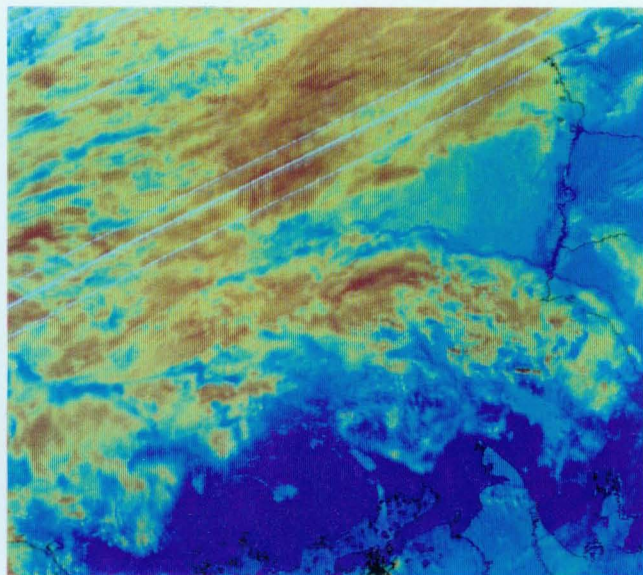
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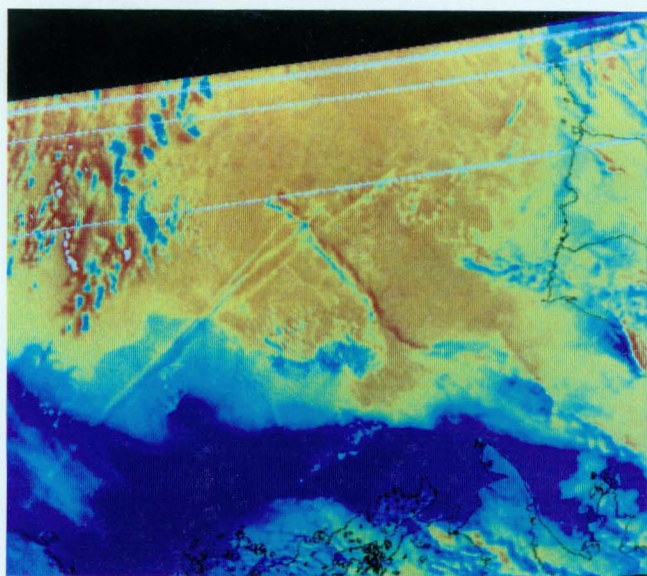
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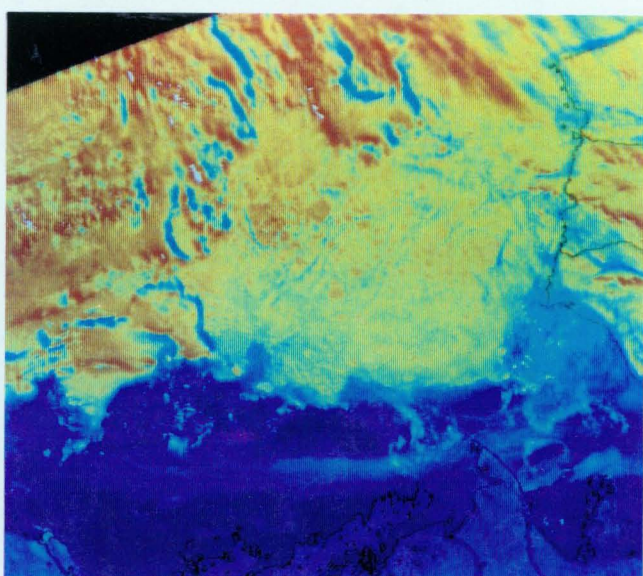
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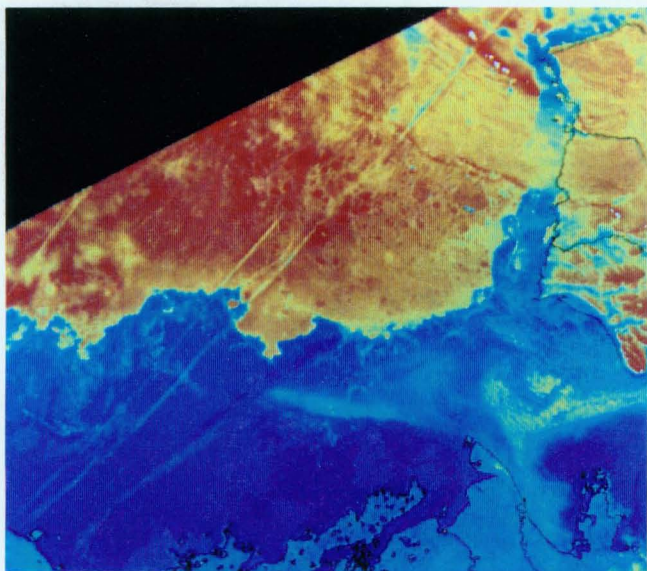
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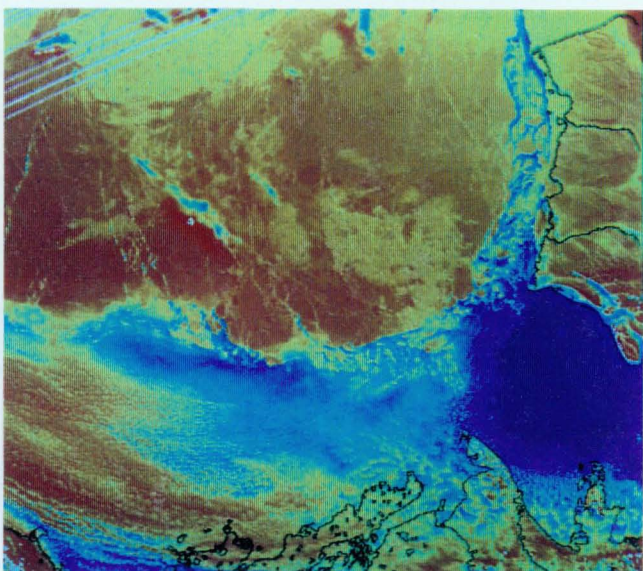
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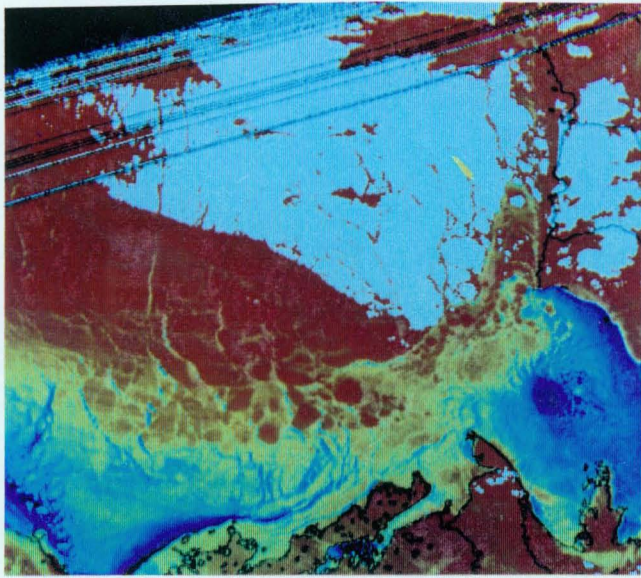
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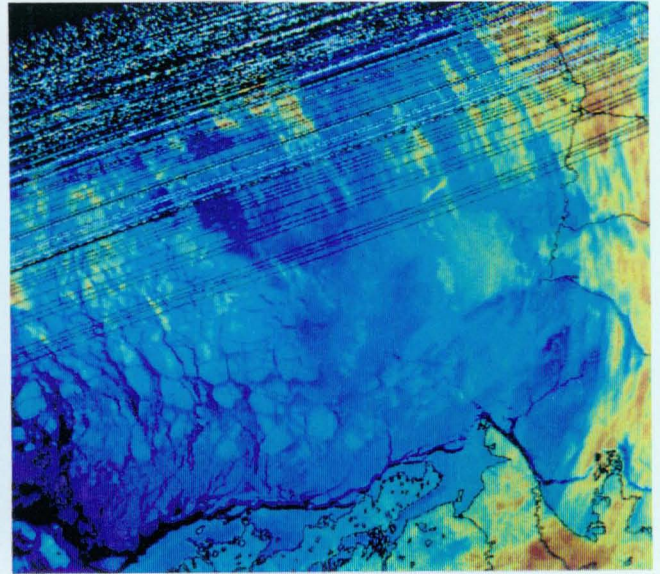
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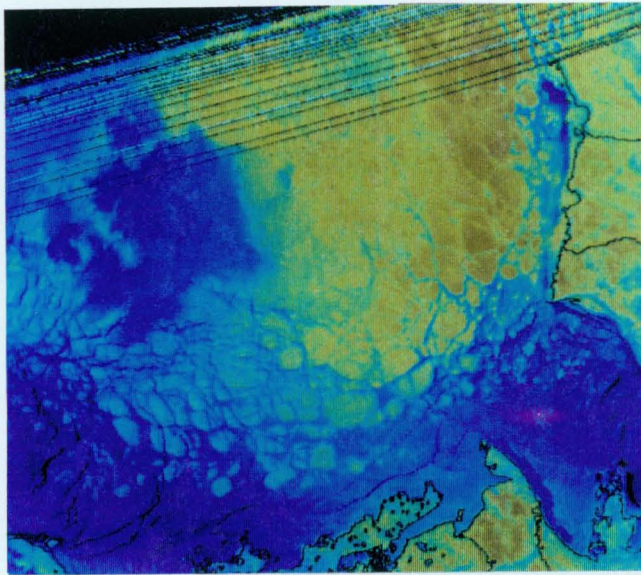
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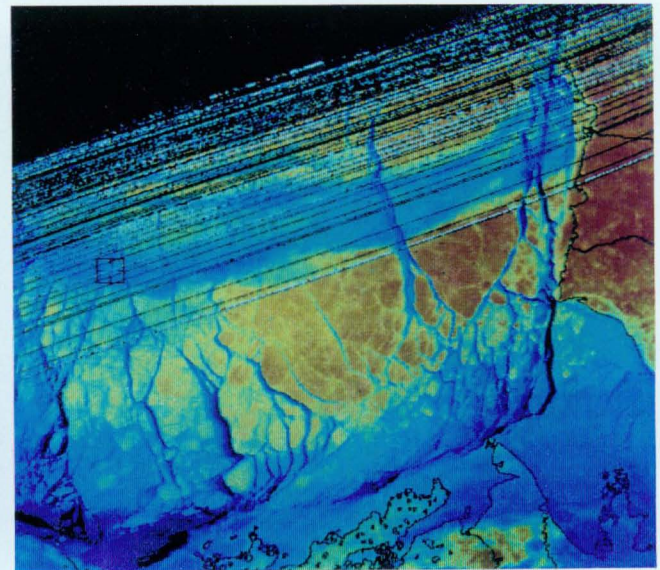
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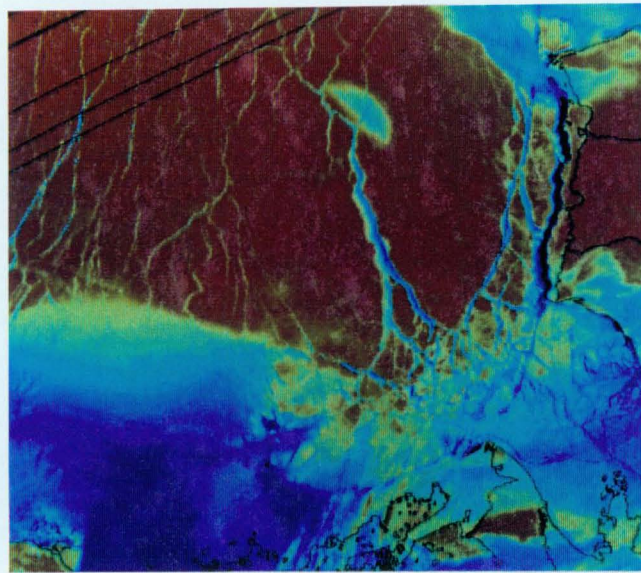
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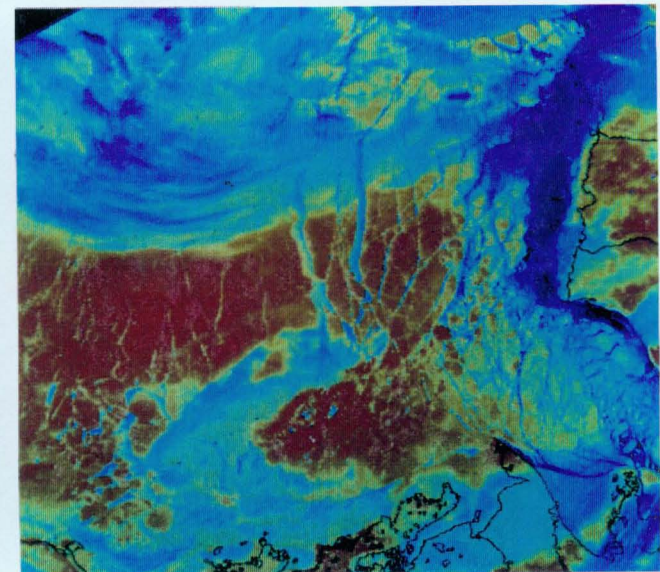
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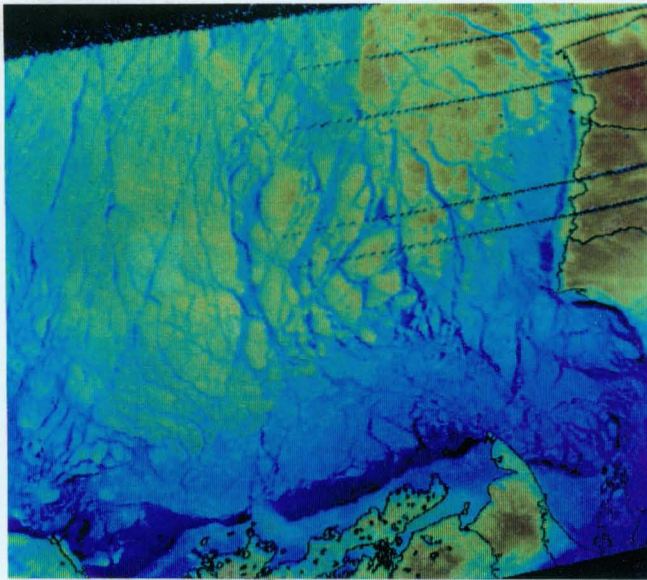
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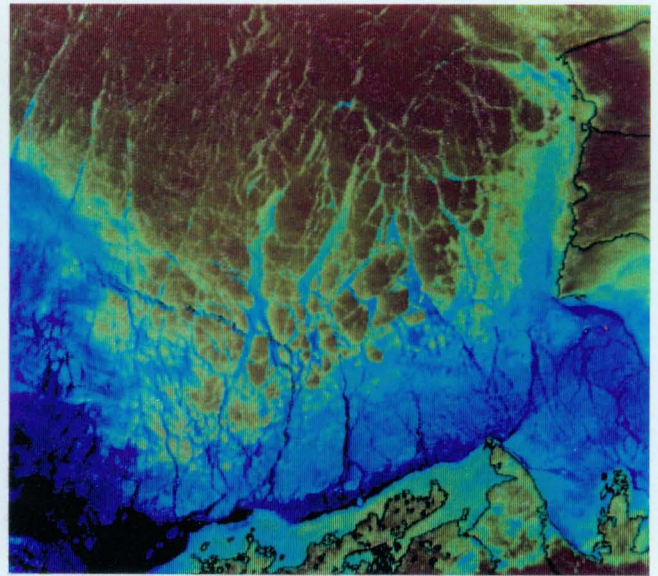
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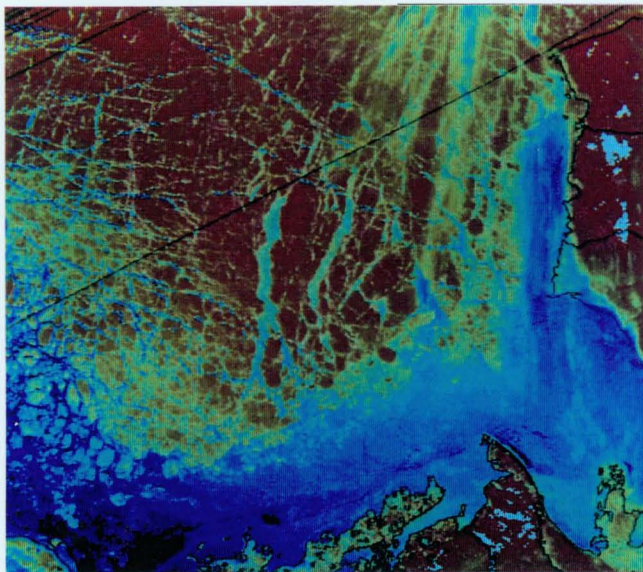
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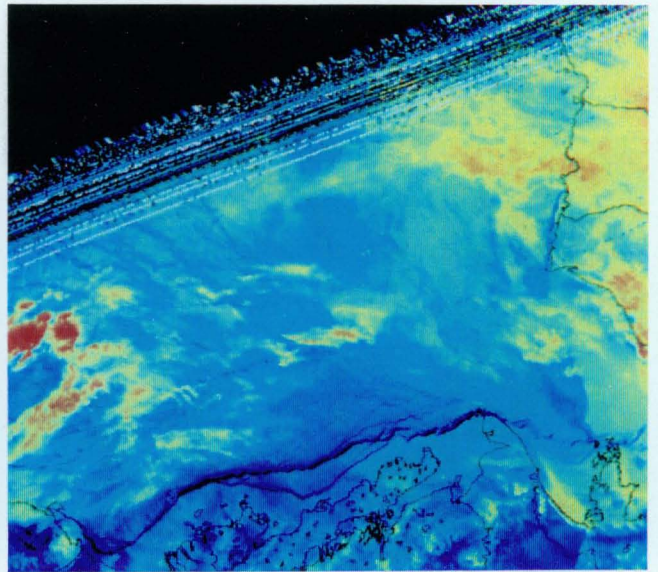
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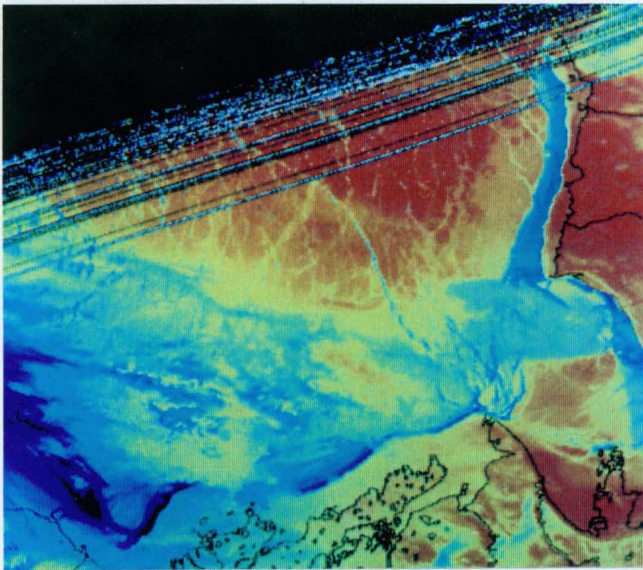
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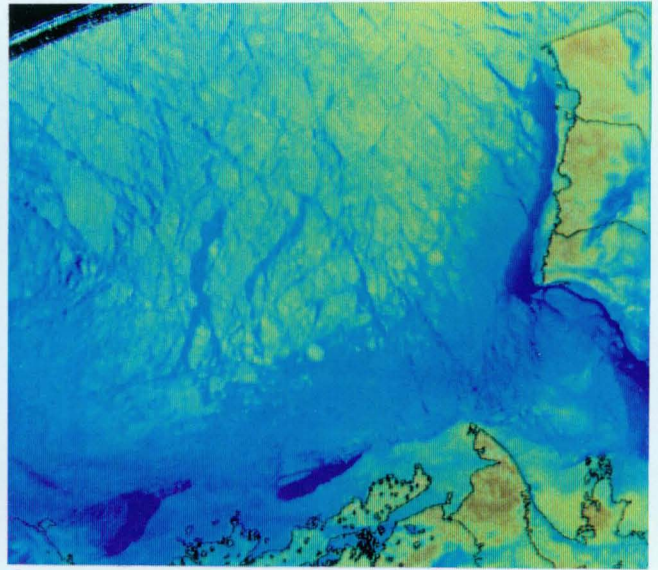
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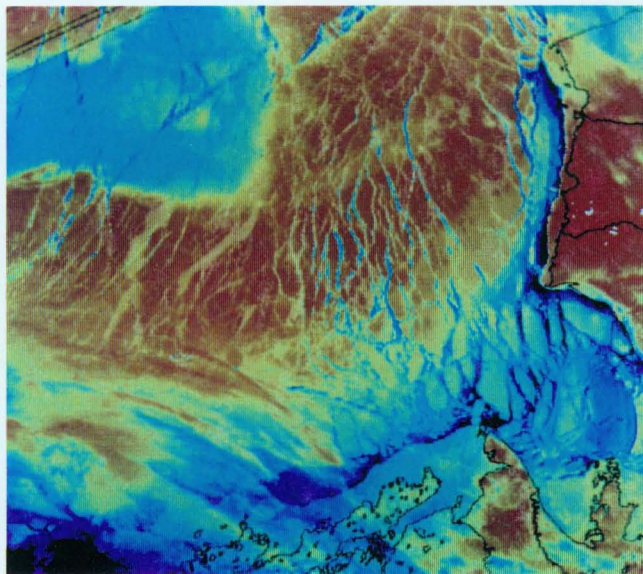
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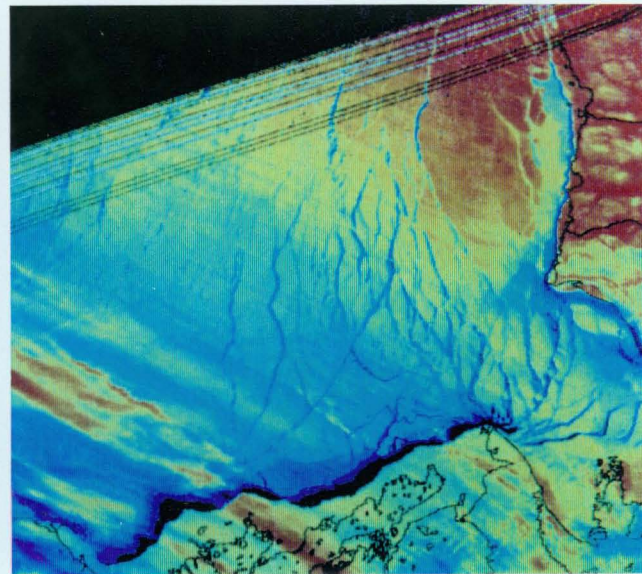
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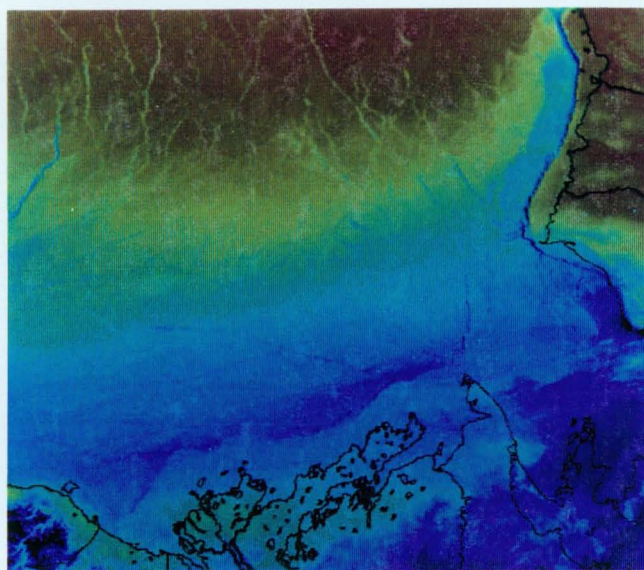
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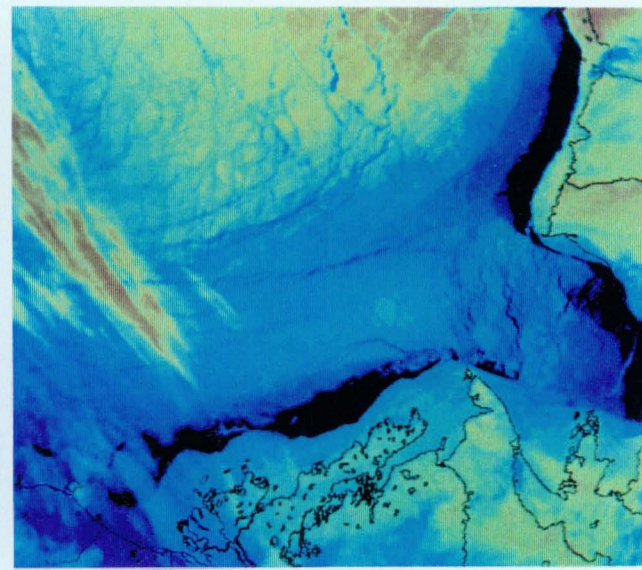
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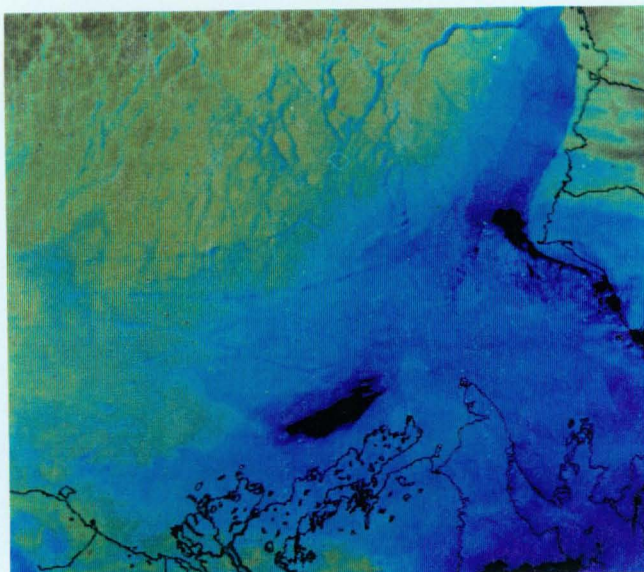
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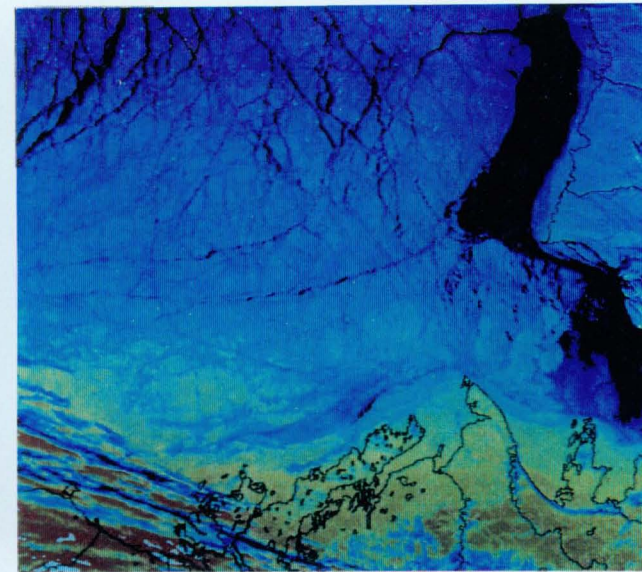
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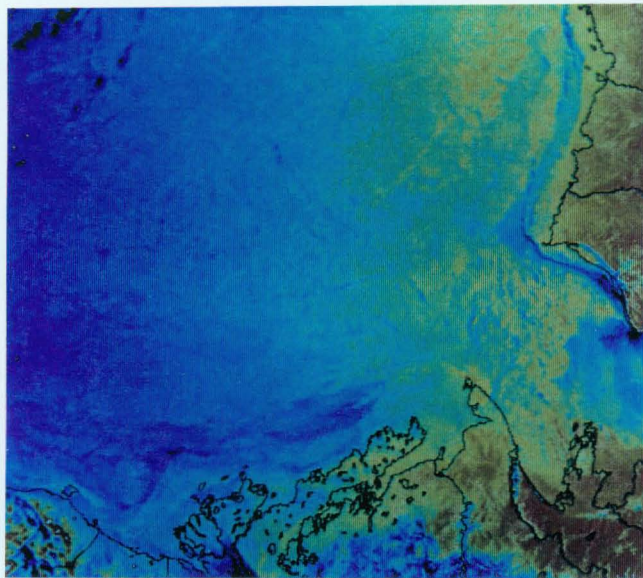
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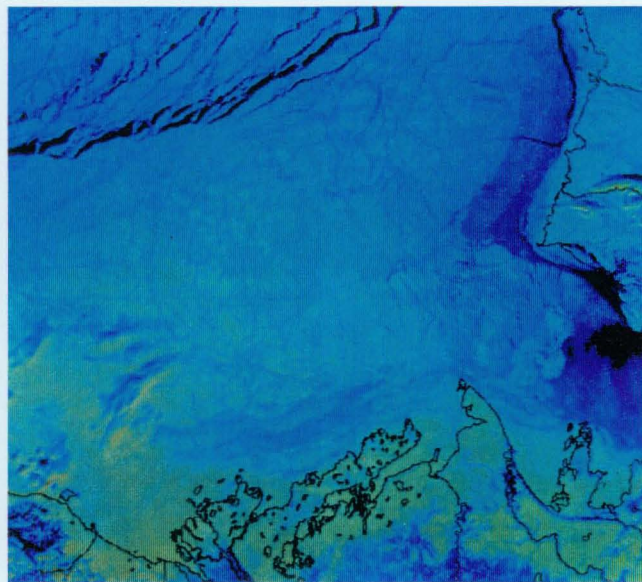
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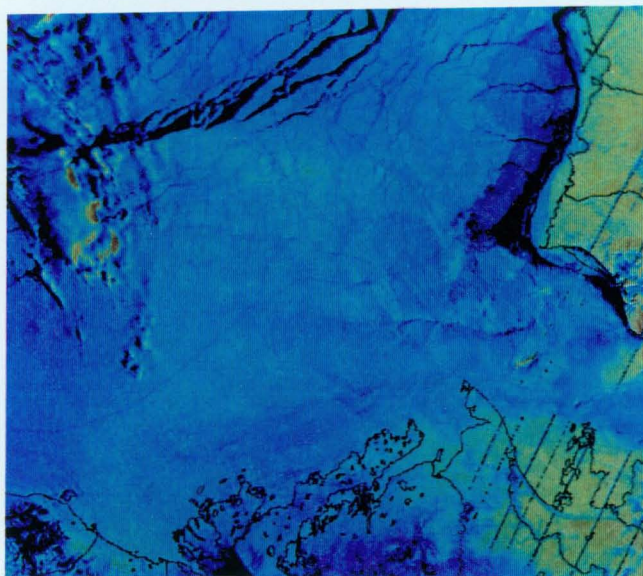
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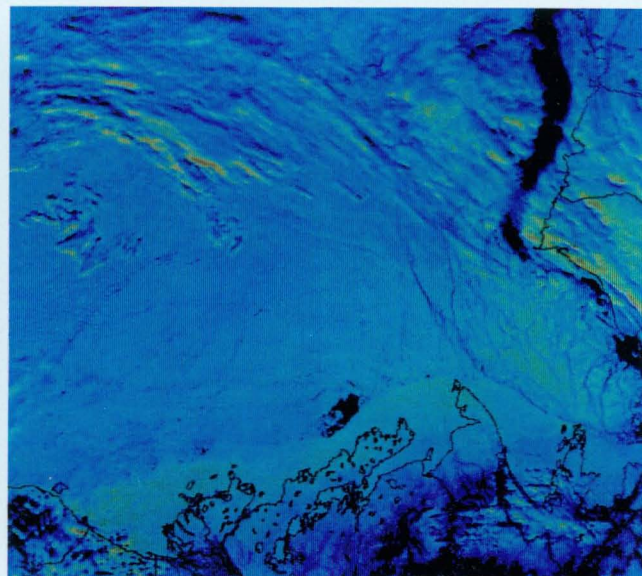
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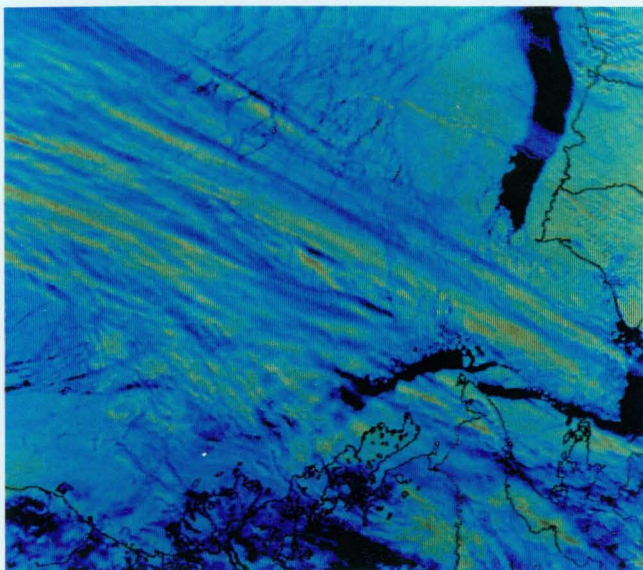
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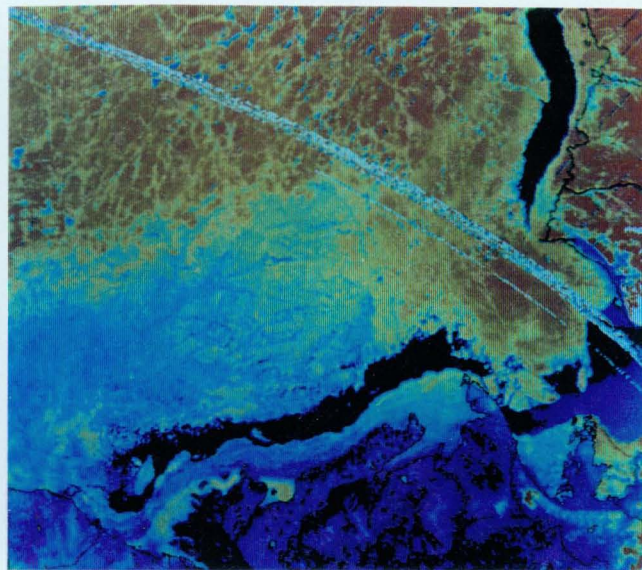
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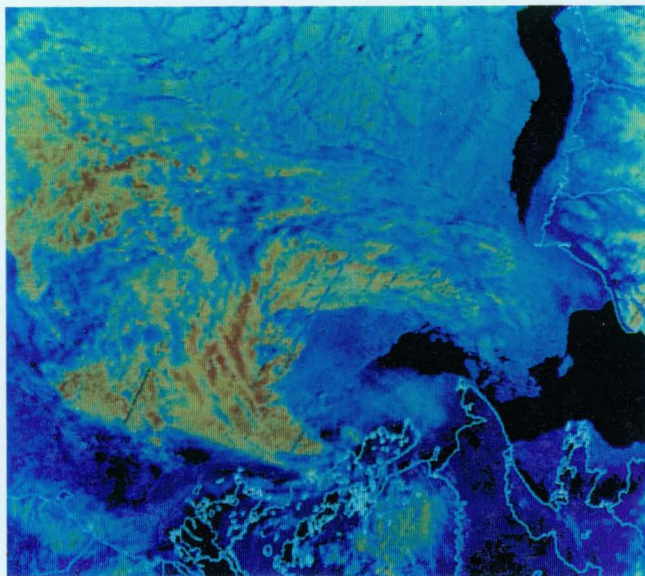
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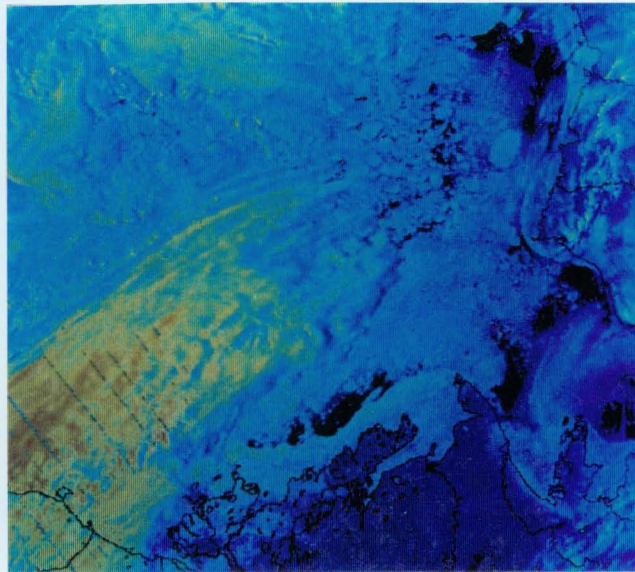
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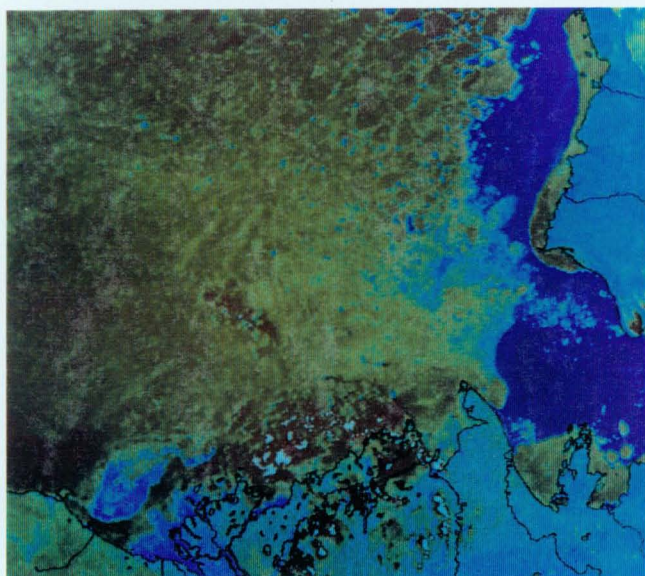
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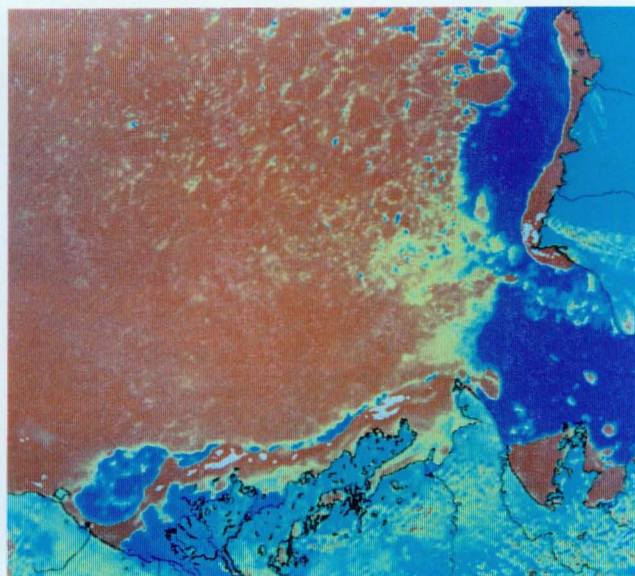
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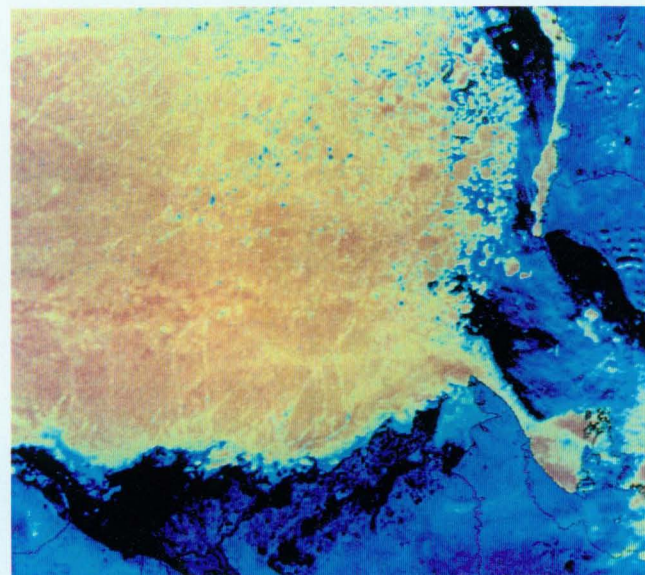
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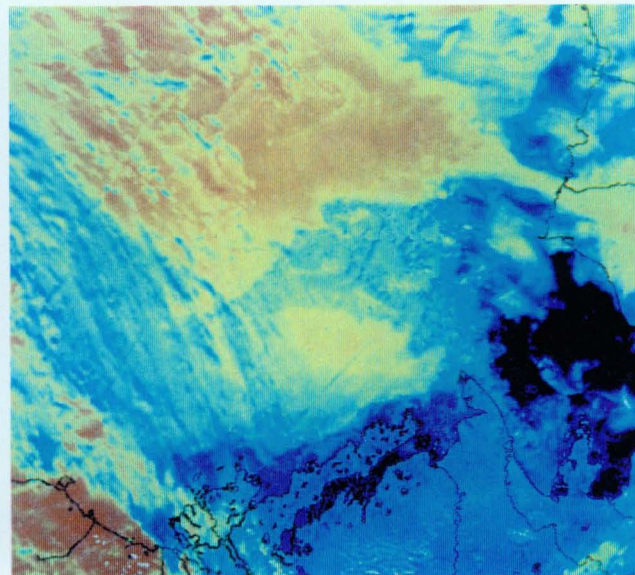
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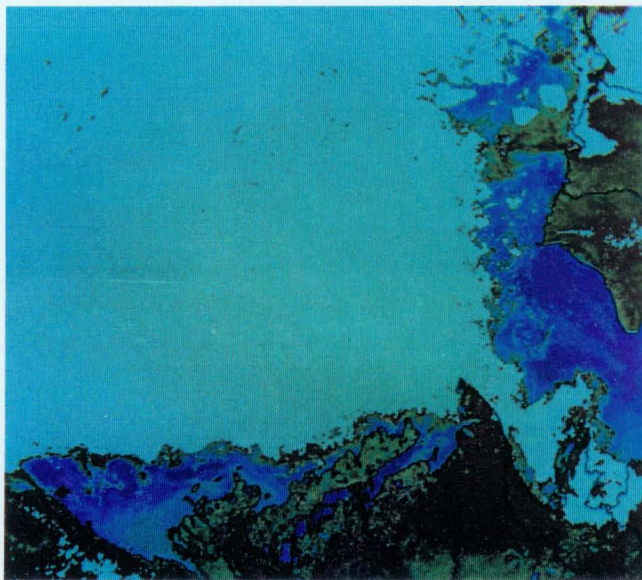
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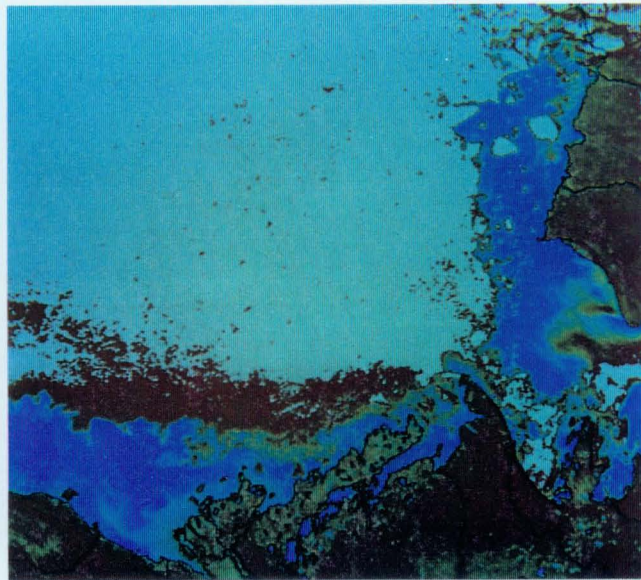
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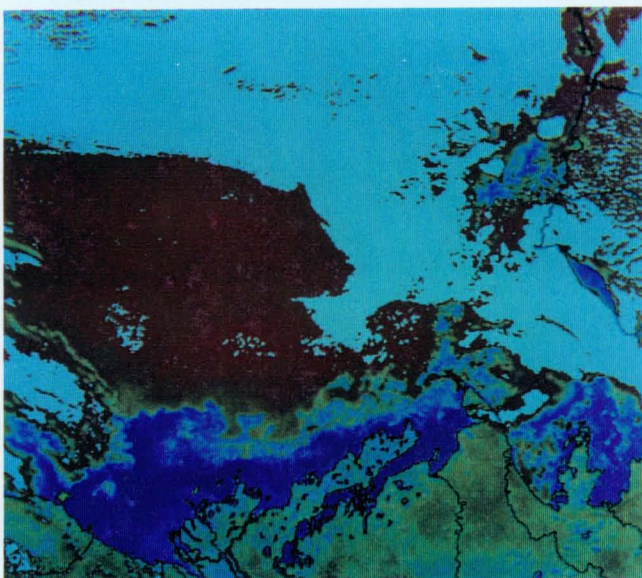
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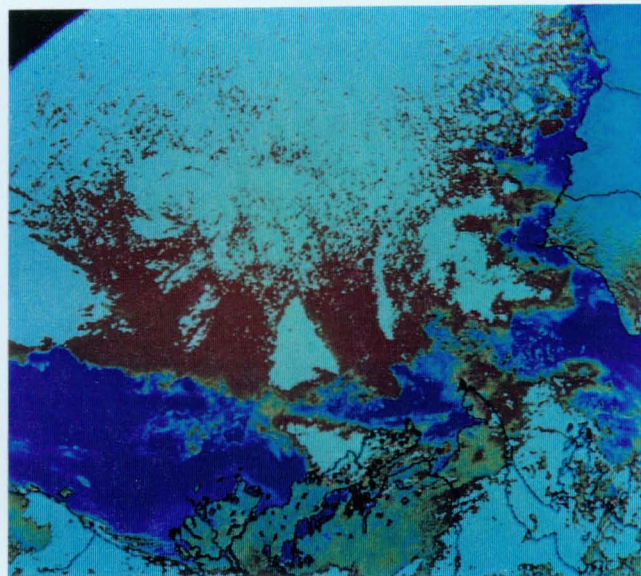
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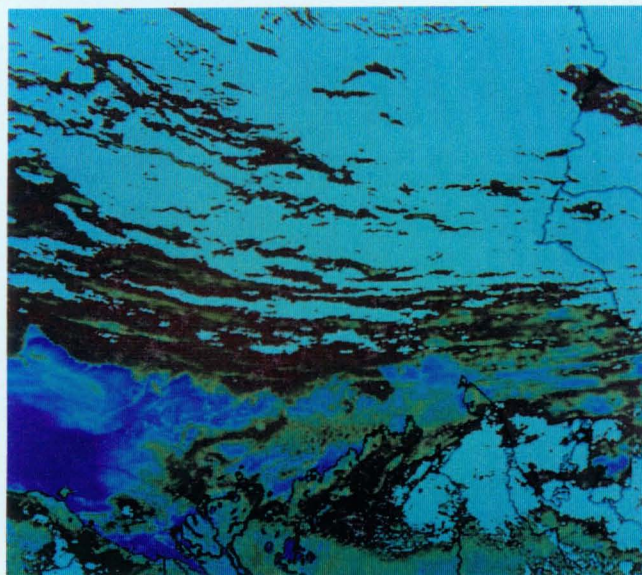
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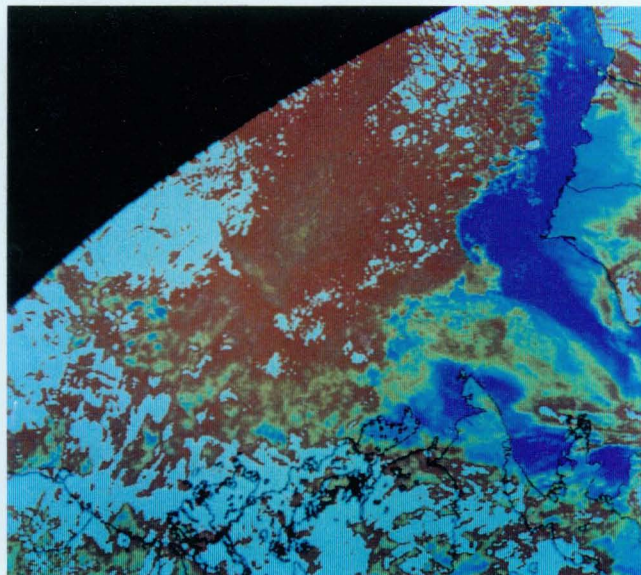
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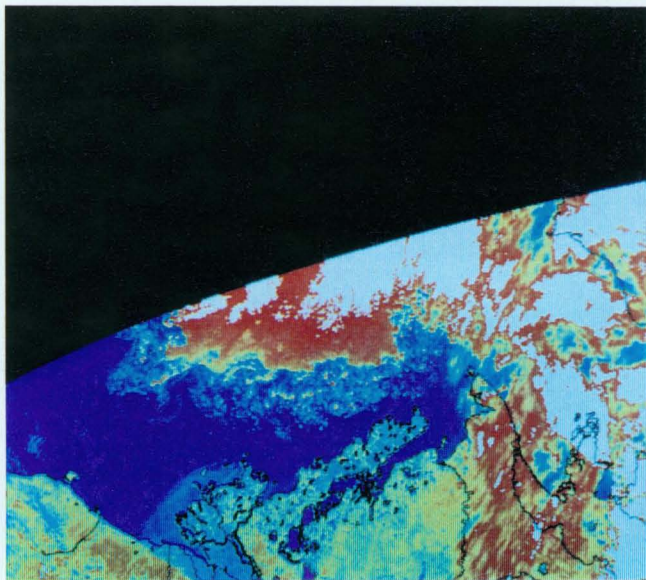
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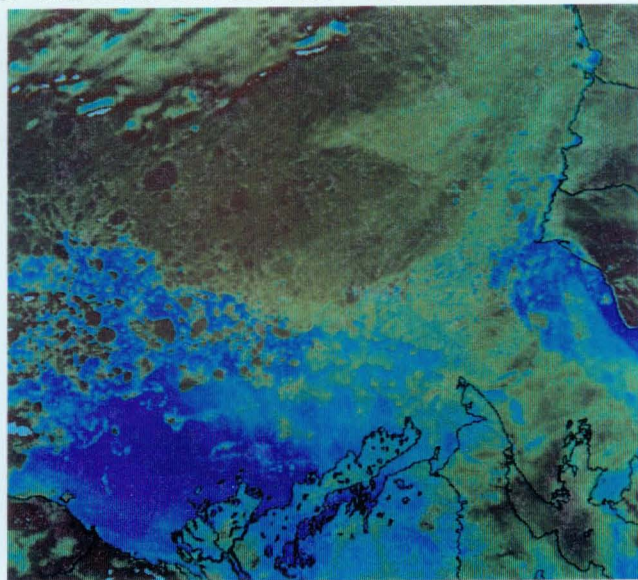
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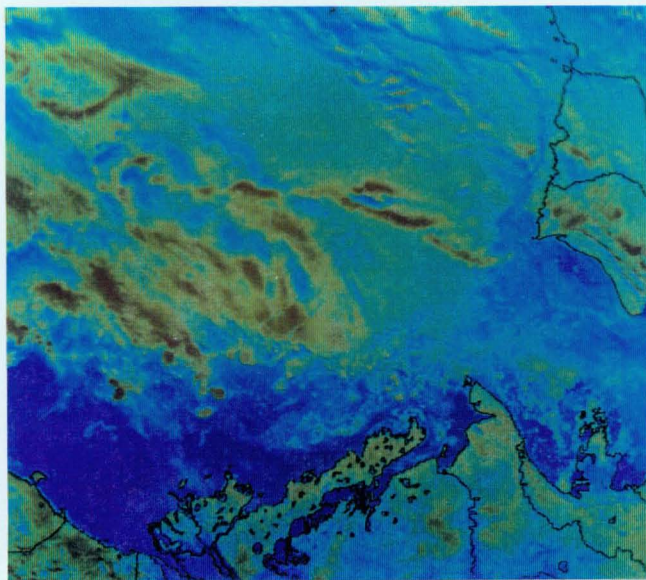
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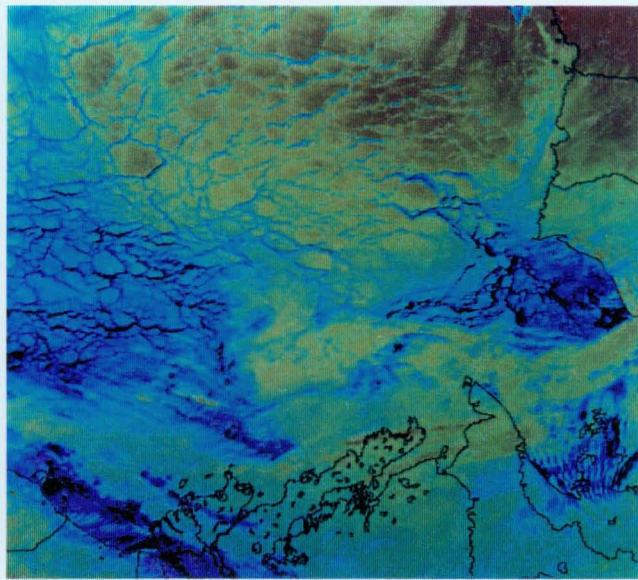
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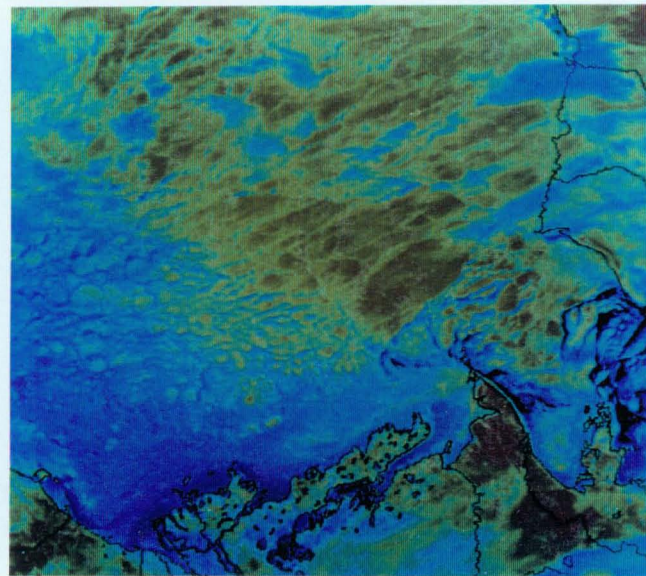
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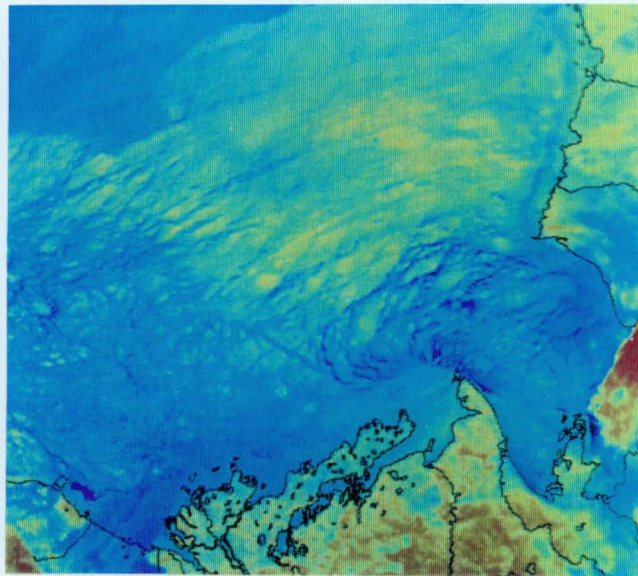
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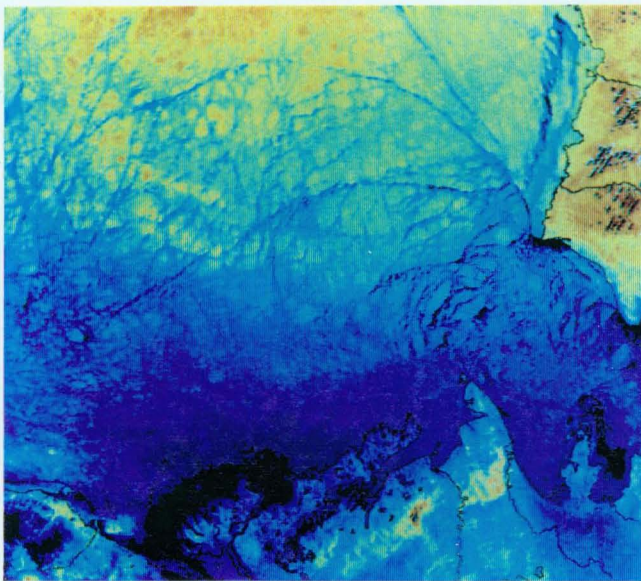
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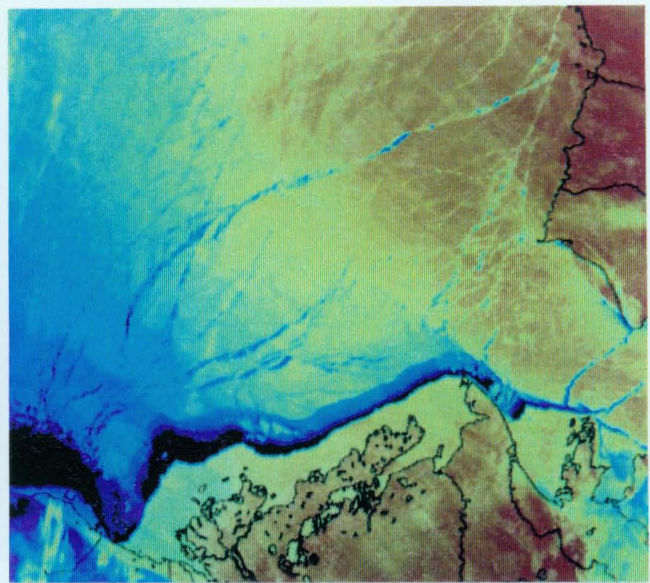
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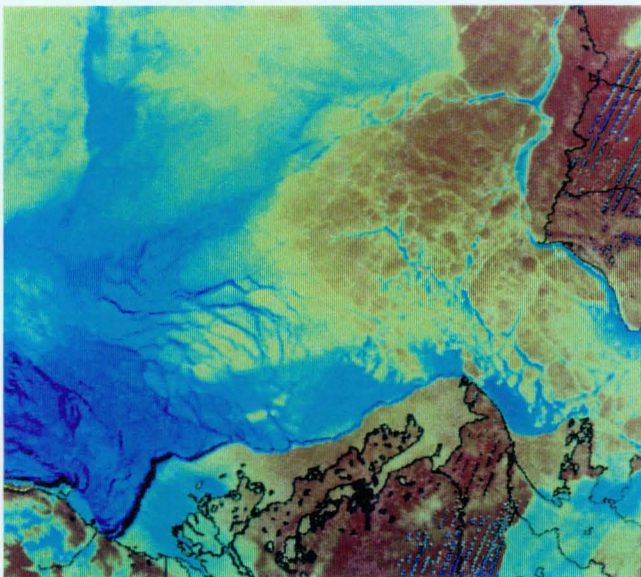
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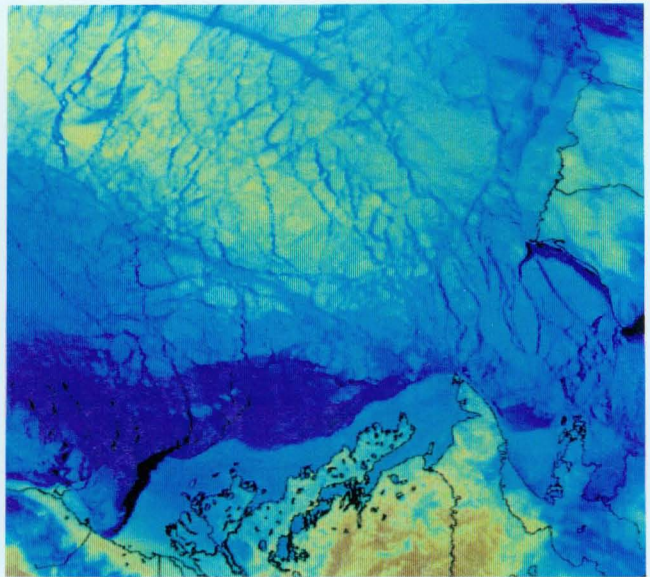
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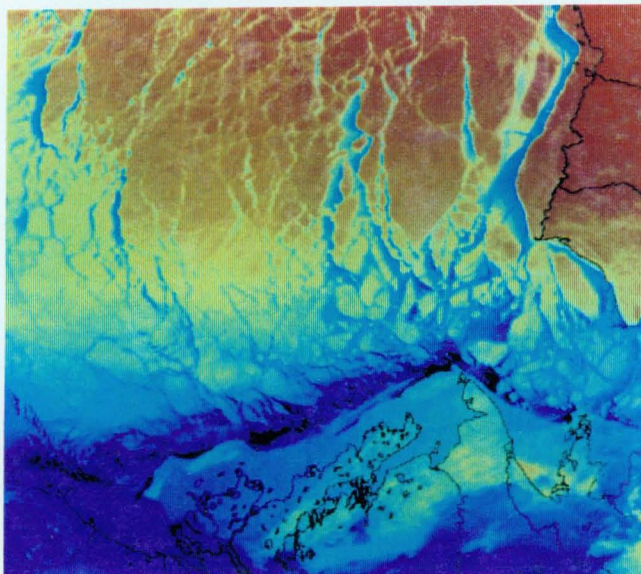
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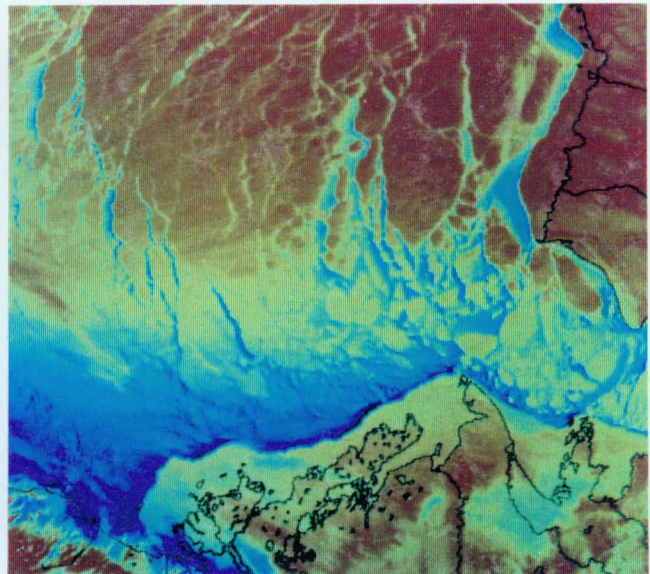
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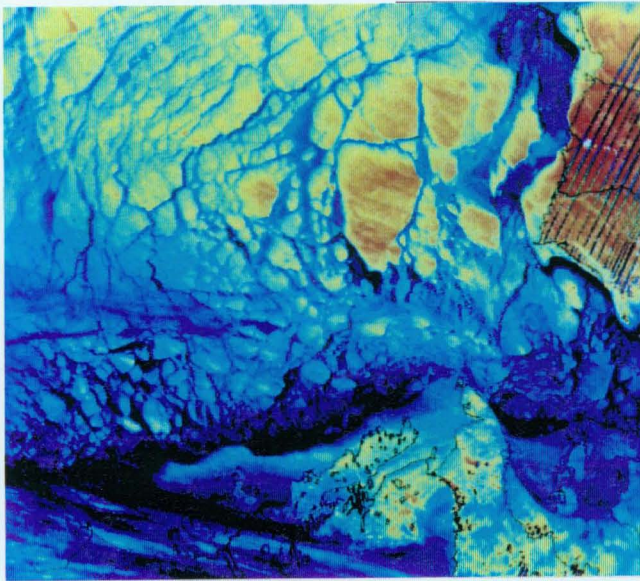
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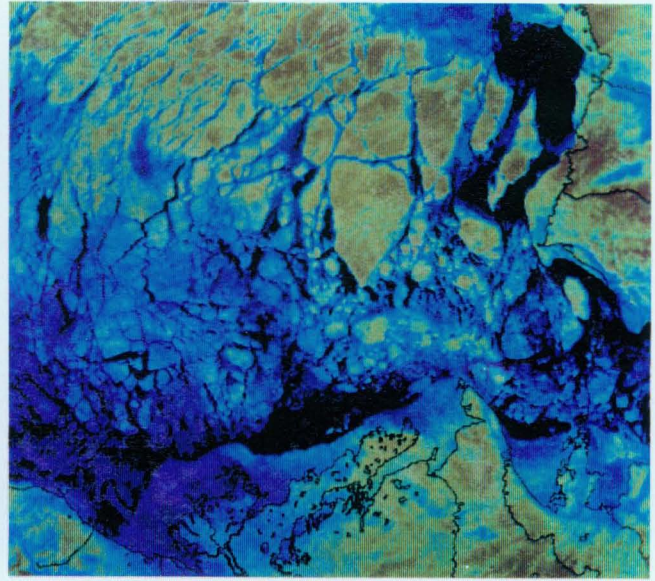
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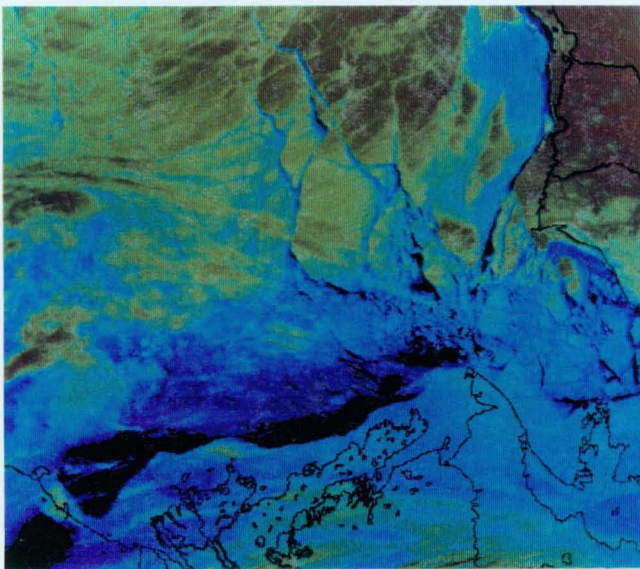
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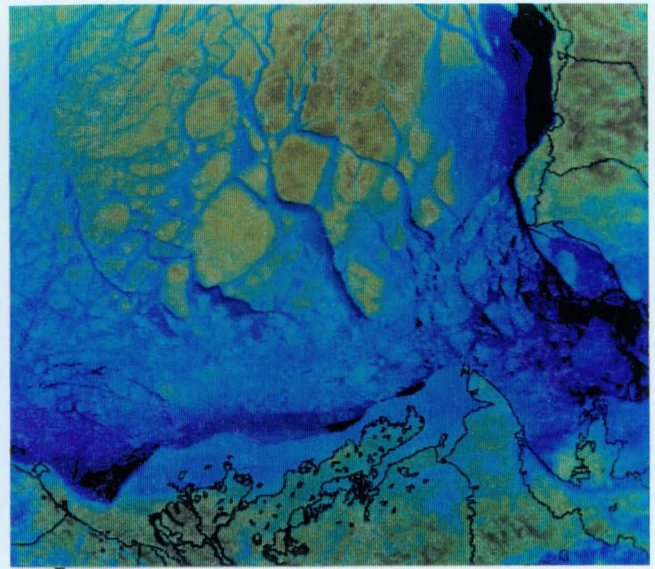
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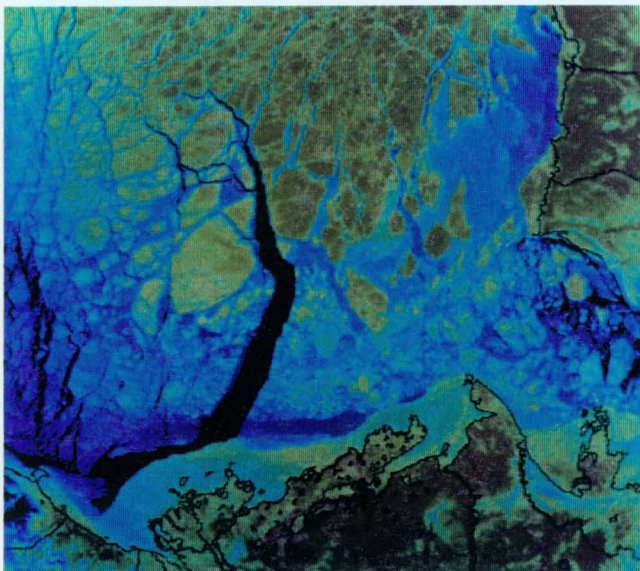
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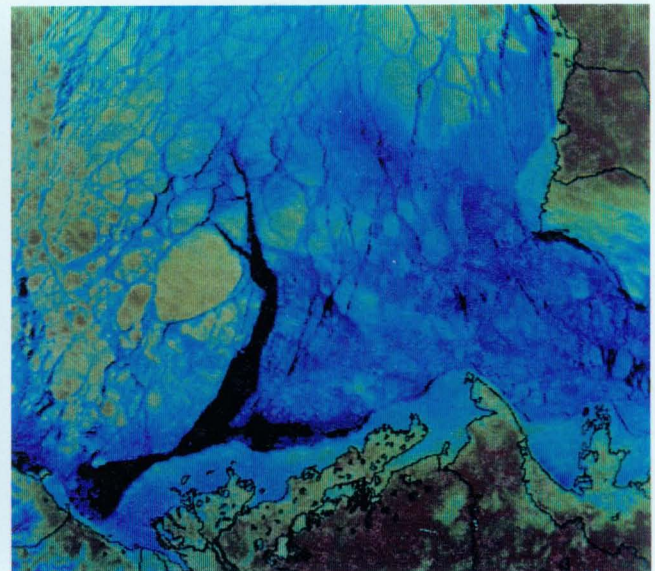
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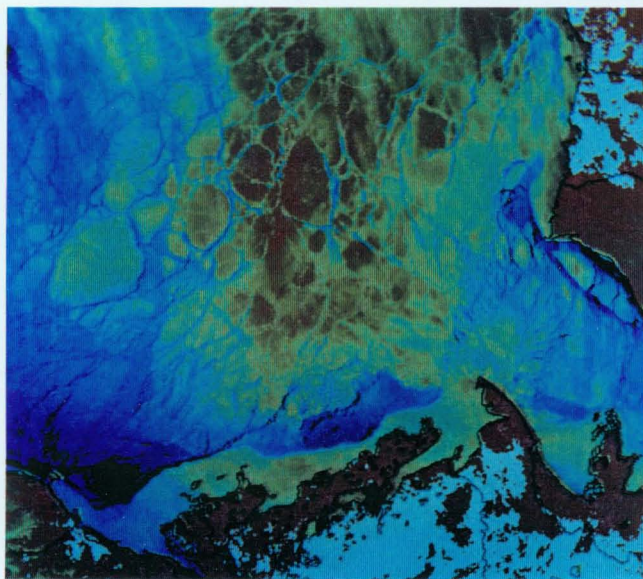
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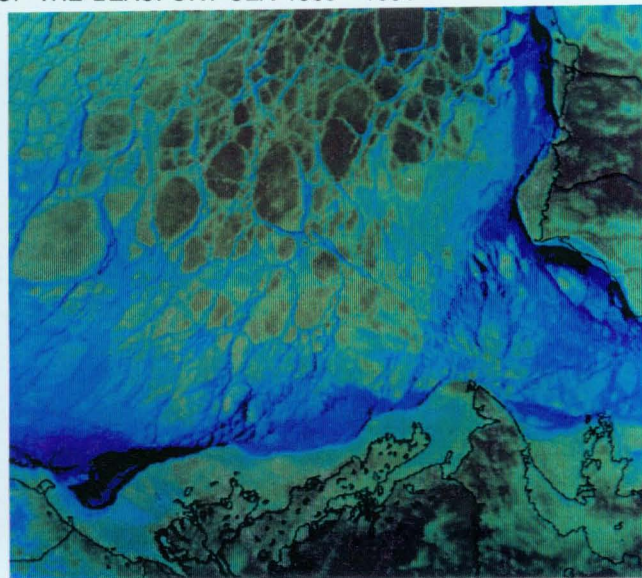
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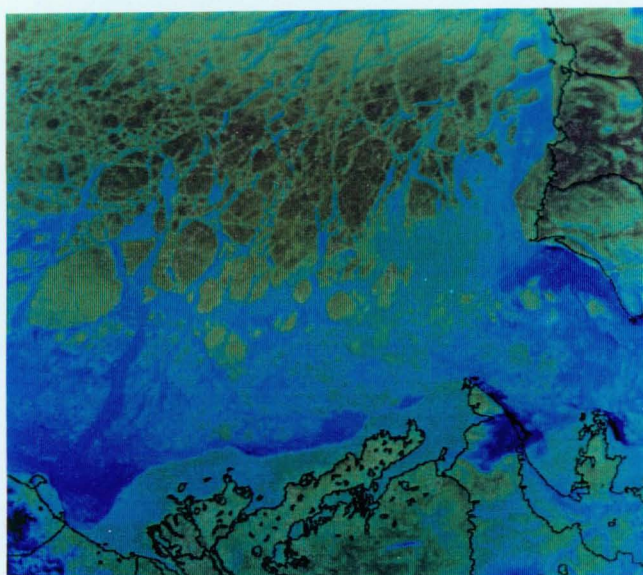
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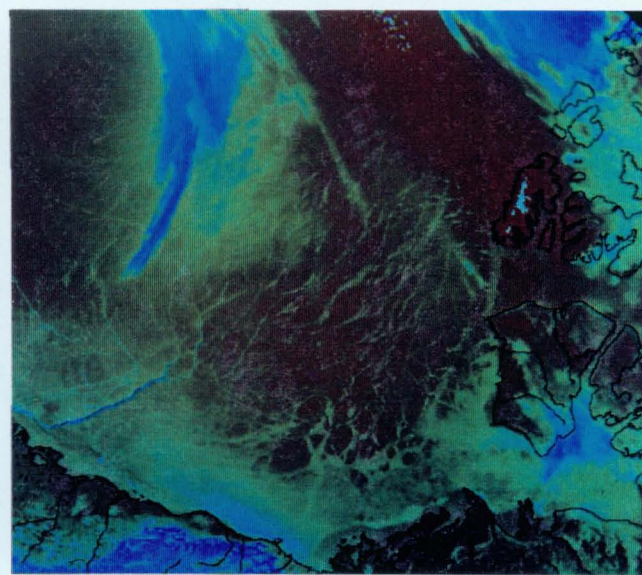
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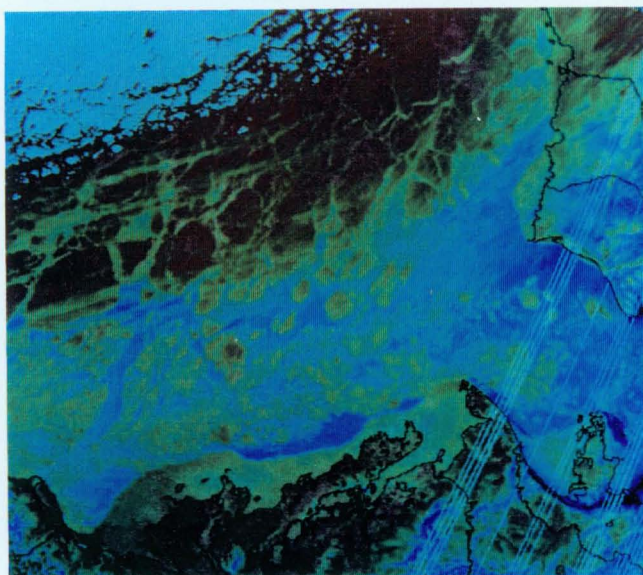
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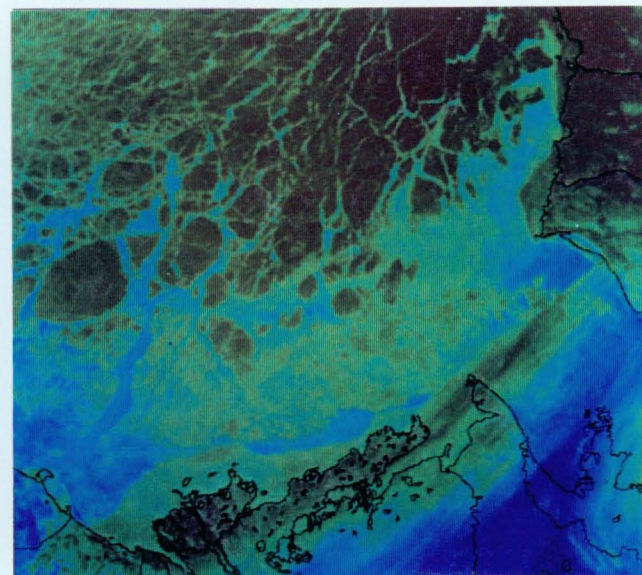
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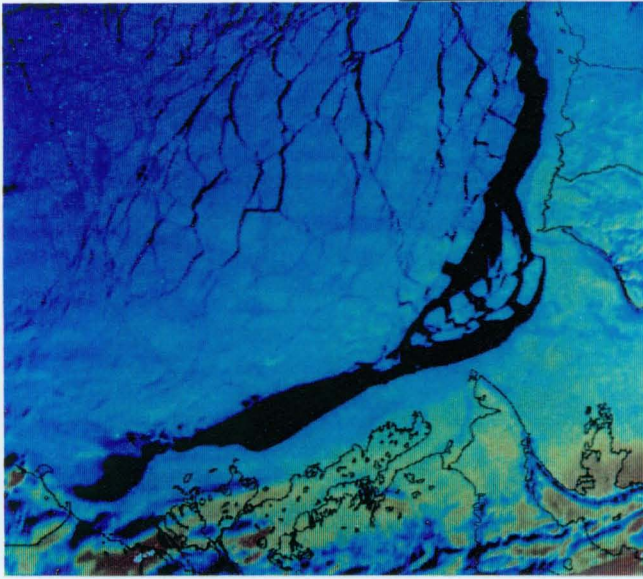
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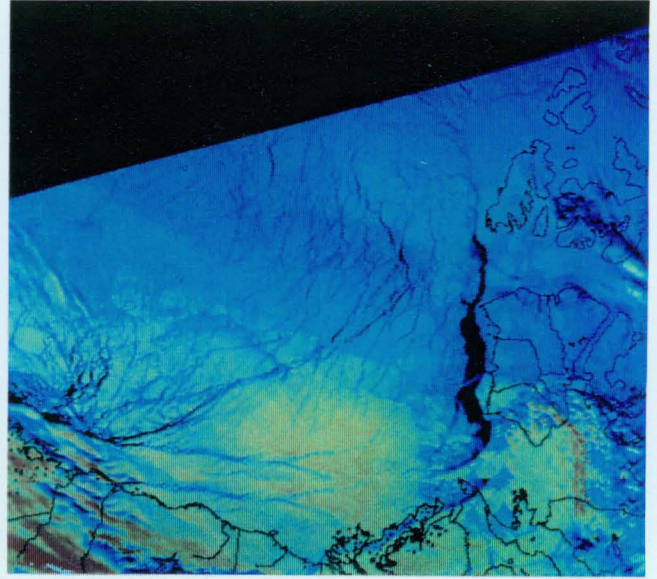
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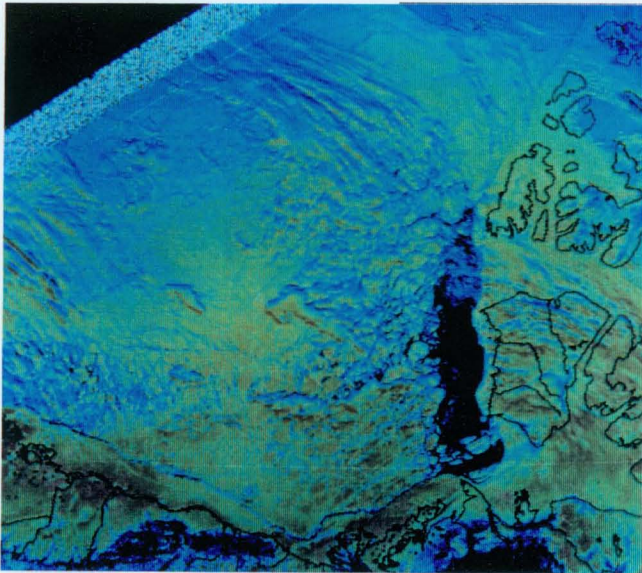
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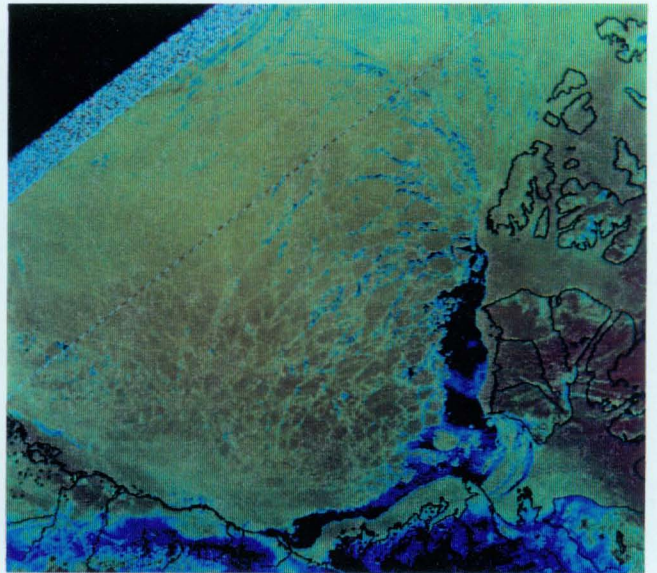
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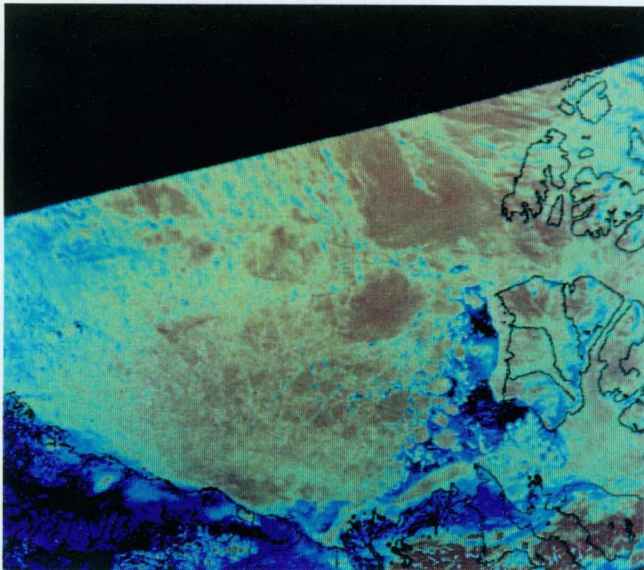
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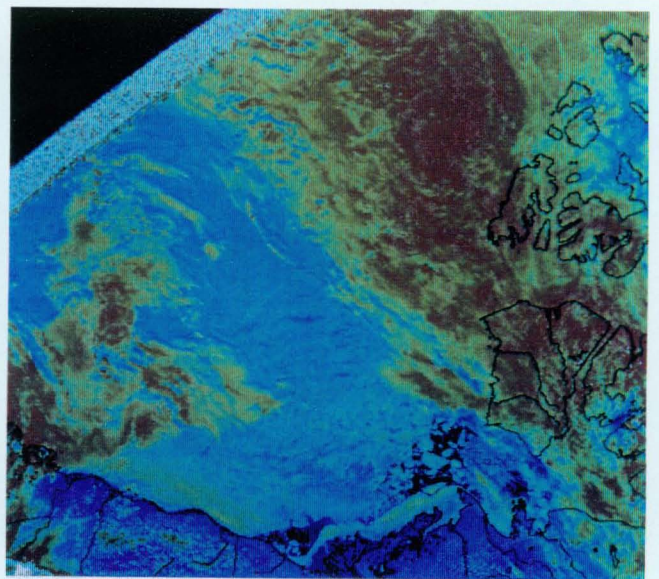
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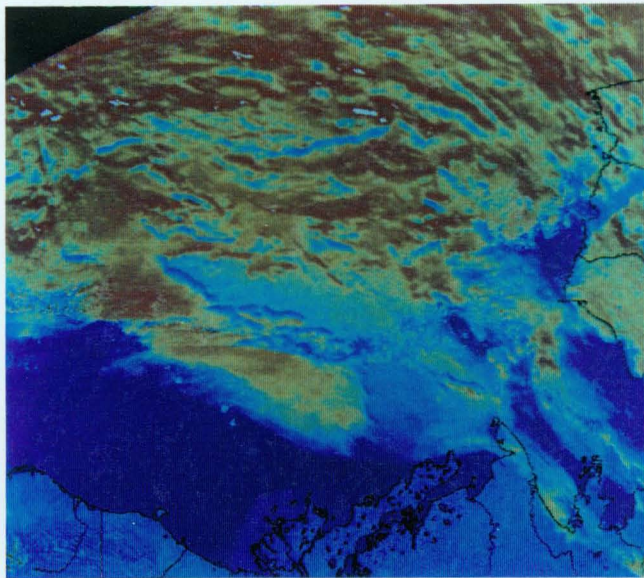
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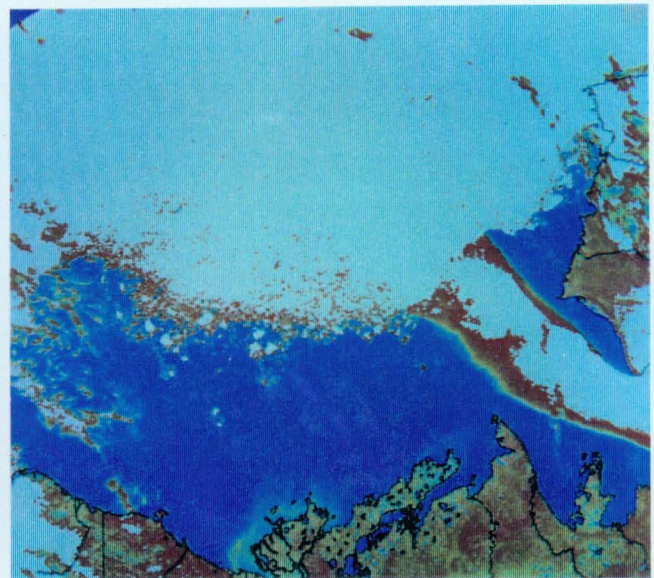
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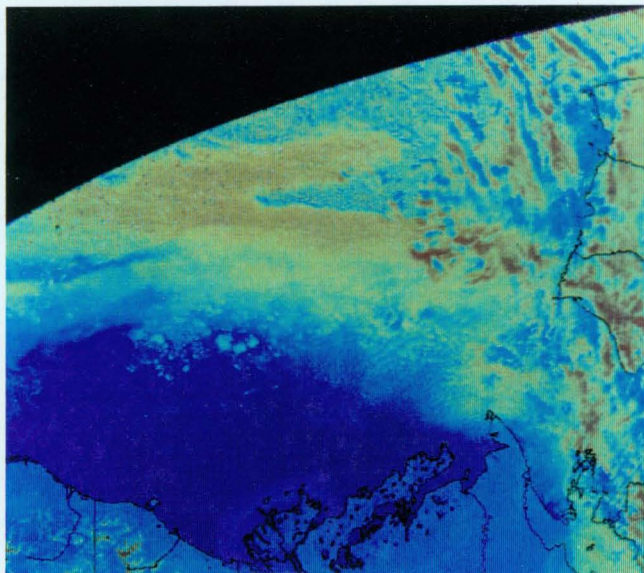
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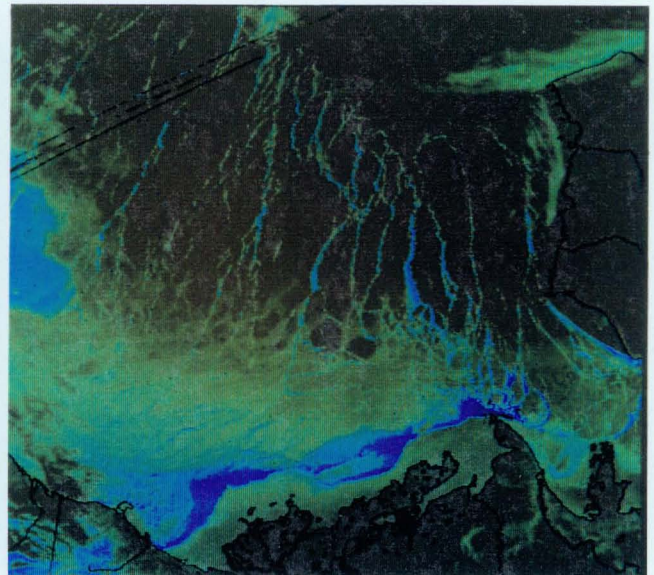
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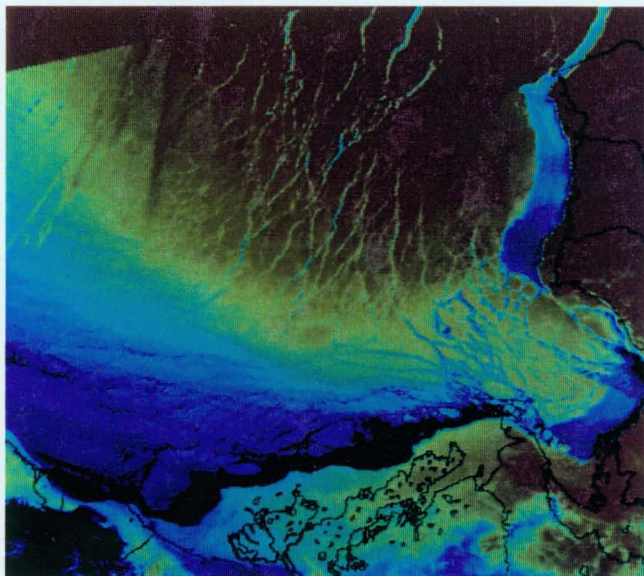
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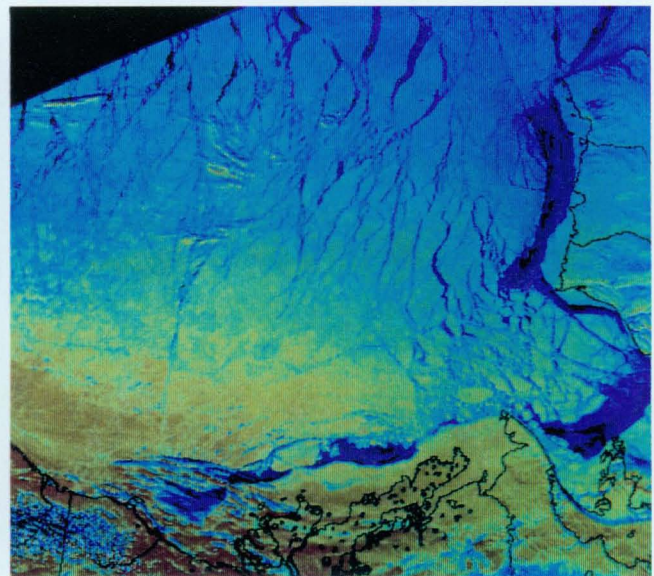
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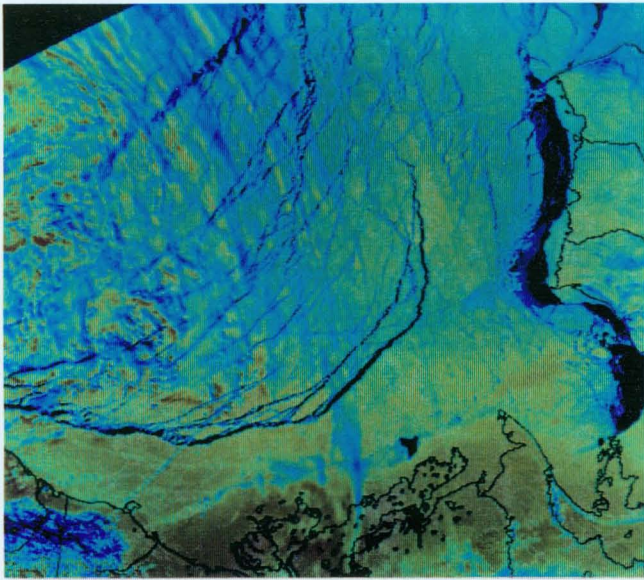
03 February 1987 N9 11052 Band 4



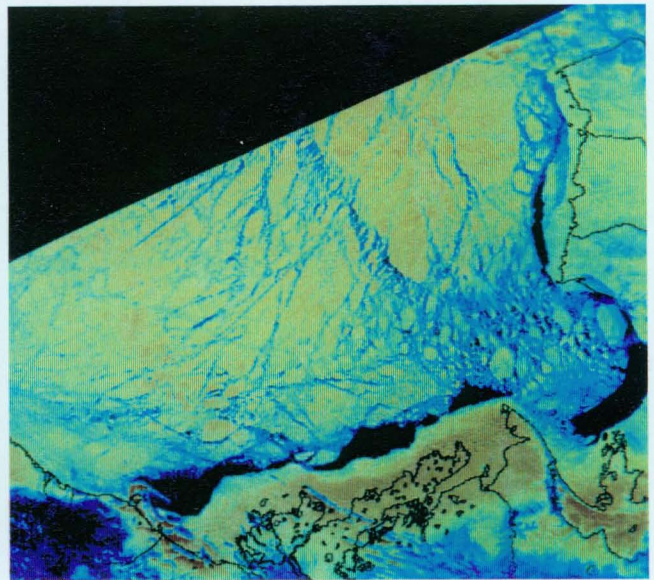
25 March 1987 N9 11758 Band 4



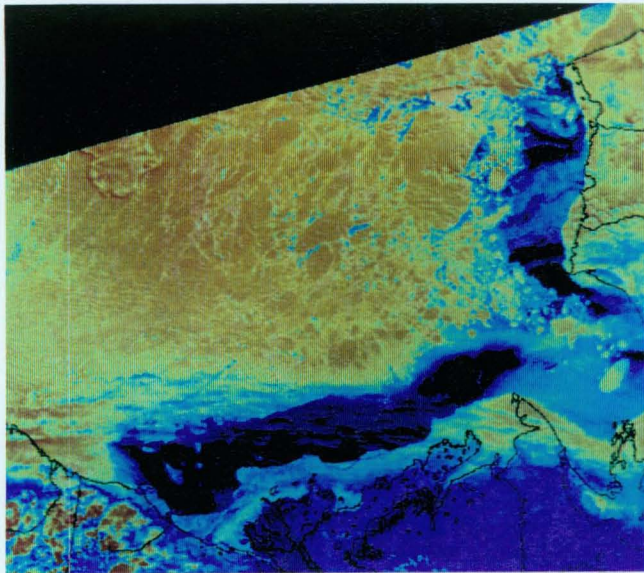
08 April 1987 N9 11955 Band 2



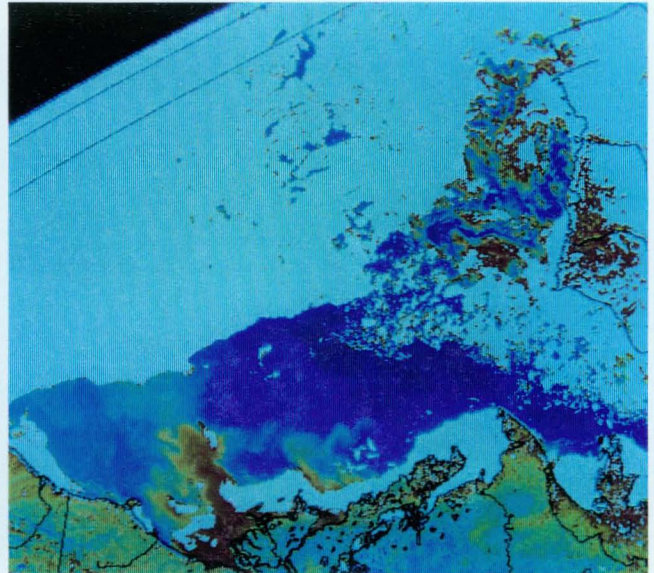
07 May 1987 N9 12364 Band 2



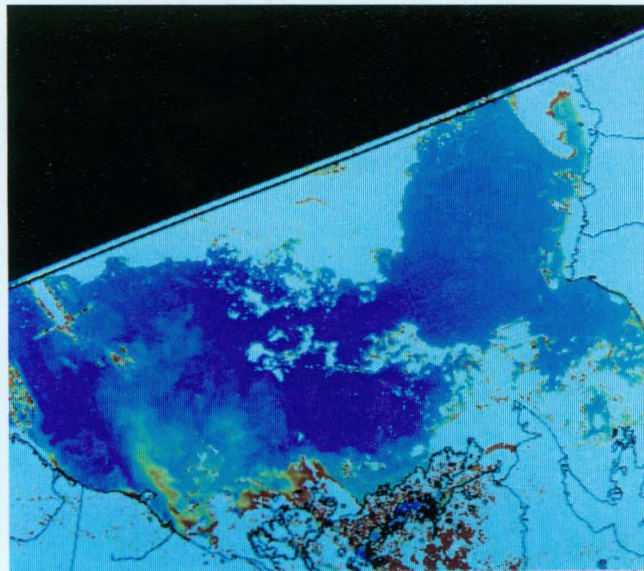
24 May 1987 N9 12604 Band 2



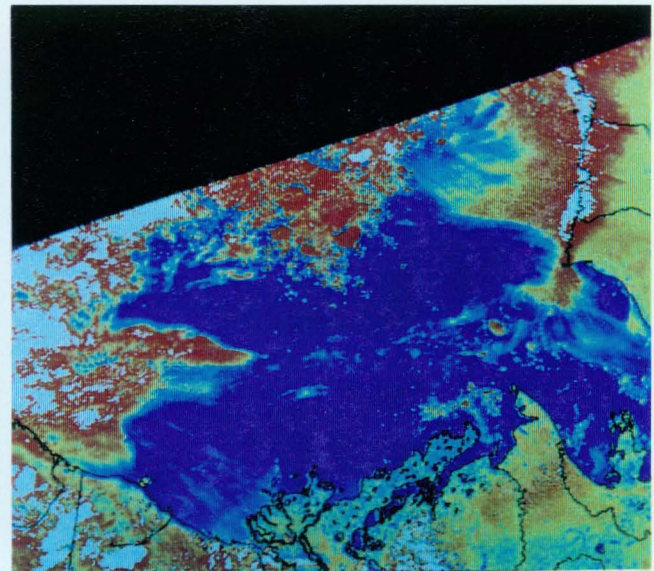
08 June 1987 N9 12816 Band 2



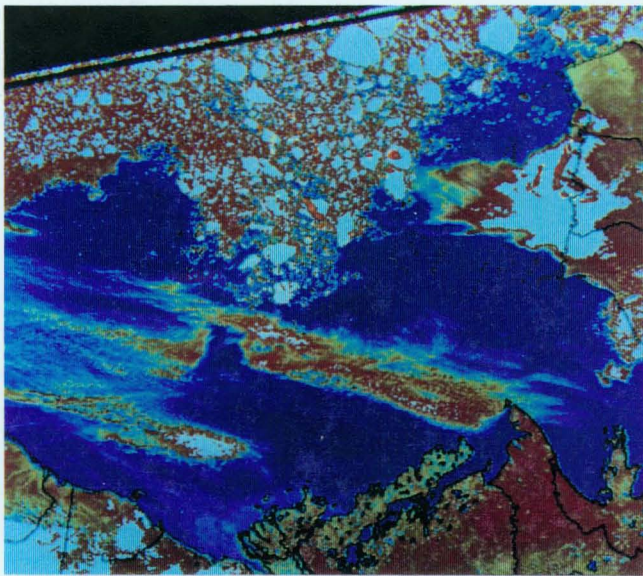
23 June 1987 N9 13027 Band 1



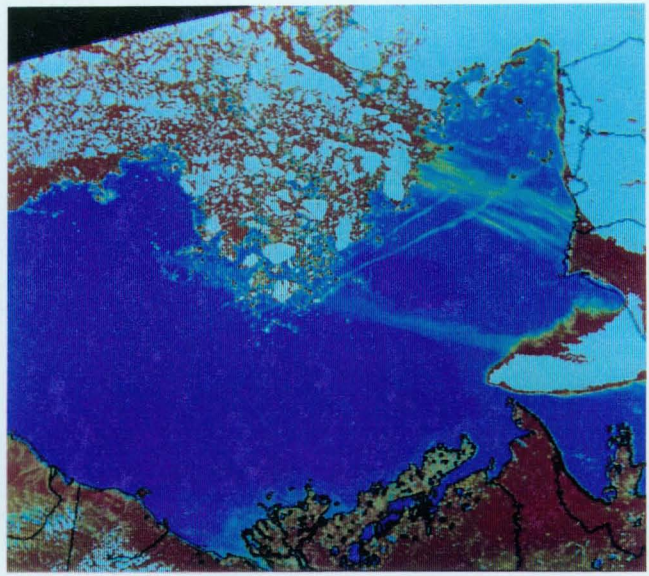
08 July 1987 N9 13239 Band 2



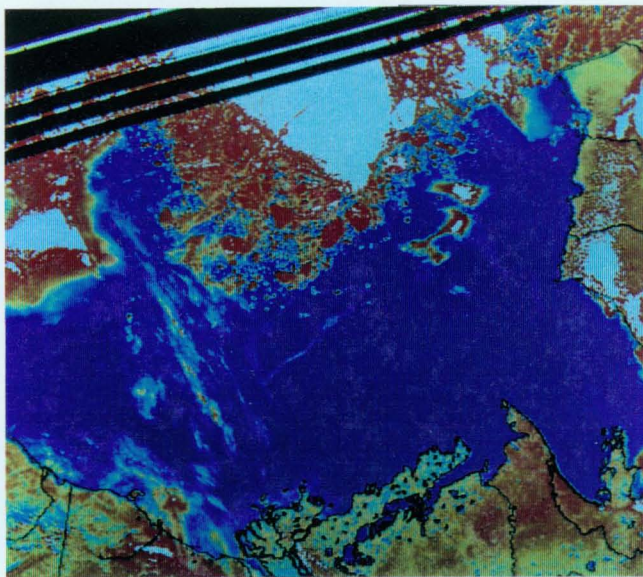
16 July 1987 N9 13352 Band 2



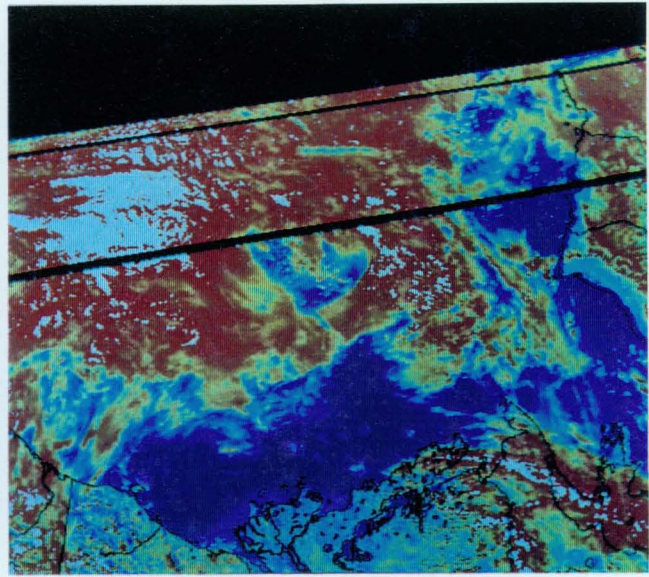
01 August 1987 N9 13578 Band 2



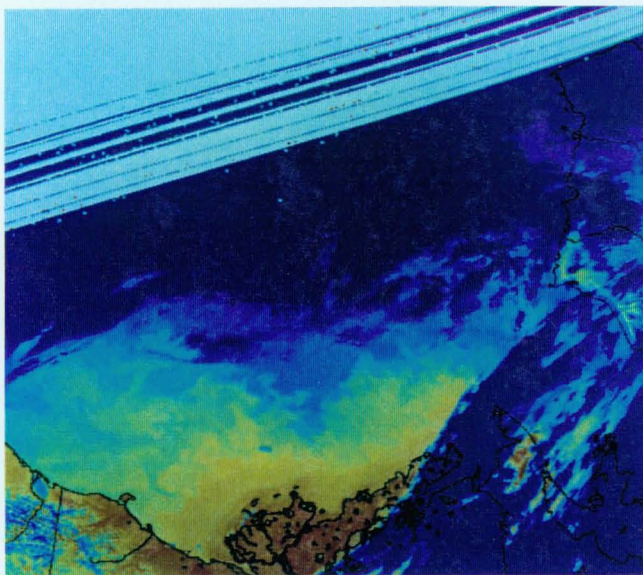
02 August 1987 N9 13592 Band 2



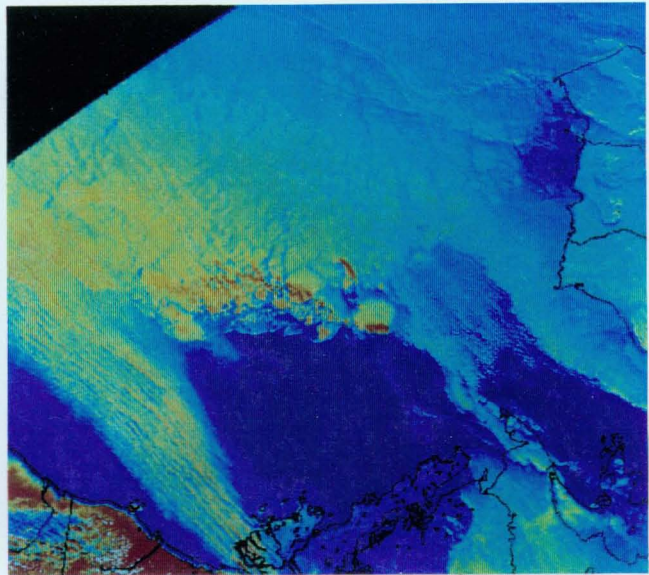
12 August 1987 N9 13733 Band 2



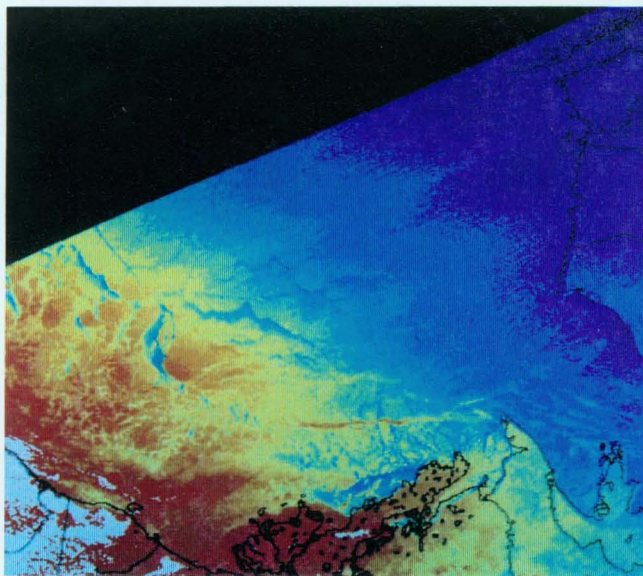
18 August 1987 N9 13818 Band 2



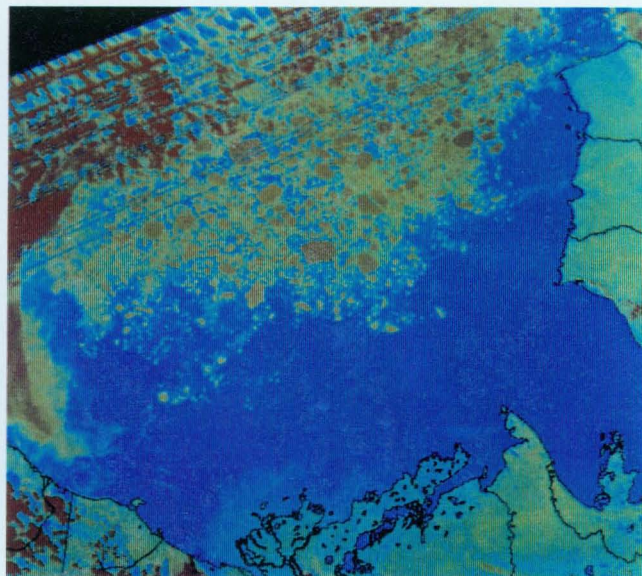
09 September 1987 N9 14128 Band 2



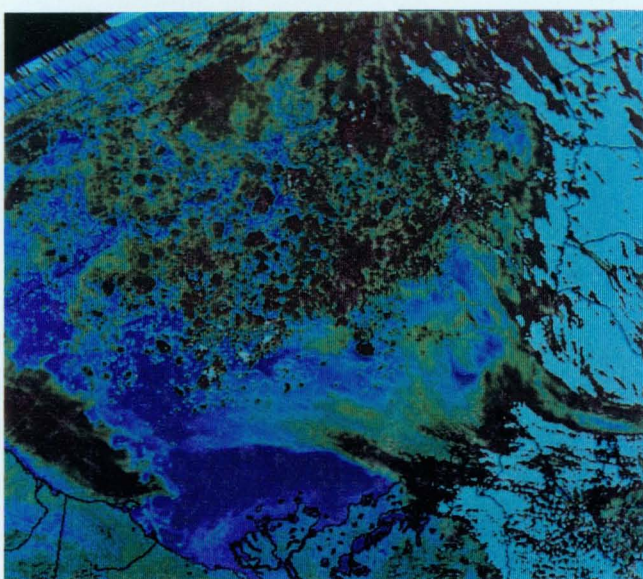
14 October 1987 N9 14621 Band 2



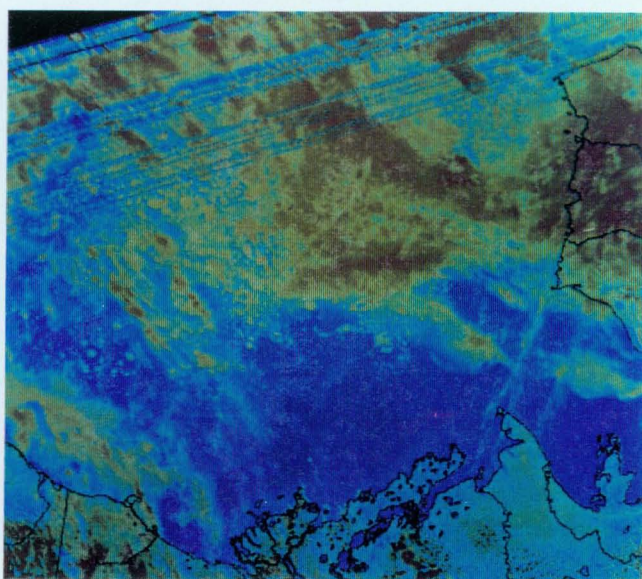
06 November 1987 N9 14946 Band 1



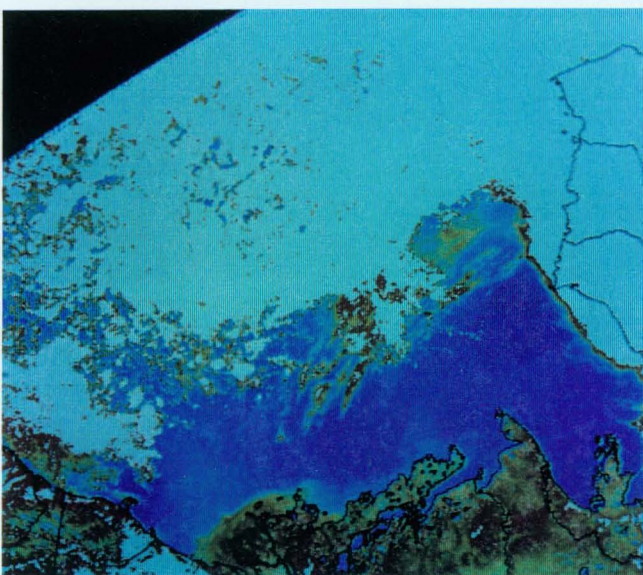
29 July 1988 N9 18699 Band 2



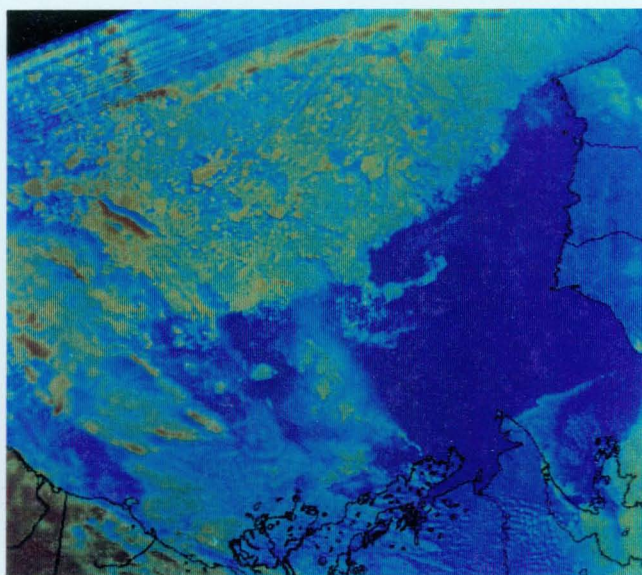
10 August 1988 N9 18868 Band 2



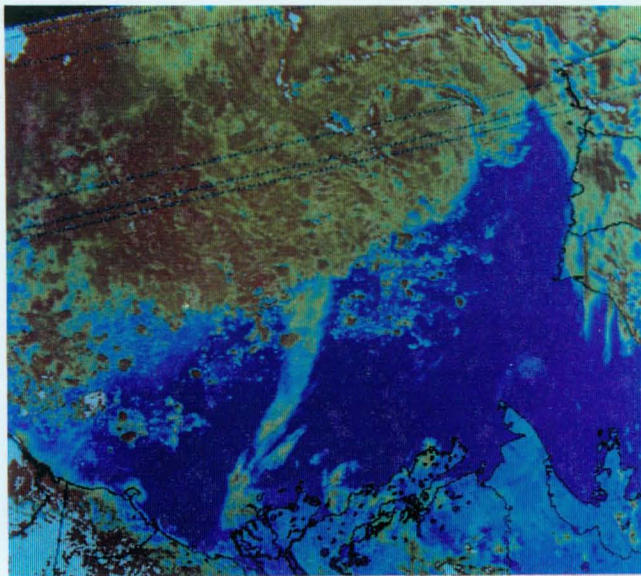
14 August 1988 N9 18925 Band 2



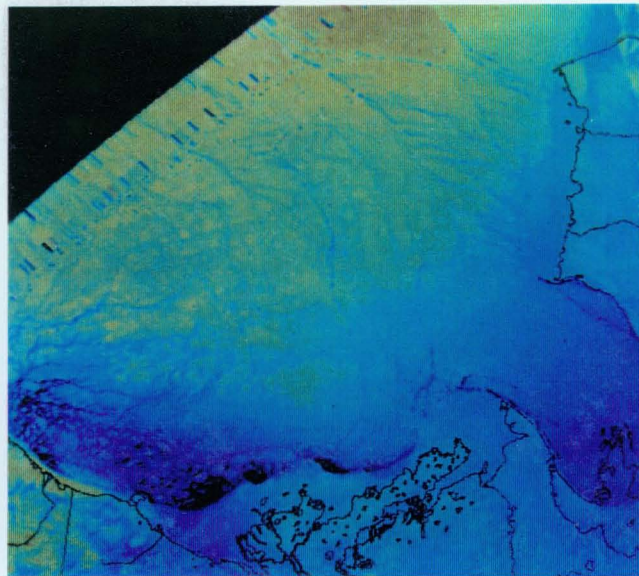
17 September 1988 N9 19404 Band 2



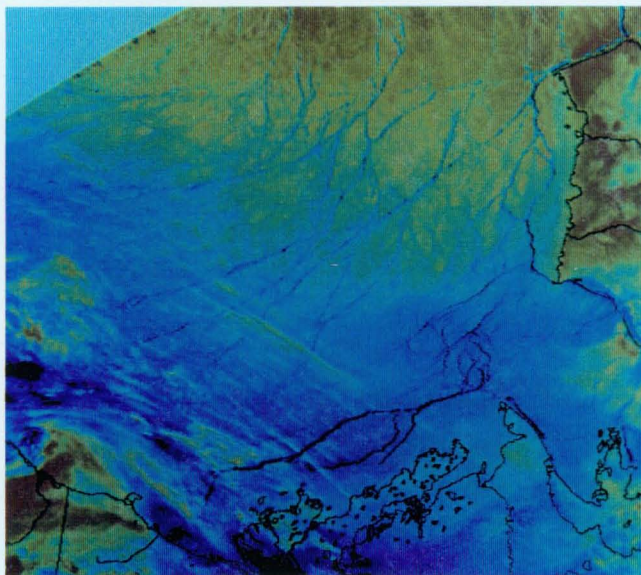
22 September 1988 N9 19475 Band 2



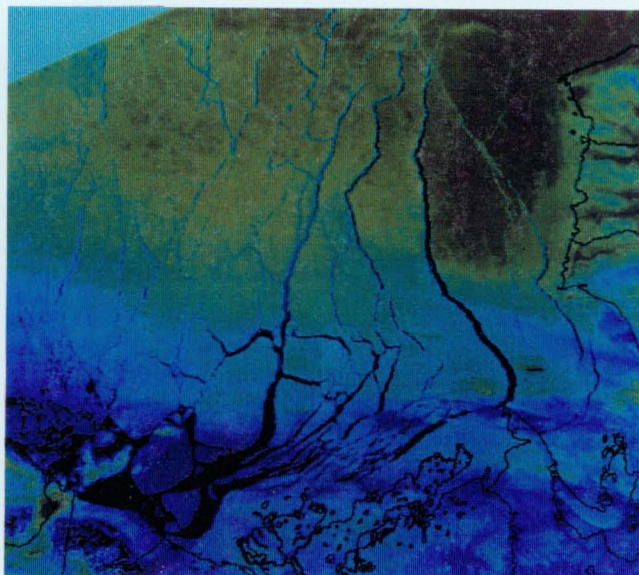
27 September 1988 N9 19546 Band 2



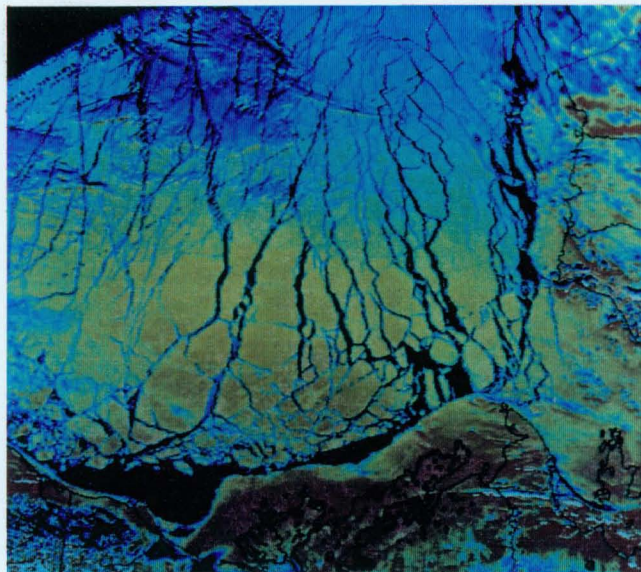
23 February 1989 N11 2149 Band 4



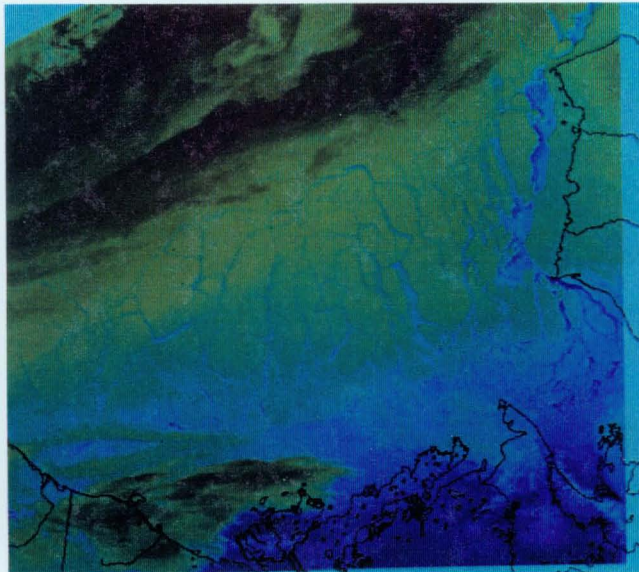
02 March 1989 N11 2248 Band 4



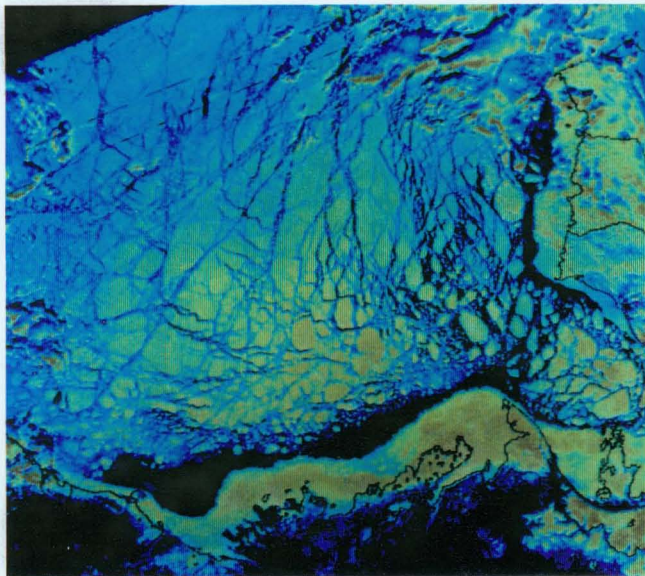
29 March 1989 N11 2629 Band 4



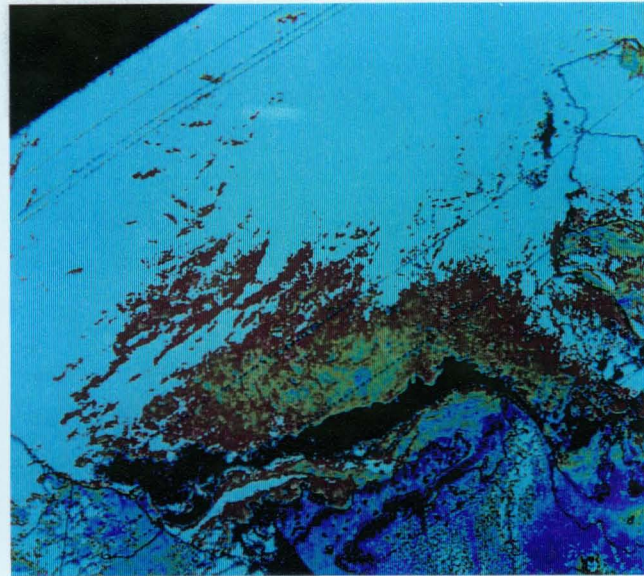
19 April 1989 N11 2925 Band 2



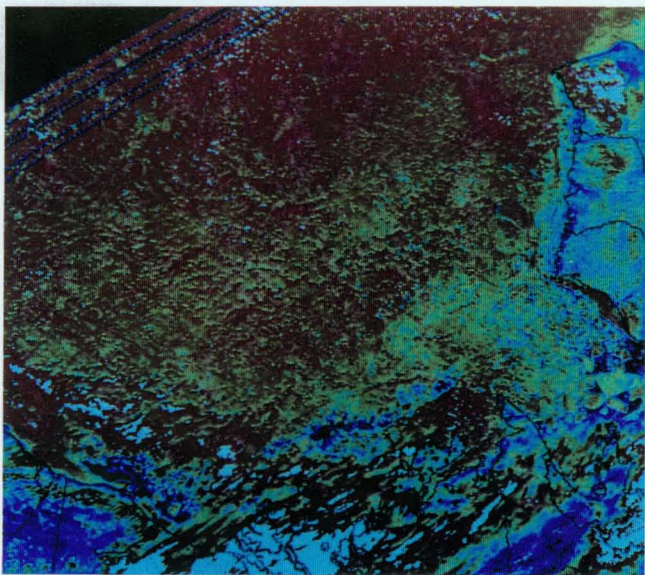
28 April 1989 N11 3052 Band 2



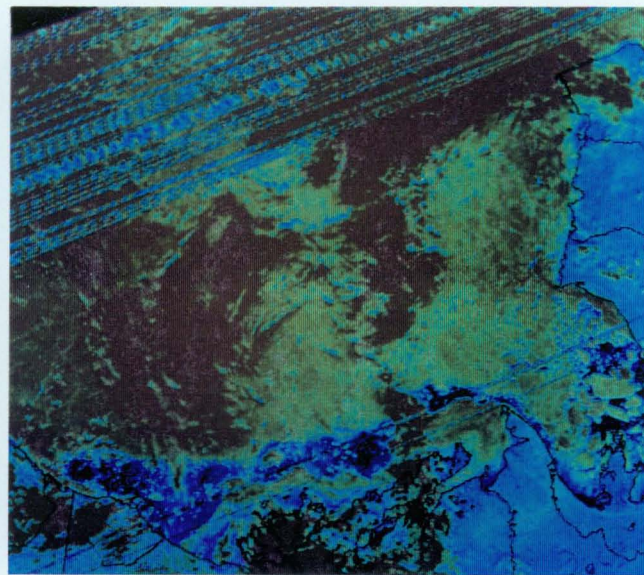
26 May 1989 N11 3447 Band 2



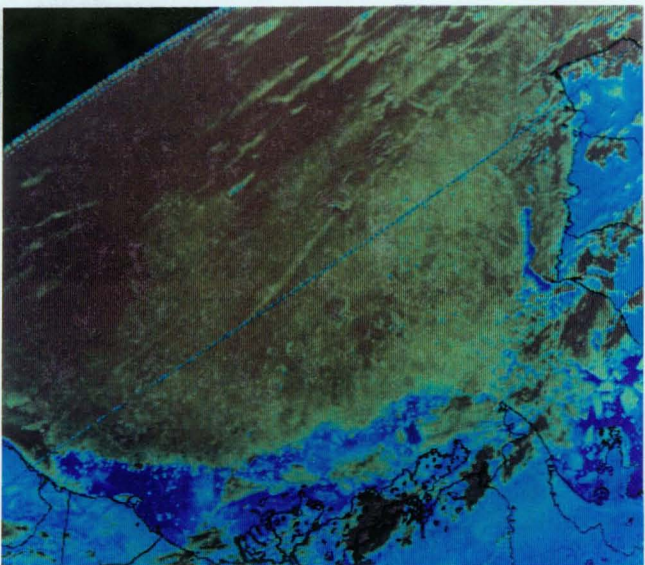
09 June 1989 N11 3644 Band 2



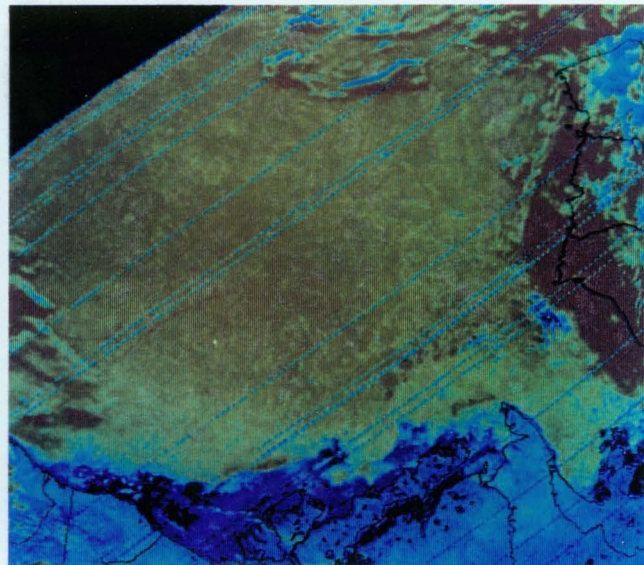
18 June 1989 N11 3771 Band 2



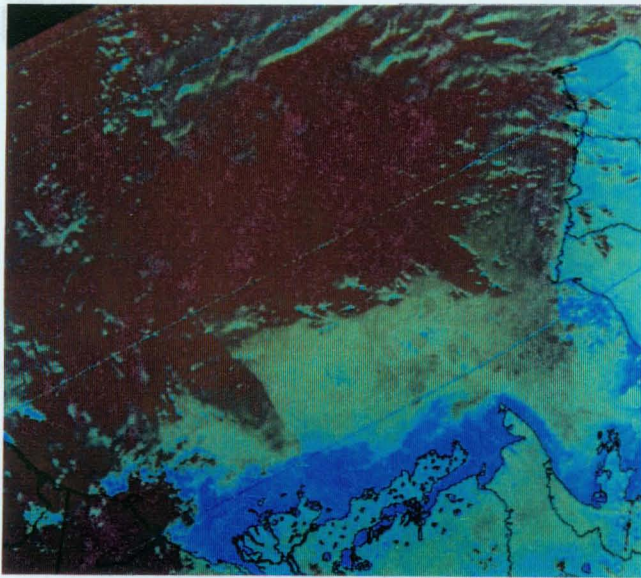
23 June 1989 N11 3842 Band 2



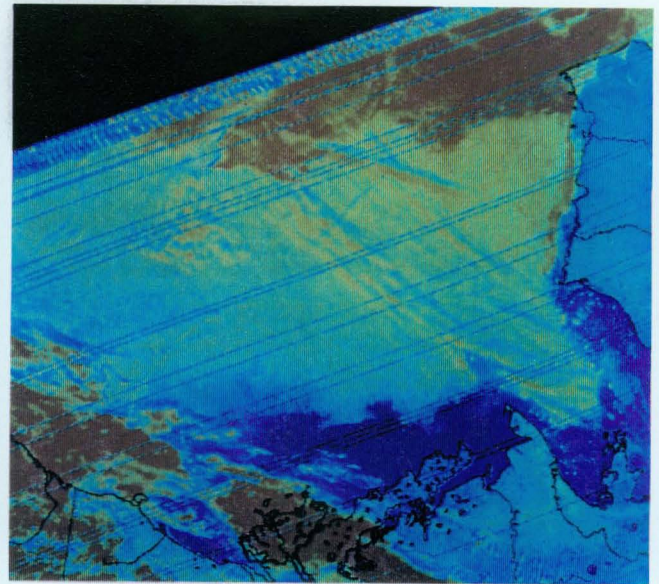
28 June 1989 N11 3912 Band 2



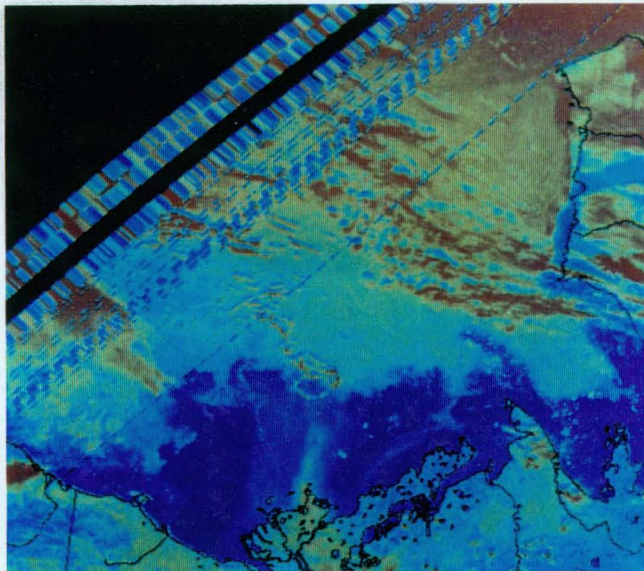
08 July 1989 N11 4053 Band 2



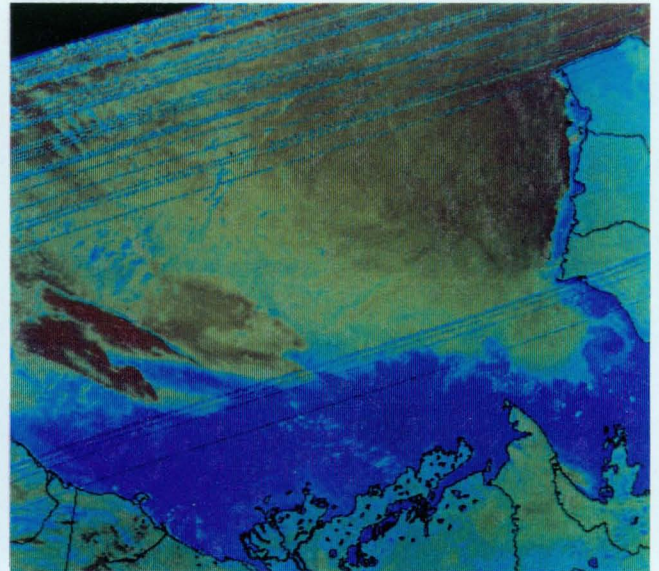
15 July 1989 N11 4152 Band 2



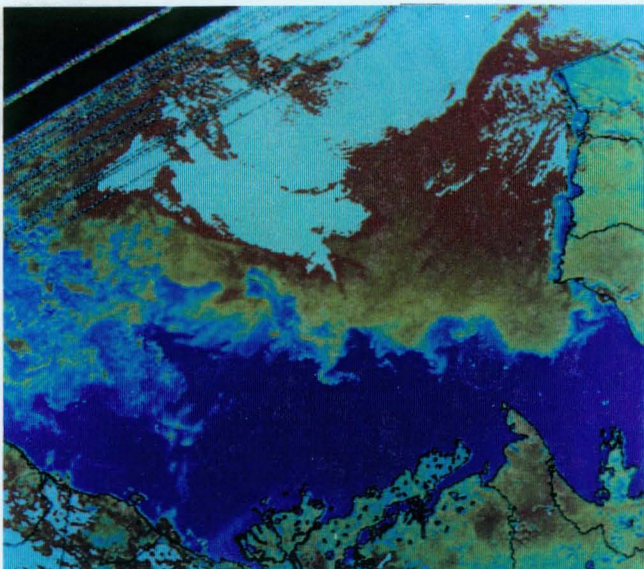
31 July 1989 N11 4378 Band 2



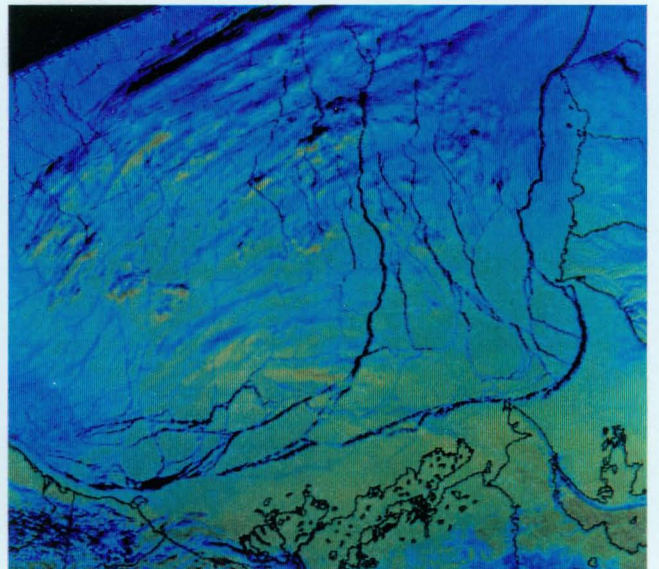
08 August 1989 N11 4490 Band 2



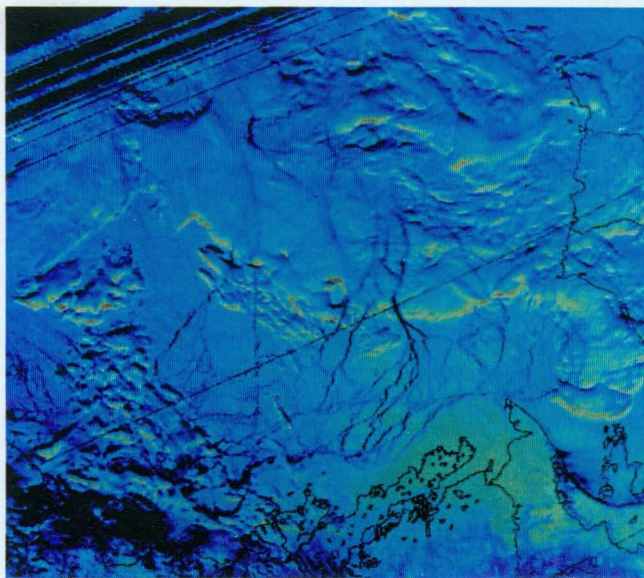
18 August 1989 N11 4632 Band 2



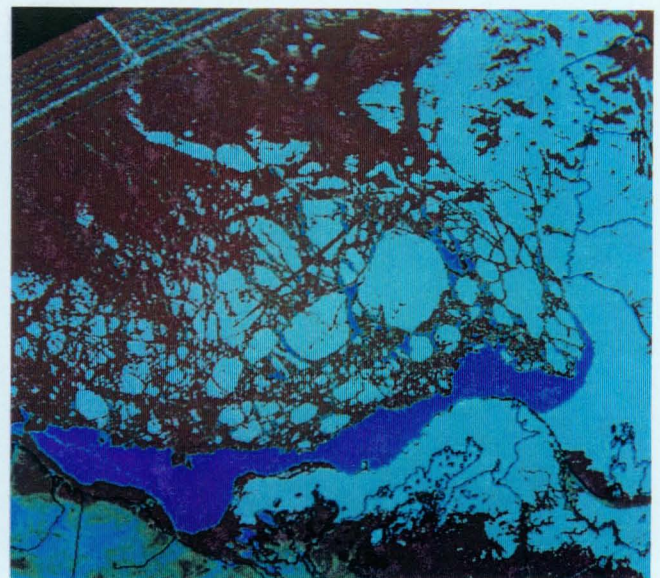
24 August 1989 N11 4716 Band 2



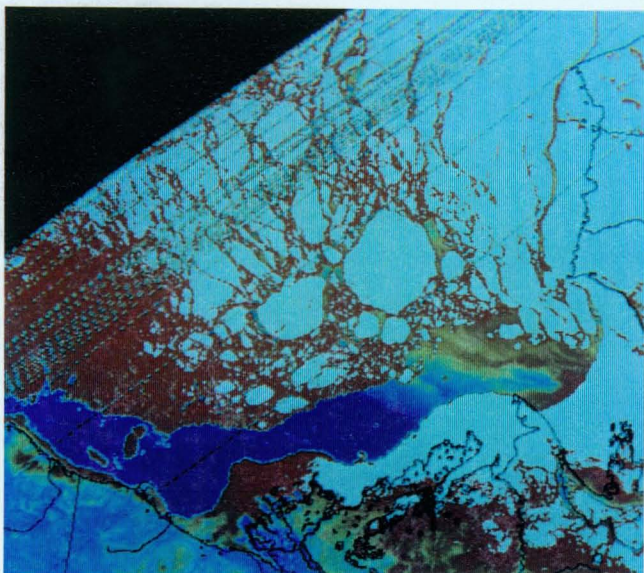
24 April 1990 N11 8144 Band 2



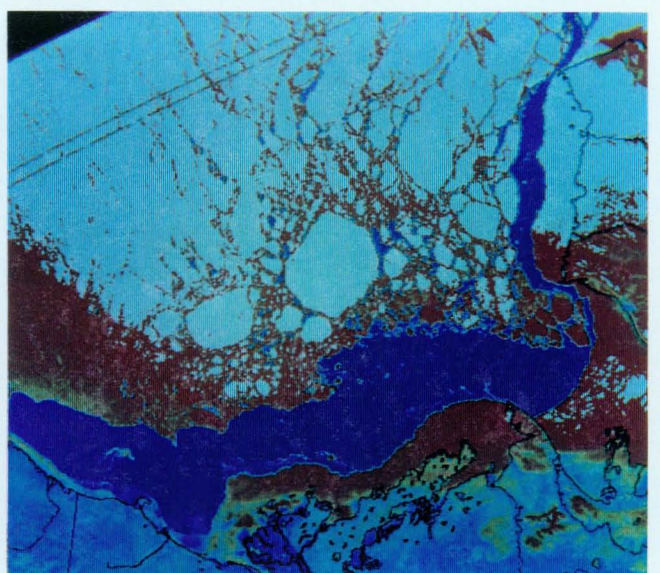
11 May 1990 N11 8384 Band 2



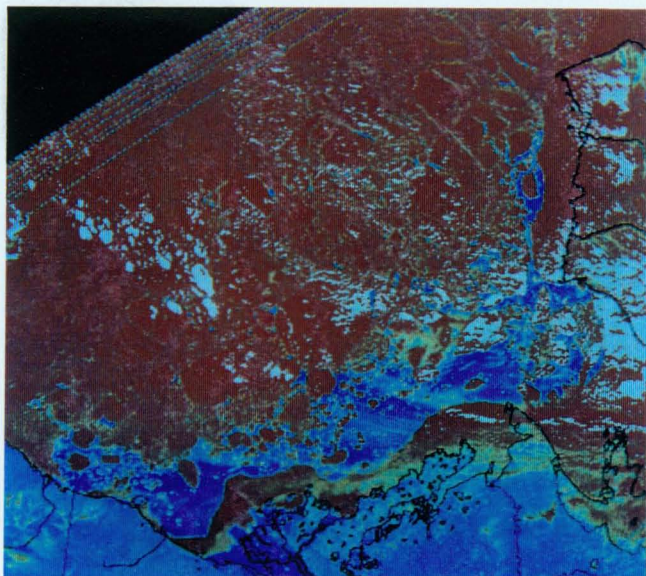
23 May 1990 N11 8539 Band 2



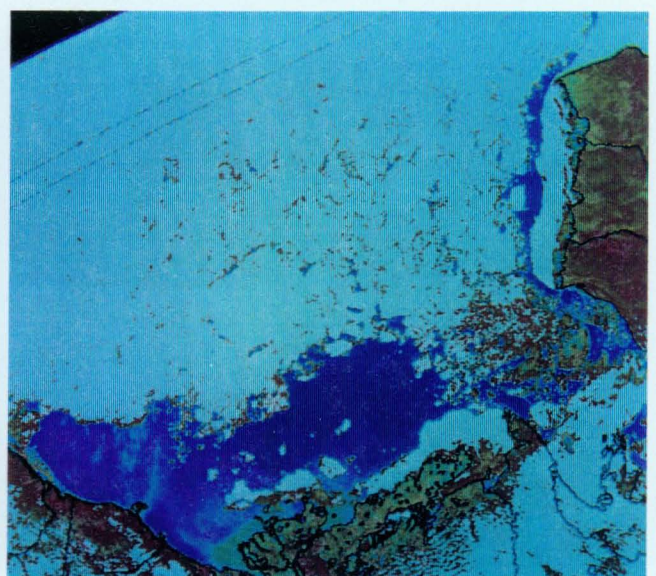
26 May 1990 N11 8595 Band 2



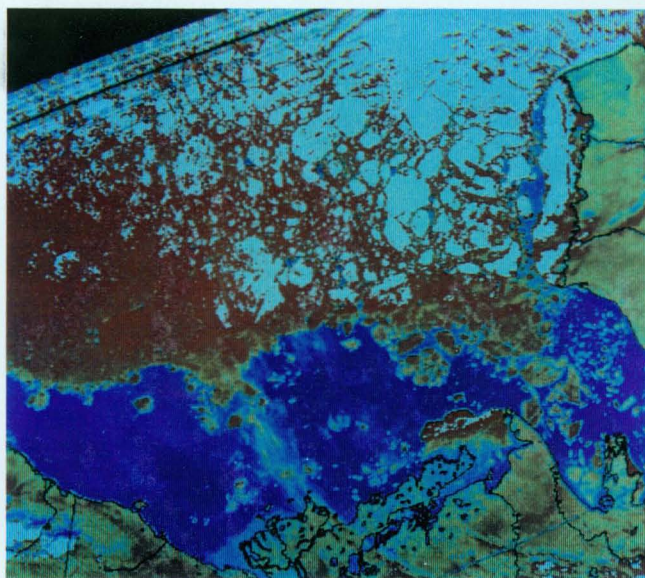
31 May 1990 N11 8666 Band 2



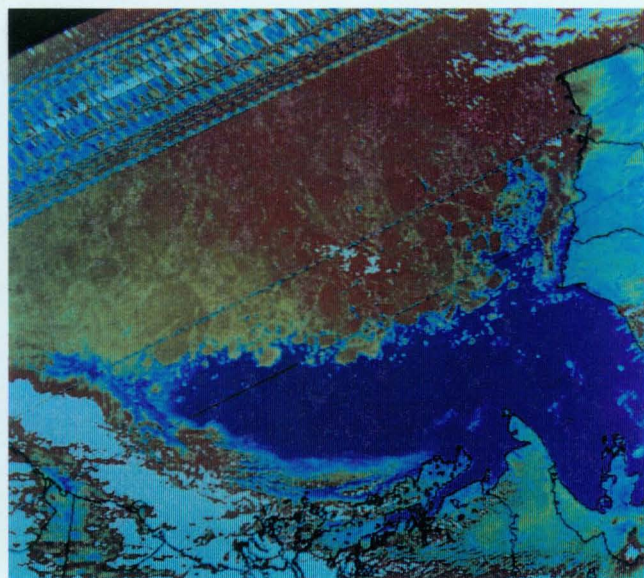
12 June 1990 N11 8835 Band 2



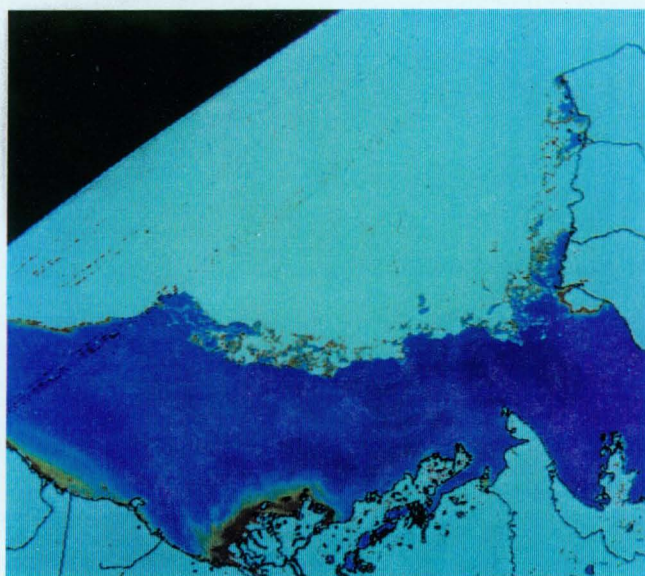
28 June 1990 N11 9061 Band 2



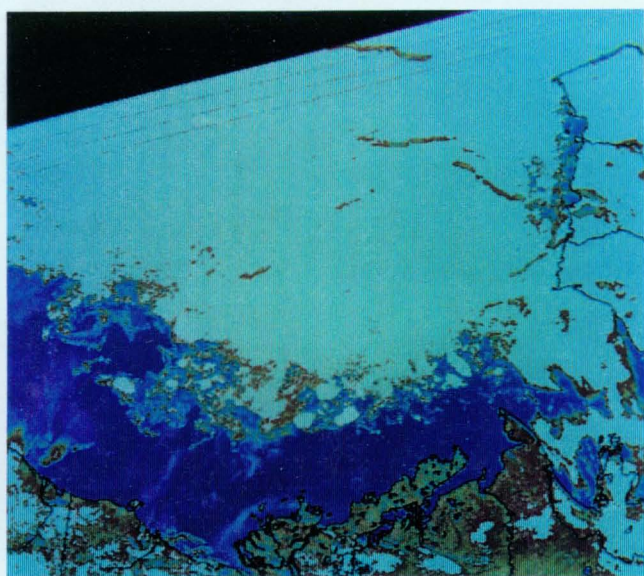
05 July 1990 N11 9160 Band 2



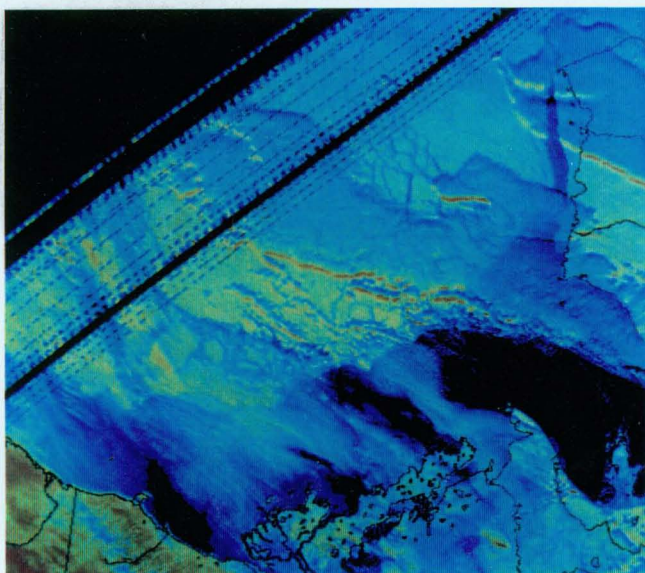
25 July 1990 N11 9442 Band 2



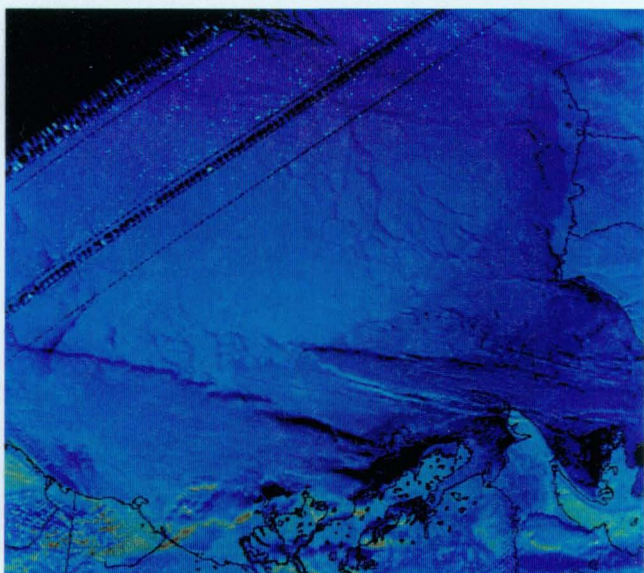
16 August 1990 N11 9752 Band 2



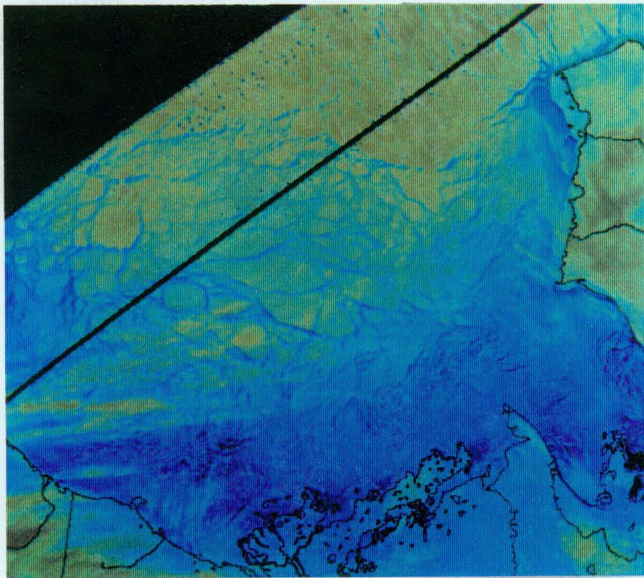
13 September 1990 N11 10148 Band 2



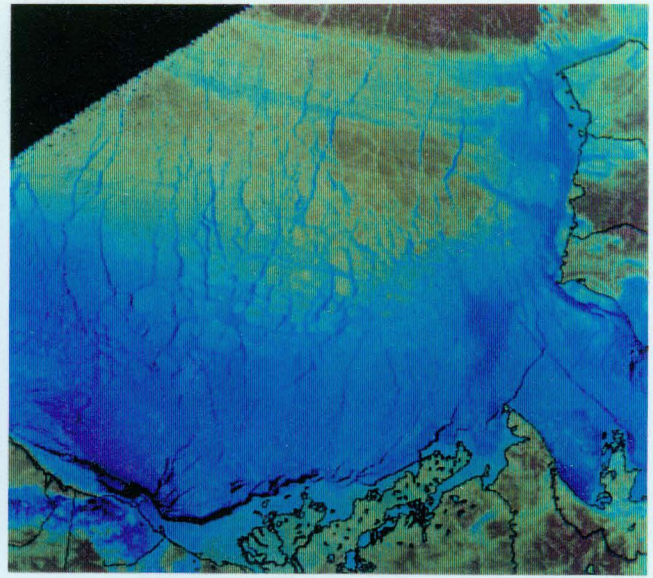
10 October 1990 N11 10528 Band 2



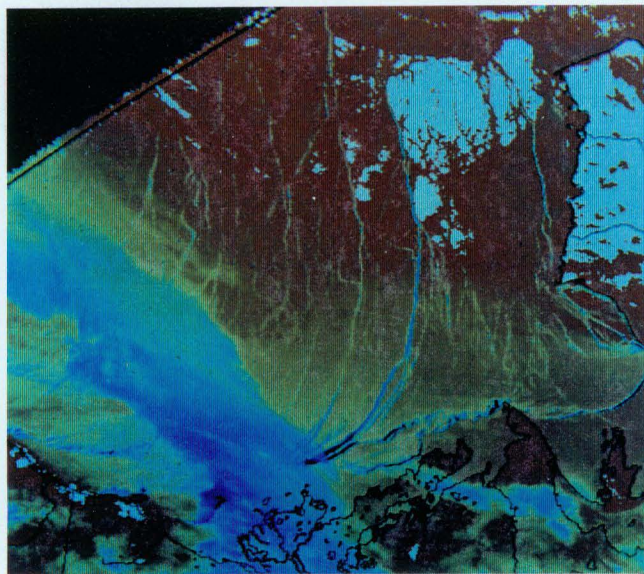
27 October 1990 N11 10768 Band 2



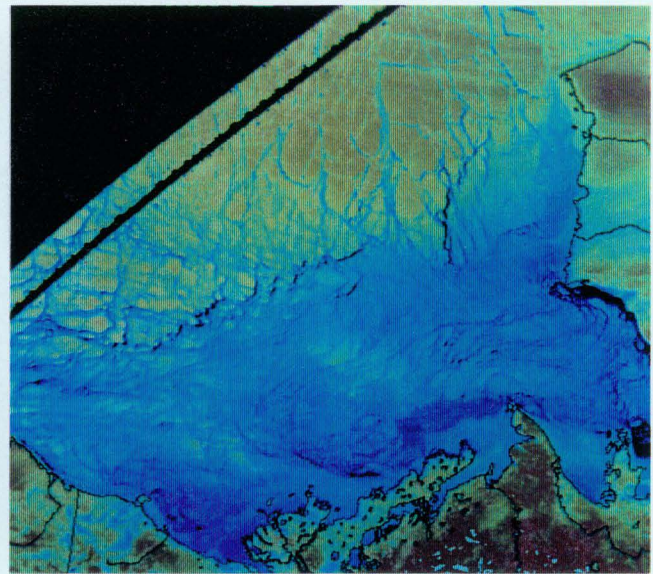
06 November 1990 N11 10909 Band 4



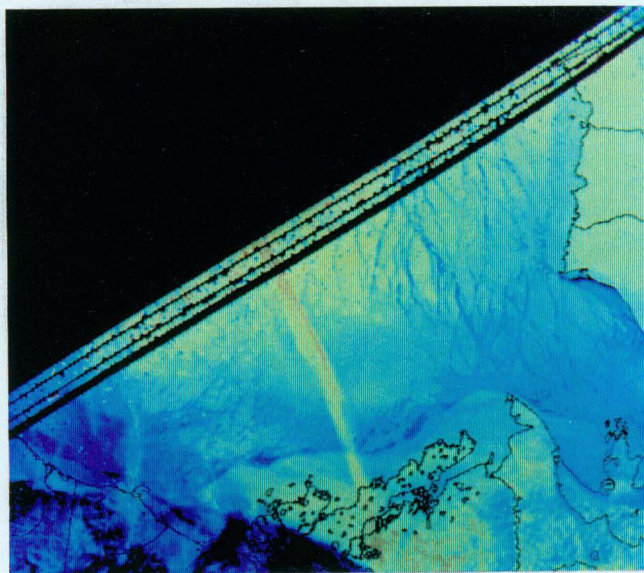
23 November 1990 N11 11149 Band 4



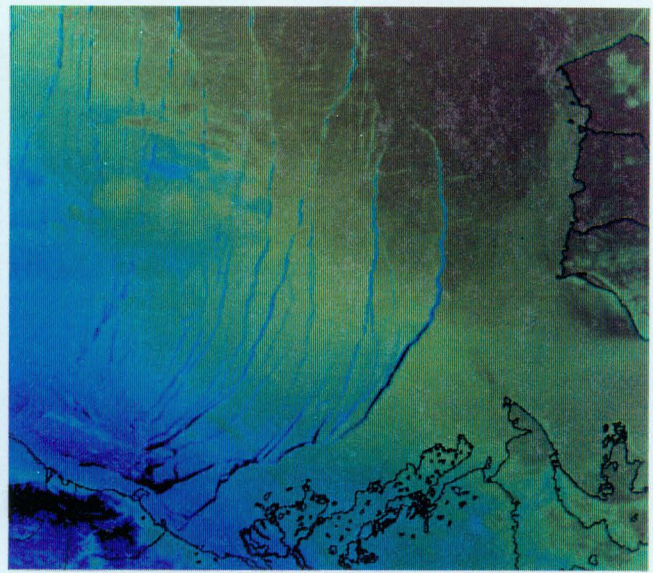
11 December 1990 N11 11403 Band 4



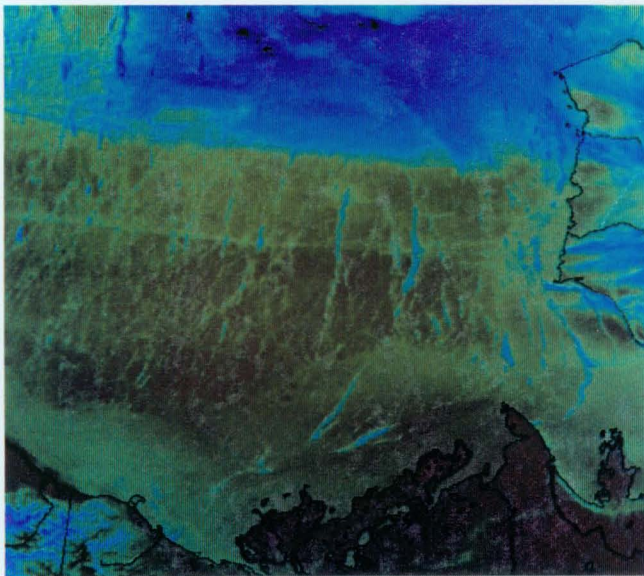
22 December 1990 N11 11558 Band 4



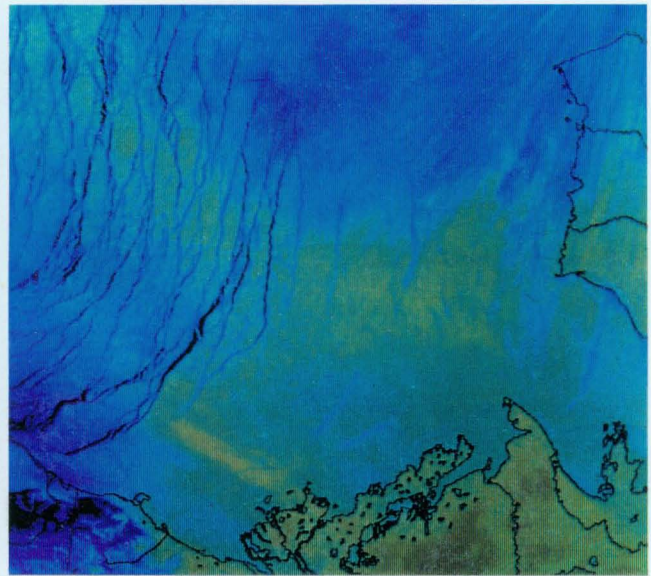
24 January 1991 N11 12024 Band 4



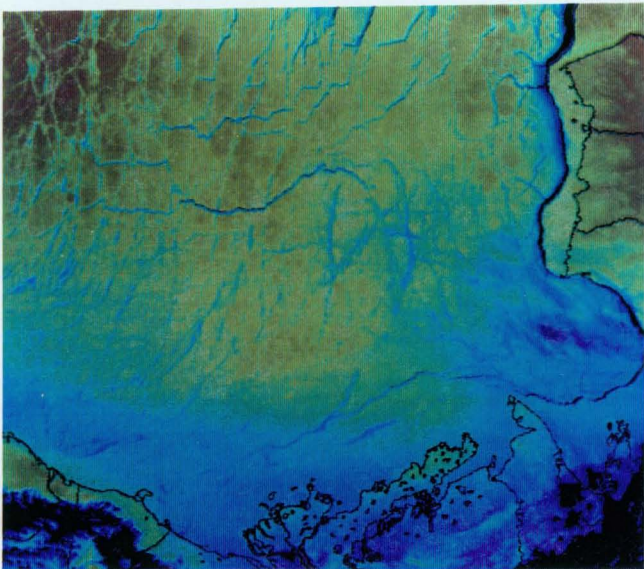
11 February 1991 N11 12278 Band 4



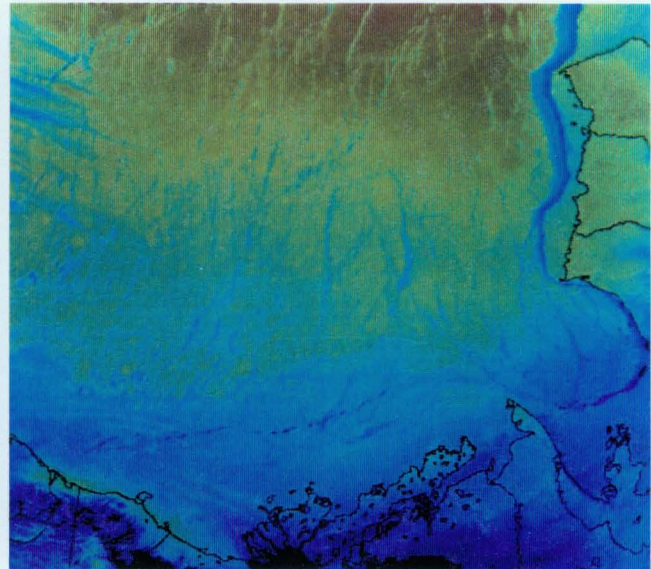
22 February 1991 N11 12433 Band 4



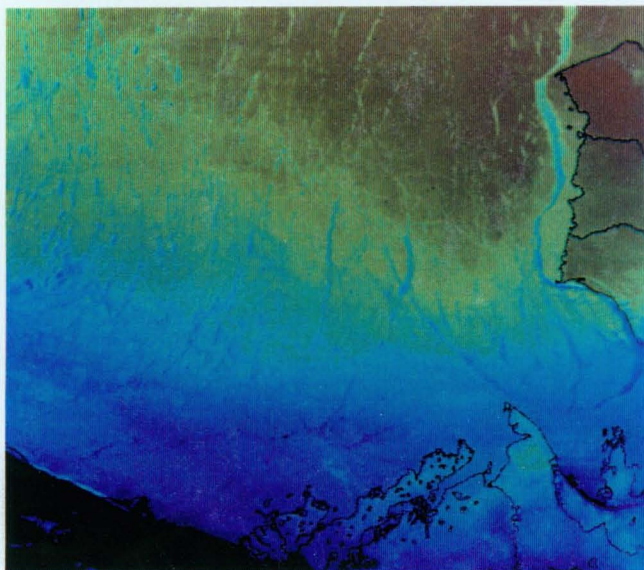
05 March 1991 N10 23173 Band 4



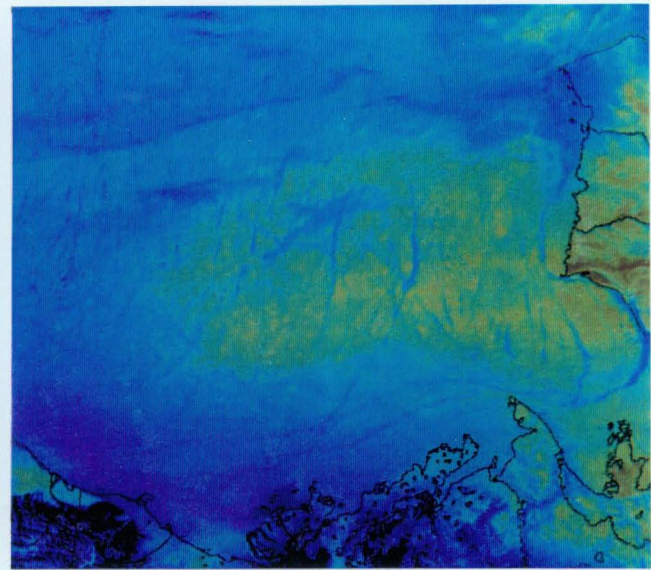
15 March 1991 N10 23315 Band 4



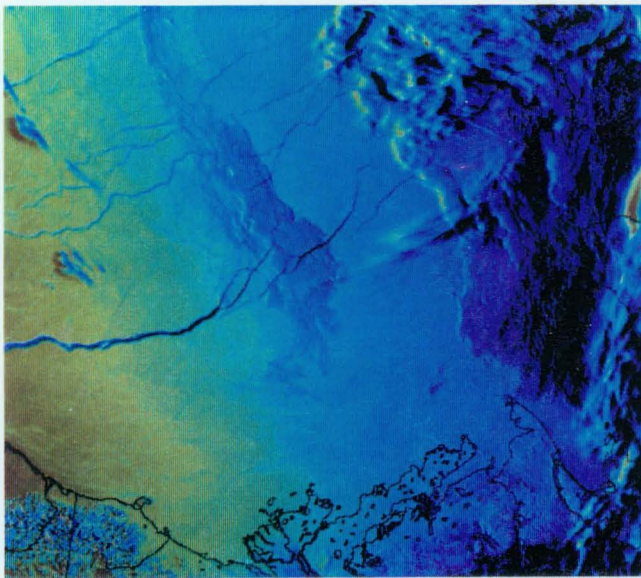
21 March 1991 N11 12814 Band 4



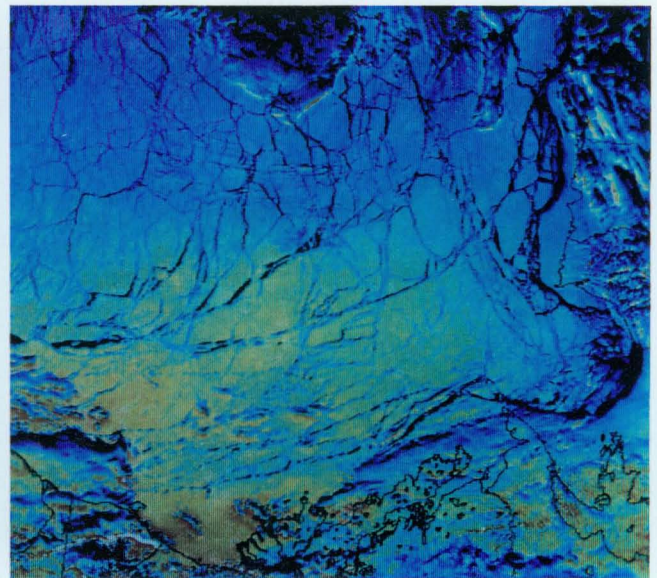
24 March 1991 N11 12857 Band 4



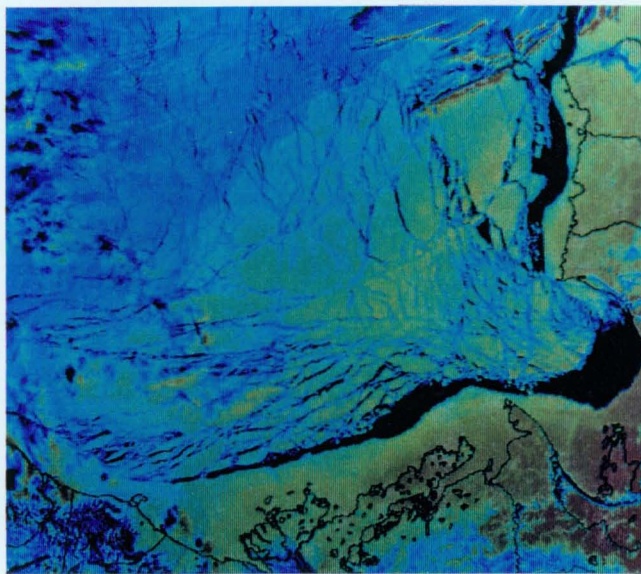
03 April 1991 N10 23586 Band 4



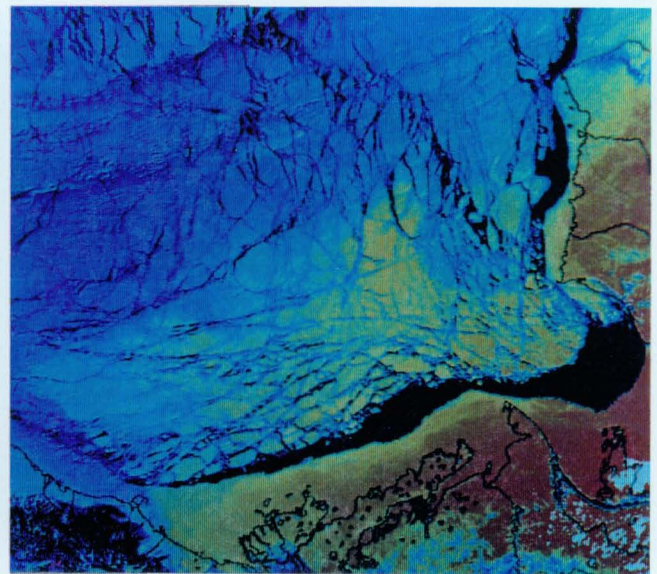
12 April 1991 N10 23714 Band 2



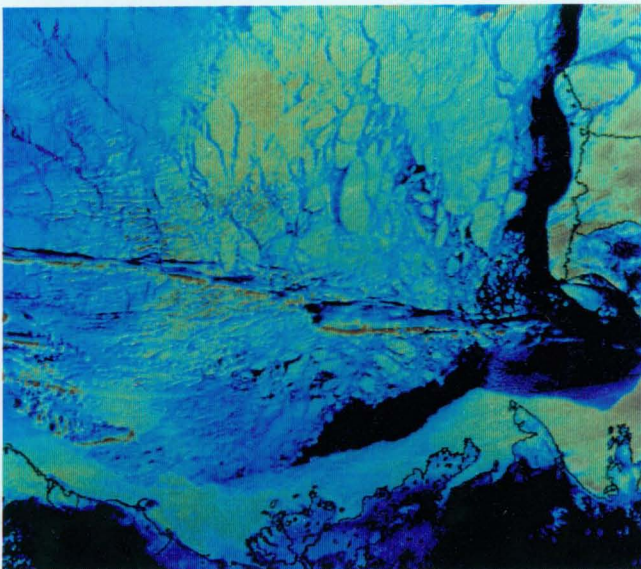
19 April 1991 N11 13224 Band 2



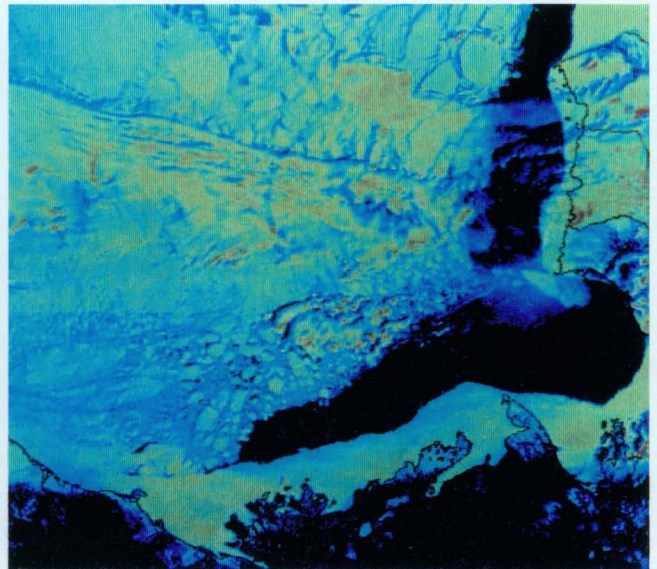
25 April 1991 N10 23908 Band 2



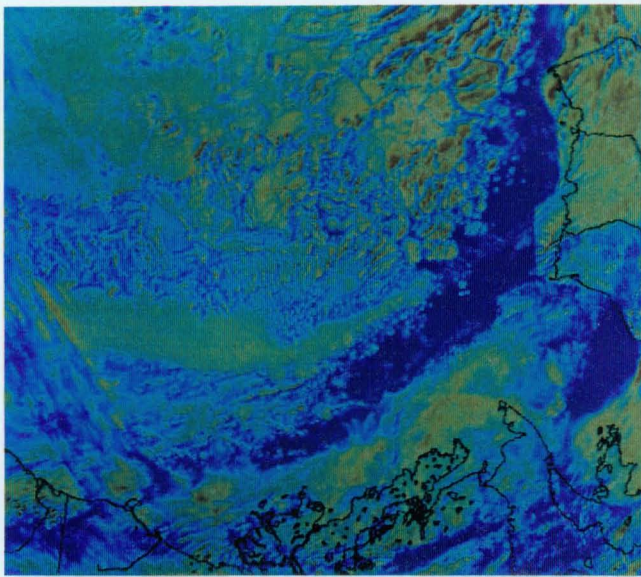
28 April 1991 N10 23951 Band 2



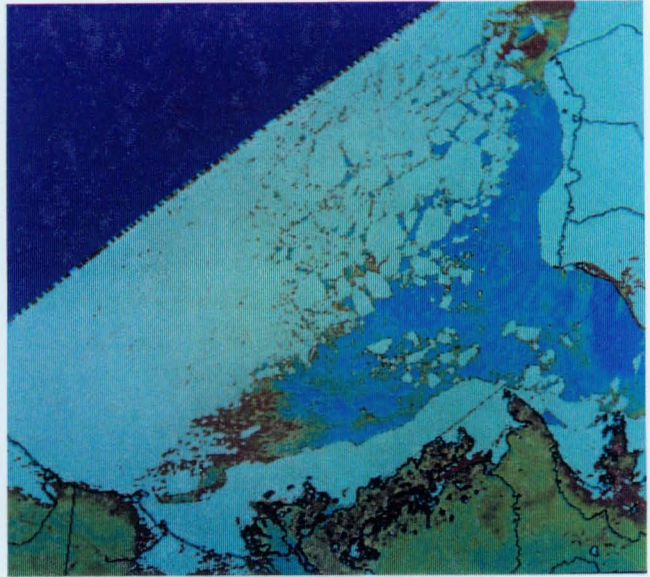
08 May 1991 N10 24093 Band 2



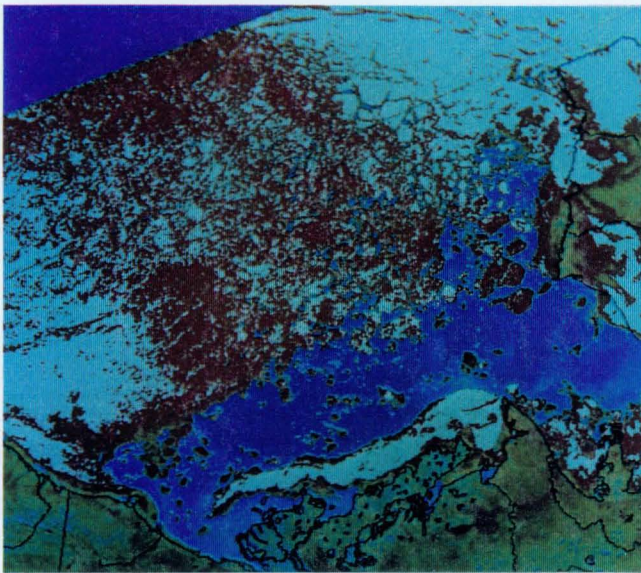
13 May 1991 N10 24164 Band 2



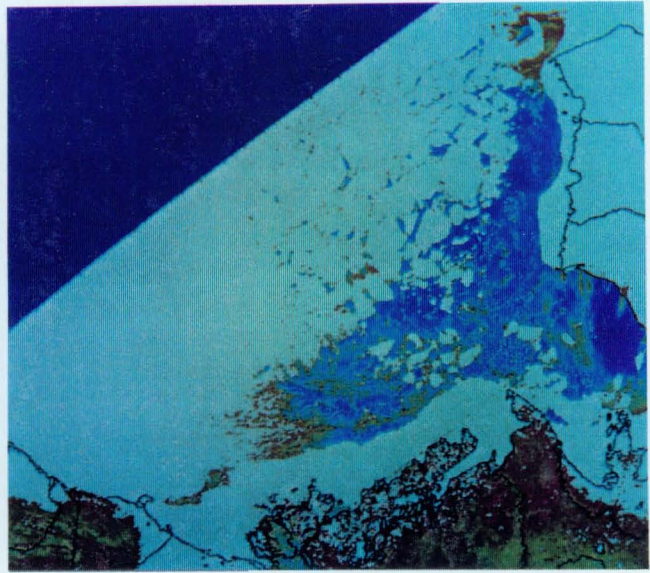
22 May 1991 N10 24292 Band 2



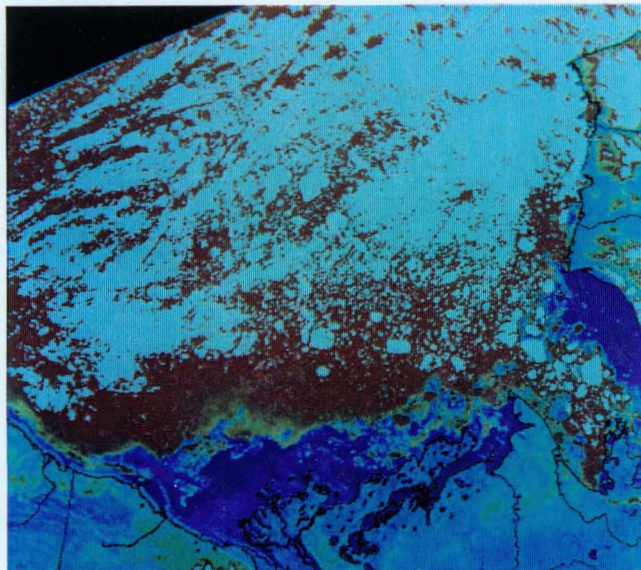
07 June 1991 N11 13915 Band 2



28 June 1991 N11 14212 Band 2



05 July 1991 N11 14310 Band 2



29 August 1991 N11 15087 Band 2

APPENDIX A

Complete list of geo-referenced NOAA AVHRR data of the Beaufort Sea,
1980 - 1991, in IOS archives (March 1992)

Institute of Ocean Sciences
CATALOGUE of GEO-REFERENCED AVHRR DATA
Beaufort Sea 1980 - 1991

Date	Week	Satellite	Orbit	Bands
1980				
05 AUGUST	32	TN	9345	2,4
23 AUGUST	34	NOAA		2,4
24 AUGUST	35	TN	9613	2,4
26 AUGUST	35	NOAA		2,3,4
31 AUGUST	36	NOAA		2,4
03 SEPTEMBER	36	NOAA		1,2,5
1981				
05 AUGUST	32	NOAA		1,4
06 AUGUST	32	NOAA		1,2,4
06 SEPTEMBER	37	N7	1065	2,3,4
1982				
24 AUGUST	35	N7	6035	1,2,3,4,5
13 SEPTEMBER	38	NOAA		1,4
1983				
14 AUGUST	34	N7	11036	2,4
22 AUGUST	35	N7	11150	1,4
23 AUGUST	35	N7	11163	1,2,3,4,5
26 AUGUST	35	N7	11206	2,4
12 SEPTEMBER	38	N7	11446	2,4
13 SEPTEMBER	38	N7	11460	1,2,3,4
18 SEPTEMBER	39	N7	11542	2,4
28 SEPTEMBER	40	N7	11672	1,2,3,4
29 SEPTEMBER	40	N7	11686	1,2,3,4
05 DECEMBER	50	N7	12643	1,2,3,4,5
07 DECEMBER	50	N7	12671	1,2,3,4,5
09 DECEMBER	50	N7	12699	1,2,3,4,5
12 DECEMBER	51	N7	12742	1,2,3,4,5
16 DECEMBER	51	N7	12798	1,2,3,4,5
29 DECEMBER	53	N7	12982	1,2,3,4,5
1984				
04 JANUARY	01	N7	13067	1,2,3,4,5
09 JANUARY	02	N7	13137	1,2,3,4,5
10 JANUARY	02	N7	13151	1,2,3,4,5
11 JANUARY	02	N7	13165	1,2,3,4,5
02 FEBRUARY	05	N7	13462	1,2,3,4,5
27 FEBRUARY	09	N7	13829	1,2,3,4,5
29 FEBRUARY	09	N7	13858	1,2,3,4,5
12 MARCH	11	N7	14027	1,2,3,4,5
13 MARCH	11	N7	14041	1,2,3,4,5

1984

14 MARCH	11	N7 14055	1,2,3,4,5
15 MARCH	11	N7 14070	1,2,3,4,5
03 APRIL	14	N7 14338	1,2,3,4,5
06 APRIL	14	N7 14380	1,2,3,4,5
10 APRIL	15	N7 14436	1,2,3,4,5
24 APRIL	17	N7 14634	1,2,3,4,5
17 MAY	20	N7 14959	1,2,3,4,5
18 MAY	20	N7 14973	1,2,3,4,5
05 JUNE	23	N7 15227	1,2,3,4,5
06 JUNE	23	N7 15242	1,2,3,4,5
07 JUNE	23	N7 15256	1,2,3,4,5
11 JUNE	24	N7 15312	1,2,3,4,5
12 JUNE	24	N7 15326	1,2,3,4,5
13 JUNE	24	N7 15340	1,2,3,4,5
15 JUNE	24	N7 15369	1,2,3,4,5
18 JUNE	25	N7 15411	1,2,3,4,5
19 JUNE	25	N7 15425	1,2,3,4,5
24 JUNE	26	N7 15510	1,2,3,4,5
26 JUNE	26	N7 15524	1,2,3,4,5
28 JUNE	26	N7 15552	1,2,3,4,5
20 JULY	29	N7 15863	1,2,3,4,5
26 JULY	30	N7 15948	1,2,3,4,5
27 JULY	30	N7 15962	1,2,3,4,5
28 JULY	30	N7 15976	1,2,3,4,5
08 AUGUST	32	N7 16131	1,2,3,4,5
22 AUGUST	34	N7 16329	1,2,3,4,5
13 SEPTEMBER	37	N7 16640	1,2,4
14 SEPTEMBER	37	N7 16654	1,2,3,4,5
17 SEPTEMBER	38	N7 16697	1,2,3,4,5
23 SEPTEMBER	39	N7 16767	1,2,3,4,5
24 SEPTEMBER	39	N7 16795	1,2,3,4,5
01 OCTOBER	40	N7 16894	1,2,3,4,5
22 OCTOBER	43	N7 17191	1,2,3,4,5
26 OCTOBER	43	N7 17247	1,2,3,4,5
28 OCTOBER	44	N7 17276	1,2,3,4,5
29 OCTOBER	44	N7 17290	1,2,3,4,5
31 OCTOBER	44	N7 17318	1,2,3,4,5
05 NOVEMBER	45	N7 17389	1,2,3,4,5
06 NOVEMBER	45	N7 17403	1,2,3,4,5
07 NOVEMBER	45	N7 17417	1,2,3,4,5
08 NOVEMBER	45	N7 17431	1,2,3,4,5
14 NOVEMBER	46	N7 17515	1,2,3,4,5
16 NOVEMBER	46	N7 17544	1,2,3,4,5
19 NOVEMBER	47	N7 17586	1,2,3,4,5
28 NOVEMBER	48	N7 17713	1,2,3,4,5
03 DECEMBER	49	N7 17784	1,2,3,4,5
04 DECEMBER	49	N7 17798	1,2,3,4,5
07 DECEMBER	49	N7 17841	1,2,3,4,5
10 DECEMBER	50	N7 17883	1,2,3,4,5
12 DECEMBER	50	N7 17911	1,2,3,4,5
13 DECEMBER	50	N7 17925	1,2,3,4,5
18 DECEMBER	51	N7 17996	1,2,3,4,5

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Date	Week	Satellite	Orbit	Bands
1984				
21 DECEMBER	51	N7	18038	1,2,3,4,5
1985				
03 JANUARY	01	N7	18222	1,2,3,4,5
04 JANUARY	01	N7	18236	1,2,3,4,5
08 JANUARY	02	N7	18292	1,2,3,4,5
11 JANUARY	02	N7	18335	1,2,3,4,5
14 JANUARY	03	N9	472	1,2,3,4,5
18 JANUARY	03	N9	529	1,2,3,4,5
21 JANUARY	04	N9	571	1,2,3,4,5
23 JANUARY	04	N9	599	1,2,3,4,5
24 JANUARY	04	N9	613	1,2,3,4,5
25 JANUARY	04	N9	627	1,2,3,4,5
27 JANUARY	05	N9	656	1,2,3,4,5
29 JANUARY	05	N9	684	1,2,3,4,5
30 JANUARY	05	N9	698	1,2,3,4,5
31 JANUARY	05	N9	712	1,2,3,4,5
23 MARCH	12	N9	1440	2,3,4
26 MARCH	13	N9	1485	2,3,4,
30 MARCH	13	N9	1542	2,3,4
31 MARCH	14	N9	1556	2,3,4
10 APRIL	15	N9	1698	2,3,4
17 APRIL	16	N6	31096	2,3,4
28 APRIL	18	N9	1952	2,3,4
30 APRIL	18	N9	1966	1,2,4
01 MAY	18	N6	30383	1,2,4
02 MAY	18	N9	1995	1,2,4
04 MAY	18	N9	2024	1,2,3,4
05 MAY	19	N6	30440	1,2,4
10 MAY	19	N9	2120	2,3,4
16 MAY	20	N9	2193	2,4
17 MAY	20	N9	2207	2,3,4
18 MAY	20	N9	2233	2,3,4
19 MAY	21	N9	2235	2,4
22 MAY	21	N9	2290	2,3,4
29 MAY	22	N9	2376	2,4
30 MAY	22	N9	2390	2,3,4
30 MAY	22	N9	2391	2,3,4
01 JUNE	22	N6	30825	2,3,4
01 JUNE	22	N9	2419	2,3,4
02 JUNE	23	N6	30839	2,3,4
04 JUNE	23	N9	2473	2,4
07 JUNE	23	N9	2525	2,4
08 JUNE	23	N9	2530	2,4
12 JUNE	24	N9	2573	2,4

1985

13 JUNE	24	N9	2588	2,4
15 JUNE	24	N6	31015	2,4
17 JUNE	25	N9	2644	2,4
18 JUNE	25	N9	2659	2,3,4
19 JUNE	25	N6	31081	2,3,4
20 JUNE	25	N6	31095	2,4
21 JUNE	25	N6	31109	2,4
22 JUNE	25	N9	2715	2,4
22 JUNE	25	N6	31123	2,4
24 JUNE	26	N6	31153	2,4
25 JUNE	26	N9	2756	2,3,4
26 JUNE	26	N6	31180	2,4
09 JULY	28	N9	2967	1,2,3,4
26 JULY	30	N9	3165	2,4
30 JULY	31	N9	3264	2,3,4
02 AUGUST	31	N9	3293	2,4
03 AUGUST	31	N8	12213	2,4
07 AUGUST	32	N9	3363	2,3,4
07 AUGUST	32	N9	3364	2,3,4
08 AUGUST	32	N9	3378	2,4
09 AUGUST	32	N9	3392	2,4
10 AUGUST	32	N9	3406	2,4
14 AUGUST	33	N9	3463	2,4
18 AUGUST	34	N9	3519	2,4
19 AUGUST	34	N9	3533	2,4
20 AUGUST	34	N9	3546	1,2,4
20 AUGUST	34	N9	3547	1,2,4
21 AUGUST	34	N9	3561	2,3,4
22 AUGUST	34	N9	3576	2,4
23 AUGUST	34	N9	3590	2,4
24 AUGUST	34	N9	3603	2,4
25 AUGUST	35	N9	3618	2,4
11 SEPTEMBER	37	N9	3857	2,3,4
12 SEPTEMBER	37	N9	3872	2,3,4
13 SEPTEMBER	37	N9	3886	2,3,4
24 SEPTEMBER	39	N9	4040	2,3,4
26 SEPTEMBER	39	N9	4069	2,3,4
06 OCTOBER	41	N9	4210	2,4
20 OCTOBER	43	N6	32823	4
27 OCTOBER	44	N9	4501	4
07 NOVEMBER	45	N6	33080	4
08 NOVEMBER	45	N9	4676	4
16 NOVEMBER	46	N9	4784	4
20 NOVEMBER	47	N6	33274	4
25 NOVEMBER	48	N9	4915	4
04 DECEMBER	49	N6	33473	4
08 DECEMBER	50	N6	33530	4
09 DECEMBER	50	N6	33544	4
10 DECEMBER	50	N9	5127	4
11 DECEMBER	50	N9	5141	4
13 DECEMBER	50	N9	5169	4

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1985				
16 DECEMBER	51	N9	5210	4
17 DECEMBER	51	N9	5224	4
20 DECEMBER	51	N9	5262	4
21 DECEMBER	51	N9	5282	4
22 DECEMBER	52	N9	5296	4
29 DECEMBER	53	N6	33829	4
30 DECEMBER	53	N9	5410	4
31 DECEMBER	53	N9	5423	4
1986				
01 JANUARY	01	N9	5437	4
02 JANUARY	01	N6	33886	4
07 JANUARY	02	N6	33957	4
12 JANUARY	03	N9	5587	4
17 JANUARY	03	N9	5658	4
21 JANUARY	04	N9	5719	4
22 JANUARY	04	N9	5729	4
23 JANUARY	04	N9	5743	4
24 JANUARY	04	N9	5757	4
26 JANUARY	05	N9	5790	4
27 JANUARY	05	N9	5804	4
28 JANUARY	05	N9	5818	4
14 FEBRUARY	07	N9	6058	4
17 FEBRUARY	08	N9	6096	4
21 FEBRUARY	08	N9	6157	4
09 MARCH	11	N9	6377	4
12 MARCH	11	N9	6420	4
15 MARCH	11	N9	6462	4
16 MARCH	12	N9	6477	4
03 APRIL	14	N6	35182	1,4
08 APRIL	15	N9	6801	4
11 APRIL	15	N9	6848	1,4
15 APRIL	16	N9	6899	1,4
16 APRIL	16	N9	6919	1,4
18 APRIL	16	N9	6945	1,4
03 MAY	18	N9	7159	2,4
29 MAY	22	N9	7525	2,4
09 JUNE	24	N9	7680	1,2,4
18 JUNE	25	N9	7808	2,4
28 JUNE	26	N9	7948	2,4
03 SEPTEMBER	36	N9	8894	1,2,3,4
05 SEPTEMBER	36	N9	8922	1,2,3,4
06 SEPTEMBER	36	N9	8936	1,2,3,4
07 SEPTEMBER	37	N9	8950	1,2,3,4
08 SEPTEMBER	37	N9	8964	1,2,3,4

1986

10 SEPTEMBER	37	N9	8992	1,2,3,4
11 SEPTEMBER	37	N9	9006	1,2,3,4
14 SEPTEMBER	38	N9	9049	1,2,3,4

1987

03 FEBRUARY	06	N9	11052	1,2,3,4,5
25 MARCH	13	N9	11758	1,2,3,4,5
08 APRIL	15	N9	11955	1,2,3,4,5
07 MAY	19	N9	12364	1,2,3,4,5
24 MAY	22	N9	12604	1,2,3,4,5
08 JUNE	24	N9	12816	1,2,3,4,5
23 JUNE	26	N9	13027	1,2,3,4,5
08 JULY	28	N9	13239	1,2,3,4,5
16 JULY	29	N9	13352	1,2,3,4,5
28 JULY	31	N9	13521	1,2,3,4
01 AUGUST	31	N9	13578	1,2,3,4,5
02 AUGUST	32	N9	13592	1,2,3,4,5
03 AUGUST	32	N9	13606	1,2,3,4,5
11 AUGUST	33	N9	13719	1,2,3,4,5
12 AUGUST	33	N9	13733	1,2,3,4,5
13 AUGUST	33	N9	13747	1,2,3,4,5
14 AUGUST	33	N9	13761	1,2,3,4,5
15 AUGUST	33	N9	13775	1,2,3,4,5
18 AUGUST	34	N9	13818	1,2,3,4,5
06 SEPTEMBER	37	N9	14085	1,2,3,4,5
09 SEPTEMBER	37	N9	14128	1,2,3,4,5
14 OCTOBER	42	N9	14621	1,2,3,4,5
06 NOVEMBER	45	N9	14946	1,2,3,4,5

1988

29 JULY	31	N9	18699	1,2,4
10 AUGUST	33	N9	18868	1,2,4
14 AUGUST	34	N9	18925	1,2,4
17 SEPTEMBER	38	N9	19404	1,2,4
22 SEPTEMBER	39	N9	19475	1,2,4
27 SEPTEMBER	40	N9	19546	1,2,4

1989

23 FEBRUARY	08	N11	2149	1,2,4
02 MARCH	09	N11	2248	3,4,5
29 MARCH	13	N11	2629	3,4,5
16 APRIL	16	N11	2883	1,2,4
19 APRIL	16	N11	2925	1,2,4
28 APRIL	17	N11	3052	1,2,3,4
23 MAY	20	N11	3404	1,2,4
26 MAY	20	N11	3447	1,2,4
09 JUNE	22	N11	3644	1,2,4
18 JUNE	24	N11	3771	1,2,4

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1989

23 JUNE	24	N11	3842	1,2,4
28 JUNE	25	N11	3912	1,2,4
08 JULY	26	N11	4053	1,2,4
15 JULY	27	N11	4152	1,2,4
31 JULY	30	N11	4378	1,2,4
08 AUGUST	31	N11	4490	1,2,4
18 AUGUST	32	N11	4632	1,2,4
24 AUGUST	33	N11	4716	1,2,4

1990

24 APRIL	17	N11	8144	1,2,4
11 MAY	19	N11	8384	1,2,4
23 MAY	21	N11	8539	1,2,4
26 MAY	21	N11	8595	1,2,4
31 MAY	22	N11	8666	1,2,4
12 JUNE	24	N11	8835	1,2,4
28 JUNE	26	N11	9061	1,2,4
05 JULY	27	N11	9160	1,2,4
25 JULY	30	N11	9442	1,2,4
16 AUGUST	33	N11	9752	1,2,4
13 SEPTEMBER	37	N11	10148	1,2,4
10 OCTOBER	41	N11	10528	1,2,4
27 OCTOBER	43	N11	10768	1,2,4
06 NOVEMBER	45	N11	10909	1,2,4
23 NOVEMBER	47	N11	11149	1,2,4
09 DECEMBER	50	N11	11375	2,4
11 DECEMBER	50	N11	11403	4
22 DECEMBER	51	N11	11558	2,4

1991

24 JANUARY	04	N11	12024	4
11 FEBRUARY	07	N11	12278	4
18 FEBRUARY	08	N11	12377	1,2,4
22 FEBRUARY	08	N11	12433	1,2,4
05 MARCH	10	N10	23173	1,2,4
13 MARCH	11	N10	23296	1,2,4
15 MARCH	11	N10	23315	1,2,4
21 MARCH	12	N11	12814	1,2,4
24 MARCH	13	N11	12857	1,2,4
28 MARCH	13	N11	12908	1,2,4
31 MARCH	14	N11	12956	1,2,4
03 APRIL	14	N10	23586	1,2,4
07 APRIL	15	N10	23652	1,2,4
10 APRIL	15	N10	23694	1,2,4

1991

11 APRIL	15	N10	23700	1,2,4
12 APRIL	15	N10	23714	1,2,4
17 APRIL	16	N10	23795	1,2,4
19 APRIL	16	N11	13224	1,2,4
21 APRIL	17	N11	13252	1,2,4
23 APRIL	17	N11	13280	1,2,4
24 APRIL	17	N10	23894	1,2,4
25 APRIL	17	N10	23908	1,2,4
27 APRIL	17	N10	13336	1,2,4
28 APRIL	18	N10	23951	1,2,4
29 APRIL	18	N10	23965	1,2,4
30 APRIL	18	N10	23979	1,2,4
01 MAY	18	N10	23994	1,2,4
08 MAY	19	N10	24093	1,2,4
11 MAY	19	N10	24136	1,2,4
13 MAY	20	N10	24164	1,2,4
16 MAY	20	N11	13605	1,2,4
21 MAY	21	N11	13675	1,2,4
22 MAY	21	N10	24292	1,2,4
07 JUNE	23	N11	13915	1,2,4
28 JUNE	26	N11	14212	1,2,4
03 JULY	27	N11	14282	1,2,4
05 JULY	27	N11	14310	1,2,4
29 AUGUST	35	N11	15087	1,2,4