Titel:/Title:/Titre:

Holzvorratsermittlung durch digitale Luftbildauswertung

Autor(en)/Author(s)/Auteur(s):

Dr. Alparslan Akça , Inst. f. Forsteinrichtung u. Ertragskunde
Universität Göttingen

Zusammenfassung:/Abstract:/Sommaire:

Es wird die Anwendungsmöglichkeit der digitalen Luftbildauswertungsverfahren zum Zwecke der Holzvorratsermittlung dargestellt. In einem Voruntersuchung im östlichen Teil des nordwestdeutschen Tieflandes, im Kreis Lüchow-Dannenberg konnten die Bestandesmassen von Kiefernbeständen mit Hilfe der im Luftbild meß- und schätzbaren Daten ausreichend genau ermittelt werden.

Titel:/Title:/Titre: Stereosat: A Private Sector/Government Joint Venture in Remote Sensing from Space

Autor(en)/Author(s)/Auteur(s): Richard L. Anglin, Jr.

Zusammenfassung:/Abstract:/Sommaire:

Stereosat, a satellite to obtain stereoscopic images of the earth's land masses in a consistent scale, has been proposed as a joint venture between the United States Government and one or more private sector industrial corporations.

For any organizational structure, ranging from the government exercising minimum control over an all private venture to the government undertaking Stereosat and creating a mechanism for the private sector to eventually purchase the system, a number of legal, economic, political and institutional issues must be addressed. For example, the Outer Space Treaty requirement of "authorization and continuing supervision" must be resolved consistent with national and international policy. The relationship of a U.S. remote sensing venture and the international market for the data is unclear. It is also unclear whether existing international agreements are adequate to encourage private investment in a world-wide distribution network.

This paper discusses both the range of potential organizational models and some issues which will influence the eventual structure created.

Titel:/Title:/Titre:

Rechnergestützte Klassifikation von Fernerkundungsdaten durch Spektral-, Textur- und Formmerkmale

Autor(en)/Author(s)/Auteur(s):

Dipl.-Ing. B. Bargel

Zusammenfassung:/Abstract:/Sommaire:

Es werden Verfahren der Multispektral-, Textur- und Formanalyse und deren Einsatzmöglichkeiten zur automatischen Trennung unterschiedlicher Objektklassen der Land- und Forstwirtschaft sowie des Siedlungswesens beschrieben. Anhand von Beispielen werden die Verfahren des überwachten Lernens (Adaption des Klassifikators mittels der Regressionsanalyse), der automatischen Klassifikation größerer Bildbereiche sowie mögliche Nacherarbeitungsschritte erläutert.

Titel:/Title:/Titre:

Objektgesteuerte Segmentierung von Luftbildern

Autor(en)/Author(s)/Auteur(s):

U. Bausch, W.-D. Groch, W. Kestner, M. Sties

Zusammenfassung:/Abstract:/Sommaire:

siehe Anlage

In diesem Beitrag wird ein Konzept zur Segmentierung von Luftbildern und Fernerkundungsdaten in semantisch bedeutsame Einheiten vorgestellt. Viele derzeit bekannte Verfahren zur Bildsegmentierung führen dann zu fehlerhaften Ergebnissen und damit zu erhöhtem Aufwand bei der Bildinterpretation, wenn die dem Interpreten wesentlich erscheinenden Bildinhalte gegenüber anderen Inhalten nur undeutlich hervortreten.

Im vorgestellten Konzept findet die Segmentierung nur in solchen Bildteilbereichen statt, die als bedeutungsvoll erkannt wurden. Diese Teilbereiche können einerseits parallel bearbeitet werden (z.B. gleichzeitiger Ansatz der Verfahren an mehreren Stellen und in allen Teilbereichen). Andererseits ist eine sequentielle Bearbeitung erforderlich, wenn die Ergebnisse in einem Teilbereich die Bearbeitung in anderen Bereichen beeinflussen oder steuern (ergebnis- oder objektgesteuerte Vorgehensweise der Verfahren).

Das Konzept sieht die Integration des Interpreten in ein Bildinterpretationssystem vor. Der Interaktionsaufwand kann dabei groß (low cost System) oder vernachlässigbar klein sein (Interaktion zur Kontrolle und Steuerung automatischer Moduln). Das Konzept wurde als flexibles teilautomatisches System realisiert und an zahlreichen Beispielen getestet. Ergebnisse werden vorgestellt.

Titel:/Title:/Titre: Poplar Groves Acreage Estimation from LANDSAT Satellite Data

Autor(en)/Author(s)/Auteur(s): Beonio-Brocchieri Franco

Zusammenfassung:/Abstract:/Sommaire: The possibility of performing acreage estimations, over large areas of poplar groves, using LANDSAT satellite data, has been investigated. In the frame of the so-called likelihood scheme the concept of supervised classification has been adopted, although a coupled supervised unsupervised technique has been proposed to extrapolate recognition procedures to regions remote from training zones where classification methods have been defined and tested. Along the Po river, at a distance of about 50 Km one from another, three typical zones of poplar cultivation in North Italy have been chosen.
The results will be presented under the form of thermatic maps as well as performance matrices.

Titel:/Title:/Titre: Die Arbeiten der Kommission E der OEEPE
The work of Commission E of the OEEPE
Les travaux de la Commission E de l'OEEPE

Autor(en)/Author(s)/Auteur(s): Dr. J.Bernhard / Prof. Schmidt-Falkenberg

Zusammenfassung:/Abstract:/Sommaire: Die Kommission E der OEEPE befaßt sich mit der Erkennbarkeit von Objekten in Luftbildern,Luftbildreproduktionen und Luftbildumbildungen.Tätig sind zwei Arbeitsgruppen.Eine Gruppe,unter der Leitung von Prof. SCHMIDT-FALKENBERG,prüft die Möglichkeiten der Erstellung eines mathematischen Modells für die optisch-photographische Übertragungskette: Objekt - Luftbildnegativ. Die Arbeitsgruppe " Einflüsse der Reproduktionskette auf die Interpretierbarkeit von Orthophotos ", Leitung Dr.BERNHARD, führt auf experimenteller Basis (11 teilnehmende Zentren) eine vergleichende Bewertung der in Mitteleuropa angewandten Reproduktionsmethoden durch.Untersucht werden die Maßstäbe 1:5000,1:10000,1:25000 unter Heranziehung von photographischer, Lichtpaus- und Offsetverfahren).
Commission E is conserned with the perception of objects on aerial photographs, reproductions and processed images. The work is done by two groups. The group under the direction of Prof.SCHMIDT-FALKENBERG examines the possibilities of the establishment of a mathematical model of the optical-photographic chain of transfer: object - aerial negative. The group " Influences of reproduction processes on the perception of orthophoto-details "(directed by Dr.BERNHARD) completes a comperative experimental study on orthophotographic reproduction methodes commonly used in Central Europe (11 participating centres; investigated scales 1:5000,1:10000, 1:25000).

Titel:/Title:/Titre:

Large painted refernce panels for airborne multispectral scanner data

Autor(en)/Author(s)/Auteur(s):
H.-J. Boehnel, W. Fischer,
Fraunhofer-Institut für Physikalische Messtechnik, Freiburg (F.R.G.)
P. Reichert, Abteilung Luftbildmessung und -Interpretation der Universität Freiburg, Freiburg (F.R.G.)

Zusammenfassung:/Abstract:/Sommaire:

In order to calculate the spectral reflectance factor from MSS data without using reference measurements with the spectroradiometer on ground large painted reference panels (3x3 m^2 and 10x10 m^2) have been used during flights in altitudes of 300 m and 2000 m above ground. The suitability of these panels as reference standard for reflection measurements will be discussed.

Titel:/Title:/Titre: INCIDENCE DE L'EFFET D'ECHELLE SUR LE CONTENU INFORMATIONNEL DU FILM INFRAROUGE COULEURS DANS LE CAS D'ATTAQUES D'INSECTES EN FORET

Autor(en)/Author(s)/Auteur(s): P. BOISSARD, Ch. GOILLOT, J. RIOM, P. BELLUOMO

Zusammenfassung:/Abstract:/Sommaire:

La présente étude porte sur la forêt de pins maritimes des Maures-Estérel (Var, sud France) en cours d'attaque par une cochenille (*Matsucoccus Feytaudi* Duc).

On dispose d'une mission aérienne, réalisée en septembre 1971, sur film IRC. Les prises de vues ont été faites successivement à 3 échelles différentes $\frac{1}{250}$, $\frac{1}{500}$ et $\frac{1}{2500}$, sur le même site, à quelques minutes d'intervalle.

Après sélection trichromatique et numérisation, on obtient, pour chaque photographie, trois fichiers.

L'algorithme utilisé pour le traitement de ce type de données a été faite sur une parcelle voisine qui présente les mêmes attaques et où la réalité biologique est rigoureusement contrôlée au sol sur des arbres-test.

On met, ici, en oeuvre une méthode d'exploitation numérique non supervisée des données, par laquelle on analyse l'évolution des classifications obtenues en fonction de l'échelle des clichés et l'angle de visée.

Titel:/Title:/Titre: APPLICATION DE LA TELEDETECTION A L'ETUDE DE L'OCCUPATION DU SOL REQUIS PAR LES AMENAGEMENTS HYDRAULIQUES EN TUNISIE

Autor(en)/Author(s)/Auteur(s): BOUBAKER M. HEDI - Ingénieur Principal
Chef du Service de l'Aménagement Foncier
à la Direction des Grands Travaux Hydrauliques

Zusammenfassung:/Abstract:/Sommaire:

La communication proposée pour l'utilisation de la télédétection dans la collecte des informations relatives à l'occupation du sol formant les emprises requises par les aménagements hydrauliques en cours de réalisation en Tunisie, dans le cadre du Plan Directeur des Eaux du Nord .

Les résultats de ces investigations à partir de photos aériennes, de photoplans et d'orthophotoplan , ont contribué à l'évaluation préliminaire des biens fonds fonciers et de dégager les actions de transfert des activités d'exploitation agricole et d'habitat rural, à l'échelon régional.

Ces expériences constituent le fruit de ces applications dans les aménagements fonciers opérés au niveau de la libération des emprises hydrauliques avec une approche quantitative appréciable de leur couverture végétale./.

Titel:/Title:/Titre: LA CARTOGRAPHIE INFORMATISEE POUR UNE MEILLEURE MAITRISE DE L'ESPACE URBAIN.

Autor(en)/Author(s)/Auteur(s): Monsieur Robert BOURSAULT

Zusammenfassung:/Abstract:/Sommaire:

La maîtrise de l'Espace Urbain, sol et sous-sol, est une tâche considérable à assumer par les grandes villes pour gérer le présent et préserver l'avenir.

ICOREM a développé et exploite un système de cartographie informatisée qui fonctionne sur MARSEILLE (1 million d'habitants 24 000 ha) et sur ANTIBES (50 000 habitants - 2 600 ha).

La création et l'entretien de l'ensemble de données correspondant combine l'utilisation des techniques de photogrammétrie, de levés terrestres et de prise en compte de cartes existantes.

Titel:/Title:/Titre: Improving visual interpretation methods by using an interactive computer system: Some first results in creating a sequential land-use data base.

Autor(en)/Author(s)/Auteur(s): Ir. C.A. de Bruijn

Zusammenfassung:/Abstract./Sommaire:

Visual interpretation is a highly efficient way of extracting information from air photos and the human brain will not be easily beaten by the computer for this task. But visual interpretation involves more aspects than mere interpreting: results have to be recorded, then are normally to be transferred to a geometrical correct data base (e.g. a map) and may have to be processed in order to fit the requirements of the final user. For those latter aspects, a computer happens to be rather effective and it is worthwhile to see whether there are advantages in assisting a human interpreter with computer facilities.
It is assumed that photo interpretation with interactive computer support (Digitally Backed Photo interpretation) is not only much quicker, but also more reliable and accurate, due to possibilities for information feedback, real time testing on formal data correctness and completeness, and digital computing of real terrain coordinates instead of visual estimation or approximate optical transfer.

P.T.O.

At ITC, such an interactive system is actually under development at the Urban Survey Department. A first version is presently tested in a sequential land-use survey for a region in the South of the Netherlands. In the paper, some results of this testing are given together with details on the hardware configuration and developed software.

Titel:/Title:/Titre:

SOME HIGH EFFICIENCY DIGITAL TECHNIQUES FOR REMOTE SENSING DATA PROCESSING

Autor(en)/Author(s)/Auteur(s): V. Cappellini, M. Fondelli, F. Muntoni, G. Vanni

Zusammenfassung:/Abstract:/Sommaire:

Some efficient digital techniques, based on digital filtering, local space operators, data compression and pattern recognition algorithms are presented for remote sensing data processing. In particular it is described how by means of two-dimensional digital filters it is possible to perform enhancement and noise reduction on the remote sensing images, improving their quality. Further it is shown how by means of some local space operators it is possible to extract boundaries and edges to perform with pattern recognition algorithms a clear identification and classification of different image parts. Two techniques, one based on digital filtering and decimation the other on data compression algorithm, are also presented for comparison and correlation of earth maps obtained from sensors at different heights (aboard aircrafts, satellites). Applications of the above techniques are finally shown to process aircraft photos and LANDSAT images for agriculture and water resource evaluations.

Titel:/Title:/Titre:

HIGH ALTITUDE RECONNAISSANCE PHOTOGRAPHY - NEW APPLICATIONS IN NATURAL RESOURCES SURVEY AND WILDLAND RESOURCES MANAGEMENT PLANNING.

Autor(en)/Author(s)/Auteur(s): Jule A. Caylor ENTOMOLOGIST, U.S. FOREST SERVICE

Zusammenfassung:/Abstract:/Sommaire:

High altitude reconnaissance type aerial photographs have, until recently, been unavailable for use outside the security and defense communities. They are, however, extremely useful for a variety of natural resources survey and planning applications. Panoramic photos of novel format (12.7 CM x 127.0 CM) flown at an altitude of 20,000 M or higher can be used stereoscopically in the office and the field to detect and field identify objects larger than .6 M diameter. High resolution, color-infrared imagery of this type is being used currently as a data source by the United States Forest Service for timber salvage planning, vegetation damage assessment, transportation systems update, and a variety of other wildland resource problems. The principal advantages of the imagery are its high resolution and broad width of ground coverage per flight line (about 60 KM). The broad coverage is particularly advantageous for data discovery and recognition, though traditional plotting and mapping methods are not applicable because of geometric distortion inherent in panoramic imagery.

Titel:/Title:/Titre: IDEOGRAPHIC IMAGE ANALYSIS AS A BASE FOR A NEW VISUAL INTERPRETATION OF DOCUMENTS DERIVED FROM REMOTE SENSING.

Autor(en)/Author(s)/Auteur(s): DAELS Luc and ANTROP Marc

Zusammenfassung:/Abstract:/Sommaire: Altough the increasing importance of pattern recognition and computer-aided interpretation, the visual interpretation of the processed image and derived classification maps, remains the final and important step in the process of interpretation. Almost no fundamental investigations in this field have been carried out since the development of automated image processing.

The old idea of photomorphic units in the traditional photo-interpretation, and the field theory ("Gestalt-theory") of the psychology of learning form a solid basis for a new systematic methodology of the visual image interpretation, as is illustrated by some examples.

Titel:/Title:/Titre:

Map Revision Using SLAR Imagery

Autor(en)/Author(s)/Auteur(s):

Louis F. Dellwig
University of Kansas
Lawrence, Kansas 66045

and

J. V. Gardner
MARS, Inc.
Phoenix, Arizona 85008

Zusammenfassung:/Abstract:/Sommaire:

Imaging of Nigeria and Togo with SLAR provided the data required for the production of map-controlled radar mosaics at scales of 1:250,000 and 1:200,000 respectively with 95% of all control points at that scale within ±4.0 millimeters of true positions. The mosaics served as the base for the generation of new geologic and vegetation maps of Togo and parts of Nigeria. Aided by two looks, numerous geologic revisions resulted, not only with the addition of previously unknown structural features, a revision of age relationships and the refinement of unit boundaries but also with the repositioning of rock units and the reorientation of major faults. Vegetation mapping vividly demonstrated the need for sufficient overlap of lines of flight in order to provide for continuity of floral signatures throughout the map area.

ABSTRACT

CAPABILITIES OF HIGH ALTITUDE PANORAMIC PHOTOGRAPHY FOR MOUNTAIN PINE BEETLE DAMAGE SURVEYS

R. D. Dillman
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The United States Department of Agriculture, Forest Service, through its Nationwide Forestry Applications Program, is investigating the potential of high altitude panoramic photography to improve the efficiency of statewide mountain pine beetle (Dendroctonus ponderosae Hopkins) damage surveys.

The investigations conducted to date have concentrated in three areas: evaluation of camera and film characteristics, developing survey procedures which use the photography as a sampling base, and testing the survey procedures.

The Itek optical bar panoramic camera (KA-80A) is the primary sensor being evaluated. One frame of imagery covers an area of about 204 square kilometers with a ground resolution of 50 centimeters for high contrast targets.

The evaluation of the KA-80A imagery for the classification of dead trees, resulted in the following conclusions: color infrared film was interpreted most consistently by photointerpreters regardless of experience level; experienced photointerpreters did equally well with either monoscopic or stereoscopic viewing and; the correlation coefficient (r) between dead trees counted on the photography and those counted on the ground is .8, with twice as many trees being counted on the ground.

A survey design, using 3 stage sampling with probability proportion to size for each stage, was developed and tested in a study in the Black Hills National Forest, South Dakota. Based on the successful results of the design test, a pilot test of the new inventory procedures was conducted in a 22,258 square kilometers portion of the State of Colorado. The results of the new survey compare favorably with those from a conventional survey.

The high altitude KA-80A panoramic photography is a realistic alternative to the conventional survey techniques and offers the advantage of total area coverage and a potential for increased survey efficiency.

Titel:/Title:/Titre:

Zum Einfluß der Phänologie bei der Fernerkundung von land- und forstwirtschaftlichen Vegetationsflächen.

Autor(en)/Author(s)/Auteur(s):

Hans-Joachim Dörfel

Zusammenfassung:/Abstract:/Sommaire:

Im allgemeinen Teil wird ein Überblick über die bei der Fernerkundung von Vegetationsflächen zu erwartenden phänologischen Einflüsse gegeben.Dies wird dann an Hand ausgewählter Beispiele aus Land-und Forstwirtschaft erläutert.Dabei wird sowohl auf Luftbildaufzeichnungen als auch auf Scanner-Aufzeichnungen eingegangen.Diskutiert wird abschließend die Möglichkeit erweiterter fernerkundlicher Differenzierung von Vegetationsflächen unter Ausnutzung phänologischer Aspekte.

Titel:/Title:/Titre:

Industrielle Umweltuntersuchung nach einem mit photogrammetrischen und Fernerkennungsmethoden kombinierten Verfahren

Autor(en)/Author(s)/Auteur(s):

Frau Maria Domokos

Zusammenfassung:/Abstract:/Sommaire:

In der Abhandlung wird die Methode der mit photogrammetrischen und thermogrammetrischen Verfahren kombinierten, komplexen Umweltuntersuchung dargelegt.

Technologie und Erfahrungen der nach dieser Methodik durchgeführten Untersuchungen werden im Falle von Aufgaben folgender Art gezeigt:

-- Verunreinigung der lebenden Gewässer in der Umgebung eines Wärmekraftwerkes
-- allgemeine Verunreinigung in der Umgebung eines Tonerdenbetriebs
-- Umweltprüfungen in der Umgebung eines Chemiebetriebes

Titel:/Title:/Titre: EARTH ORBITING REMOTE SENSOR SYSTEMS FOR THE 1980s

Autor(en)/Author(s)/Auteur(s): Frederick J. Doyle

Zusammenfassung:/Abstract:/Sommaire: Landsat-D will carry a new multispectral scanner, the Thematic Mapper. Proposals have been made to NASA for other electro-optical systems, Stereosat and Mapsat. The French government is developing the SPOT multispectral system and the European Space Administration is considering both a Land Applications Satellite System (LASS) and a Coastal Ocean Monitoring Satellite (COMS). Japan will develop both land and ocean monitoring systems and People's Republic of China plans an active program. Photographic cameras and imaging radar systems are being developed for both the ESA Spacelab and the NASA Shuttle.

Titel:/Title:/Titre:
Geologic Interpretation From Seasat-A Radar Imagery of Part of the Atlantic Coastal Plain and Appalachian Mountains, U.S.A.

Autor(en)/Author(s)/Auteur(s):
Ben Drake and Steven Jackson

Zusammenfassung:/Abstract:/Sommaire:
Radar transparencies were photo interpreted to determine: (1) What types of regional and local geologic features can be mapped from the imagery, and (2) the major radar-return parameters and land use/cover types influencing the detection of the various features. Parts of the coastal plain and several geomorphic provinces of the Appalachian Mountains were studied. Major geomorphic features within the provinces can be clearly delineated on the imagery. Structures that can be mapped include plunging folds, faults, a faulted basin, and lineaments. Locally, radar stratigraphic units can be mapped in the folds. The detection of a geomorphic or structural feature or a radar stratigraphic unit is mainly determined by its surface roughness (determined by vegetative cover or amount of erosion), angle of slope, and the orientation of a slope relative to the radar look direction. Differing vegetation types, drainage patterns, and land use/cover patterns aided in discriminating the features.

Titel:/Title:/Titre:

Multispectral Image Classification in Remote Sensing: The Class-Boundaries Approach.

Autor(en)/Author(s)/Auteur(s):

Sebastian Ekenobi

Zusammenfassung:/Abstract:/Sommaire:

The classifications are on the basis of a simulated scene with assumed reflectance properties. Various classification algorithms are tested by data sampled in various ways. These findings are compared with those of a real Landsat scene.

Titel:/Title:/Titre: Dimensions of Urban Features Relative to Pixel Sizes Planned for Landsat D and the Multispectral Resources Scanner

Poster Session Requested

Autor(en)/Author(s)/Auteur(s):

Richard A. Ellefsen and Duilio Peruzzi

Zusammenfassung:/Abstract:/Sommaire: The discreteness of results obtained from interpretation of the high spatial resolution satellite digital data expected from Landsat D (30 meter spatial resulution) and the Multispectral Resources Scanner (15 meter spatial resolution) will depend on how the dimensions and shapes of urban features relate to planned pixel size. In this study, several samples of urban features from varying cities throughout the world have been measured to learn to what degree they would be able to be identified by users of Landsat D and MRS digital data. These features have been placed into generic classes according to their sizes and shapes. New, outlying commercial areas, in one example, are markedly different than are those located in old central city areas. In another, multiple family residential units are classified in accordance with rooftop area and then compared to the two anticipated pixel sizes.

Titel:/Title:/Titre: Verwendung von Infrarotfarbbildern zur Ermittlung der Ausbreitungsbereiche der SO_2 Immissionsbelastung und die Feststellung der Wirkung auf das Wachstum der Fichtenbestände. (Mischwaldbestände)

Autor(en)/Author(s)/Auteur(s): Dr. Kadir ERDİN

Zusammenfassung:/Abstract:/Sommaire: Durch die Verwendung von Infrarotfarbbildern wurde versucht, die Ausbreitungsgrenze der SO_2 Immisionsbelastung auf die Mischwaldbestände, die am Rande eines Kupferwerks in Nordostanatolien (Murgul) liegen, zu ermitteln.

Ausserdem wurde versucht, die Bezichung zwischen der Rauchgasmenge und dem Zuwachsrückgang festzustellen Zu diesen Zweck wurden die Bohrkerne verwendet, die von den kranken und ausgestorbenen Bäumen herausgenommen worden sind.

Titel:/Title:/Titre:

Monitoring Structural Displacement by Photogrammetric Methods

Autor(en)/Author(s)/Auteur(s):

John P. Erlandson

Zusammenfassung:/Abstract:/Sommaire:

During the past six years, the Seattle District, Corps of Engineers has been using photogrammetry to monitor deformation in bridges, buildings, and slide areas. The procedure, including a computation process developed by the district, has proved to be a rapid and cost effective alternative to conventional field surveys. The method consists of photographing the structures at periodic intervals, with either terrestrial or aerial photography, and precisely measuring the photographic coordinates of permanently installed targets. Computed ground coordinates for the targets are then compared to the previous or base measurement for possible movement in the structure. This paper describes method and technique used to measure two slide areas, one using terrestrial photography and the other aerial photography.

Titel:/Title:/Titre: THE USE OF LANDSAT IMAGERIES IN SMALL-SCALE MAPPING

Autor(en)/Author(s)/Auteur(s): E.Franssila
J.Peltola
T.Sarjakoski

Zusammenfassung:/Abstract:/Sommaire:

Methods and programs have been researched and developed to use digital Landsat imageries in small-scale mapping (1:400 000 and smaller). This work has been done in the Technical Research Centre of Finland in co-operation with the National Board of Survey.

The two main results during 1979 are reported, first, the so-called generalization program (reclassification program) to generalize classification maps and to produce contour lines, second, the classification results of the main classes of Finnish terrain.

Titel:/Title:/Titre:

REMOTE SENSING FOR OCEANOGRAPHY

Autor(en)/Author(s)/Auteur(s).

R. Frassetto

Zusammenfassung:/Abstract:/Sommaire.

Research planes and the first generation of experimental marine satellites have demonstrated the potentials of R.S. to furnish oceanographers with the missing synoptic information over the large scales of the world ocean.

A new era may begin in the 90's with an application and use of R.S. as a tool, together with mathematical models, to observe, monitor and simulate ocean phenomena and improve forecasts of weather or climate effects on human properties, exploitations and activities.

This will be possible if an intense scientific and technical research will take place to bring experimental R.S. technique to a more operative and practical use within this decade.

The products of scientific interest of each presently experimented sensor, the promising developments, and some drawbacks in data acquisition, preprocessing and processing and the goals which oceanographers should reach are reviewed.

Titel:/Title:/Titre:

REMOTE SENSING DATA FOR REGIONAL PLANNING IN ITALY.

Autor(en)/Author(s)/Auteur(s):

RICCARDO GALETTO – PAOLO RIGANONTI

Zusammenfassung:/Abstract:/Sommaire:

The paper deals with the first results of a research granted by the Italian Research Council (CNR) for testing the possibility to use remote sensing tecniques for acquisition of useful data for regional planning.

Thereafter, the results of experience performed by means of Landsat derived thematic maps are presented and discussed.

Titel:/Title:/Titre:

A methodology for a large scale olive trees inventory.

Autor(en)/Author(s)/Auteur(s): G. FRAYSSE, P. MONTELLANICO

Zusammenfassung:/Abstract:/Sommaire: In order to establish a methodology for the determination of olive trees area and number in cadaster parcels, several methods were compared : black-and-white aerophotography, color infra-red aerophotography, multispectral scanner imagery. Human photointerpretation, automatic processing were applied to the main categories of olive trees fields. The results of these experiments are presented and the sources of errors are analyzed

Titel:/Title:/Titre:

Stereosat: A Global Digital Stereo Imaging Mission.

Autor(en)/Author(s)/Auteur(s):

Alexander F. H. Goetz, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91103, USA

Zusammenfassung:/Abstract:/Sommaire:

During the last four years a global stereo imaging mission has been under study by NASA-JPL. The requirement for stereo images stems mainly from the resource exploration sector. This group has learned the value of the synoptic view from orbit through use of Landsat data, but has felt that many times more information is available by the use of stereo.

The objectives of the Stereosat mission are to (1) Obtain world-wide, cloud-free stereo coverage at two base-height ratios and with a ground IFOV of 15 m. (2) Obtain stereo data in digital form that can be merged with monoscopic Landsat multispectral data. (3) Develop the potential for the production of digital terrain models directly from the image data stream. The proposed implementation of these objectives and the technical ramifications are the subject of the presentation.

Titel:/Title:/Titre:

Geological Spectroscopy and Its Practical Application to Lithologic Identification.

Autor(en)/Author(s)/Auteur(s):

Alexander F. H. Goetz, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California 91103, USA

Zusammenfassung:/Abstract:/Sommaire:

Landsat MSS data has provided the first extensive test of the use of spectral information for rock and soil identification. Although some success has been obtained in discriminating or separating different rock units, no direct identification of materials based on spectral reflectance has been possible except for limonite.

Thousands of spectra in the 0.4 - 2.5 μm region have been obtained using portable field equipment. These spectra have been analyzed by statistical means to determine which wavelength bands will prove most useful for future imaging systems. Wavelengths greater than 1 μm invariably result in better discrimination.

Higher resolution spectroscopy ($\Delta\lambda/\lambda$) ≃ 200 shows that the region 2 - 2.5 μm contains highly diagnostic information on clays and carbonates. An instrument called the Shuttle Multispectral Infrared Radiometer (SMIRR) has been built to fly on the second flight of Shuttle and collect data world-wide to test the value of ten spectral channels in the reflective IR.

Titel:/Title:/Titre:

Erkennung von Pflanzenschutzmaßnahmen, Düngeeffekten und Ertragsmessungen hoher Genauigkeit aus Luftbildern.

Autor(en)/Author(s)/Auteur(s):

Horst Helbig

Zusammenfassung:/Abstract:/Sommaire:

In Zusammenarbeit mit der BASF wurden Luftbilder von Versuchsfeldern mit Hilfe digitaler Bildverarbeitungsverfahren ausgewertet. Die aus den Bildern ermittelten Werte zeigen eine hohe Korrelation (bis R=o,98) mit den auf den Feldern am Boden durchgeführten Maßnahmen für Düngung und Pflanzenschutz und den erzielten Ernteerträgen. Notwendig für eine hohe Genauigkeit ist eine vorausgehende radiometrische Korrektur, die ohne zusätzliche Hilfsmittel aus den Bildern ermittelt wird.

Titel:/Title:/Titre:

Radiometrische Korrektur und Filterung von OCS-Daten zur Verbesserung der Auswertung.

Autor(en)/Author(s)/Auteur(s):

H. Helbig, H.van der Piepen

Zusammenfassung:/Abstract:/Sommaire:

Daten von einem OCS-Flugexperiment über der Deutschen Bucht zeigen nur geringe Signalamplituden. Störungen bei großen Winkelablenkungen und Scanfehler beeinträchtigen stark die Auswertung und Klassifizierung der Aufnahmen.
Einige Verfahren zur radiometrischen Korrektur und Filterung wurden im Rahmen des DIBIAS-Bildauswertesystem entwickelt und ihre Wirksamkeit an den Daten erprobt. Klassifizierungsergebnisse werden verbessert.

Titel:/Title:/Titre: *INTERNATIONAL GEOLOGICAL AND GEOPHYSICAL REMOTE SENSING FROM SPACE*

Autor(en)/Author(s)/Auteur(s): *Frederick B. Henderson, III, Ph.D.*

Zusammenfassung:/Abstract:/Sommaire: *The Geosat Committee was organized to recommend Landsat supplementary sensing systems optimizing geological remote sensing from space. The recommendations include rock/soil sensitive spectral bands, worldwide, high resolution film (Large Format Camera); Landsat-compatible stereoscopic digital imaging data (STEREOSAT); and synthetic aperture radar. Potential space remote sensing systems are being evaluated under the joint JPL/NASA-Geosat Test Case Program. The study includes an evaluation of sensors, data processing techniques and interpretation methods in 3 oil and gas, 3 porphyry copper and 2 uranium sites. The Geosat Committee recommendations are influenced by recent national and international developments; the 1979 Space Policy; OSTP studies on military/civilian remote sensing systems integration and private sector involvement; Presidential Directive 54; Senate and House action in 1978, 1979 and 1980 on space policy and the development of an operational earth remote sensing system; the activities of Comsat on STEREOSAT development. Some Geosat recommended data may become available through France's SPOT, Japan's MOS/LOS, Germany's ARGUS and other non-US earth remote sensing satellites. Geosat hopes these systems will be Landsat-compatible.*

Titel:/Title:/Titre: Results of the Canadian Surveillance Satellite Sea Ice Experiment

Autor(en)/Author(s)/Auteur(s): H. Hengeveld, Atmospheric Environment Service
C. Livingstone, Canada Centre for Remote Sensing
R. Lowry, Intera
R.O. Ramseier, Atmospheric Environment Service

Zusammenfassung:/Abstract:/Sommaire: During the SURSAT sea ice experiment dedicated profiling sensor flight lines were flown in both the Beaufort Sea and the Davies Strait sorties to collect spatially and temporally coherent 19.35 GHz horizontally polarized radiometer data, 13.3 GHz dual polarized fan beam scatterometer data and mapping camera photography of sea ice. These data have been analyzed to determine the quantitative microwave signatures for WMO sea ice classes found under winter, early spring and spring marginal ice zone conditions. Results show that 11 sea ice types may be uniquely identified from their active and passive microwave signatures for the sea ice conditions found in this experiment. The effect of changing incidence angles on the characteristics of radar imagery of sea ice taken in the Beaufort Sea with SLAR, SAR and SEASAT-1 SAR are examined. Based on the SURSAT experiment an integrated ice reconnaissance system is proposed which makes use of surface, airborne and spaceborne deployed active and passive microwave sensors.

Titel:/Title:/Titre: Spectral Signatures of Forest Objects

Autor(en)/Author(s)/Auteur(s): G. Hildebrandt, H.J. Boehnel, P. Reichert

Zusammenfassung:/Abstract:/Sommaire:

A summarized report on spectral signatures of forest stands based on results of in-situ- and airborne spectroradiometric measurements. The methods of measurement, their physical background and the most characteristic behaviour of the spectral reflectance of forest objects will be explained. Special emphasis will be applied to the variations of the spectral signatures of the same object and to the factors which cause these varations.

Titel:/Title:/Titre: THE REGIONAL CENTRE FOR TRAINING IN AERIAL SURVEYS, ILE-IFE, NIGERIA (UNDER THE AUSPICES OF THE UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA)

Autor(en)/Author(s)/Auteur(s): DOCTOR SIMEON OMELIHU IHEMADU
(DIRECTOR OF ABOVE-NAMED CENTRE)

Zusammenfassung:/Abstract:/Sommaire:

The paper traces the history of the Regional Centre for Training in Aerial Surveys, Ile-Ife, Nigeria, highlighting the Centre's objectives with respect to training, research and provision of consultancy services in aerial surveying, and indicating the administrative set-up, the continental geographical spread of admission of students, the bilingual status of the Centre, sources of financial support, and the present and prospective courses.

The Centre's achievements so far, the paper reveals, include the successful training of 109 Photogrammetric Technicians from 19 African Countries and 27 Photogrammetric Operators from 9 African Countries, representing a success score of 97% of total in-take of students.

Titel:/Title:/Titre:

Anwendung von Fernerkundungsmethoden für ökologische Kartierungen auf europäischer Ebene

Autor(en)/Author(s)/Auteur(s):
JASKOLLA,F. - Zentralstelle für Geophotogrammetrie u.Fernerkundung d.DFG München
MÖSSMER,R. - Lehrstuhl für Landschaftstechnik der Universität München

Zusammenfassung:/Abstract:/Sommaire:
Für das Gebiet der Europäischen Gemeinschaft wird derzeit eine Methode der ökologischen Kartierung entwickelt, dessen erste Phase den Aufbau eines Informationssystems erfordert. Die dafür definierten ökologischen Umweltindikatoren sind aber in den europäischen Ländern sehr unterschiedlich verfügbar.

Es wurde daher untersucht, inwieweit Methoden der Fernerkundung für ökologische Kartierungen auf europäischer Ebene Anwendung finden können. An Hand von 4 repräsentativen Testgebieten in Europa wurde folgenden Fragenkomplexen nachgegangen:

a) welche Anforderungen ergeben sich aus der Sicht einer ökologischen Kartierung auf europäischer Ebene

b) mit welchen operationell anwendbaren Verfahren der Fernerkundung können welche Indikatoren erfaßt bzw. aktuell gehalten werden, differenziert nach den regionalen Verhältnissen.

Titel:/Title:/Titre: REMOTE SENSING OF NATURAL RESOURSES IN THE USSR

Autor(en)/Author(s)/Auteur(s): Kashin L.A., Kienko Yu.P.

Zusammenfassung:/Abstract:/Sommaire: A vast program of natural resourses exploration by space and arial remote sensors is carried out in the Soviet Union.

The territory of the USSR is surveyed from "Salut" manned space stations, "Sojuz" space ships, "Meteor" and "Cosmos" automatic space apparatuses, as well as from AN-30 airborn laboratories.

The utilization of remote sensing data provides important scientific and practical results in the field of mineral resourses exploration, forestry, shelf exploration etc.

Titel:/Title:/Titre: **Luftbildinterpretation von Straßenbäumen in westdeutschen Städten.**

- Technische und wirtschaftliche Voraussetzungen für eine operationelle Anwendung -

Autor(en)/Author(s)/Auteur(s):

Dr. H. Kenneweg

Zusammenfassung:/Abstract:/Sommaire:

Nach allgemeinen Empfehlungen für die Herstellung und Auswertung der Luftbilder werden Erfahrungen aus westdeutschen Städten beschrieben. Aus Ergebnissen einer Umfrage lassen sich Voraussetzungen für die Wirtschaftlichkeit derartiger Inventuren definieren. Gesamtübersichten der Interpretationsergebnisse erlauben nicht nur Rückschlüsse über den Vitalitätszustand des Baumbestandes mit vielen Details, sondern können auch Hinweise auf Veränderungen und Entwicklungstendenzen geben.

Titel:/Title:/Titre:

Contribution à l'étude des sols nus par microondes

Autor(en)/Author(s)/Auteur(s): Mrs Dr C. KING.

Zusammenfassung:/Abstract:/Sommaire:

Le texte est agrafé à ce formulaire.

CONTRIBUTION A L'ETUDE DES SOLS NUS PAR MICROONDES

Dr. C. KING - Laboratoire de Pédologie

Institut National Agronomique Paris - Grignon

FRANCE

Ce travail a consisté en l'observation du comportement du signal microondes, dans des conditions précises d'observation sur sol nu, à une altitude très basse (15 m) et avec une bonne connaissance de la zone étudiée.

Il a été réalisé en collaboration avec le Centre d'Etudes Spatiales des Rayonnements, grâce au Centre National d'Etudes Spatiales réalisateur du scattéromètre RAMSES à 4 fréquences (1.5, 3, 4.5, 9 GHz) et à 4 combinaisons de polarisation.

Deux campagnes de mesures se sont déroulées sur le site de Grignon (I.N.A. P-G.) de Mars à Mai en 1978 et 1979. Elles concernent l'enregistrement des valeurs de signaux rétrodiffusés aux incidences de 20° à 70° pour toutes les configurations possibles. Il y a eu en tout 120 séries de mesures.

Deux type de paramètres ont été appréciés sur le terrain :

- l'humidité de la couche superficielle du sol (0 - 40 cm) mesurée par la méthode pondérale ;
- la rugosité de la surface échantillonnée par une méthode microtopographique (CLEMENTINA) et un traitement numérique approprié.

L'ensemble des données recueillies a permis d'établir des relations monofactorielles entre le signal rétrodiffusé et les paramètres de terrain.

- En 1978, la comparaison de σo selon différents états de rugosité du sol montre que le signal augmente avec la rugosité pour un état d'humidité donné, sauf à 4.5 GHz où le signal est insensible aux variations de rugosité.

- En 1978 et 1979 l'influence de l'humidité de surface sur σo a aussi pu être étudiée, pour une gamme allant de 3 à 30 % (humidité pondérale). σo augmente avec la teneur en eau. L'augmentation a été évaluée par la méthode des corrélations linéaires à 0,3 dB par pour cent d'humidité quelle que soient les fréquences utilisées.

Ces résultats permettent de préciser les espoirs fondés sur l'utilisation des radars aéroportés qui pourront fournir rapidement des informations concernant la cartographie des caractères hydriques des sols et le suivi temporel de leurs conditions d'humidité.

Titel:/Title:/Titre:

The potential use of remotely sensed data for regional and zonal planning

Autor(en)/Author(s)/Auteur(s):

Kirchhof, W. ; Lütrow, G. .

Zusammenfassung:/Abstract:/Sommaire:

this paper is intended to draw the attention to possibilities and limitations of remote sensing for regional and zonal planning.
For specific applications satellite and airborne multispectral scanner data were investigated. By computer aided analysis information relevant to regional and zonal planning could be identified and extracted.
Results will be presented and discussed with an outlook to information systems.

Titel:/Title:/Titre:

Separability of spectral signatures and the feasibility of forest type classification using multidate M^2S data - a case study

Autor(en)/Author(s)/Auteur(s):

G. Kritikos, P. Reichert, P.S. Roy and V. Parthasarathi

Zusammenfassung:/Abstract:/Sommaire:

The study envisages the analysis of spectral behaviour of different forest cover types and the possibility of their classification using M^2S data available for three different months in 1976. The spectral separability studies have been undertaken on original and enhanced data to evaluate the effect of variation in three different months and also the possibility of applying preprocessing techniques for improved classification. Finally, the supervised maximum likelihood classification has been done in all bands and also for the four selected bands.

Titel:/Title:/Titre:

Interpretation of Vegetation Resources with Merged RBV/MSS Digital Landsat Data

Autor(en)/Author(s)/Auteur(s):

Donald T. Lauer, U.S. Geological Survey
Dale G. Gehring, Technicolor Graphics Services, Inc.
Lincoln Perry, Technicolor Graphics Services, Inc.

Zusammenfassung:/Abstract:/Sommaire:

Landsat 3 data have been digitally processed and displayed to maximize the interpretability of vegetation resources. An area within an annual grassland/mixed hardwood forest vegetation cover type adjacent to San Francisco, California in the California Coast Range was selected for study. Landsat Multispectral Scanner (MSS) and Return Beam Vidicon (RBV) data, with approximately 80 meter and 40 meter pixel resolution, respectively, were digitally merged and normalized for optimum detail and color. The resultant image shows improved sharpness without sacrificing spectral information. The merged data allow a trained analyst to make improved interpretations of forest structure (crown density), canopy texture (tree stocking) and cover type boundaries (plant distribution) when compared to interpretations made with either MSS or RBV data analyzed separately. Furthermore, the confidence, speed and efficiency of the interpreter is increased when working with merged data.

Titel:/Title:/Titre: Aerial data in forecasting of urban development and traffic in Tripoli

Autor(en)/Author(s)/Auteur(s): Harri Leppänen

Zusammenfassung:/Abstract:/Sommaire:

1) Definition of actual population 1977
   Estimation of actual population on basis of population census 1973 and aerial photographs 1973 and 1977.
2) Definition of employment 1977
   Estimation of number of jobs by activity and city zone using employment statistics and photo-interpretation data.
3) Forecasting of population 2005
   Estimation of future population by city zone using monitored urban densities and development potentials.
4) Forecasting of employment 2005
   Forecasting of number of jobs by activity and city zone.
5) Traffic model calibration
   Photo-interpretation-based land-use data in calibration of traffic survey based traffic models.

Titel:/Title:/Titre: NEW FAST CLUSTERING TECHNIQUE TO PRODUCE THEMATIC MAPS OF MULTISPECTRAL DATA

Autor(en)/Author(s)/Auteur(s): DR. GABRIEL E. LOWITZ

Zusammenfassung:/Abstract:/Sommaire: This paper presents a novel and computationally efficient strategy to achieve data clustering directly on histograms without iteration.

The incoming raw multichannel data can be first reduced to its two principal (Karhunen-Loeve) componets to augment the weight of the statistical evidence, the histogram of which is then partitionned in non overlopping radiometry domains after detection of the centers and separatrices of the underlying distributions. The novelty consists of the extraction of the self information, the detection of the underlying distribution and the required filtering by a Fourier transform of the histogram itself considered as an information carrying signal. This methodolgy is first explained in simple terms using the vocabulary of signal detection. This methology is later refined using a model based on Slepian and Al's Prolate Spheroidal Wave Functions.

Experimental results of this optimum unsupervised classification applied to image processing are given to illustrate the clustering performances and the excellent overall computational efficiency.

Titel:/Title:/Titre: Interprétation de l'évolution de la réflectance d'un couvert de blé durant la phase de maturation : liaison avec l'état physiologique

Autor(en)/Author(s)/Auteur(s): MALET P., GUYOT G., GURNADE J.C., BARET F.

Zusammenfassung:/Abstract:/Sommaire: Une étude a été entreprise pour tenter de fournir une interprétation biologique au phénomène de décroissance de l'indice de végétation $VI\ 7 = \frac{R_7 - R_5}{R_7 + R_5}$ (déterminé à partir de mesures radiométriques dans les bandes 5 et 7 de Landsat) au cours de la phase de maturation du blé , mis en évidence par IDSO et al (1978-1979).

Les mesures biologiques effectuées ont montré que la période de décroissance de VI 7 coïncide avec la phase au cours de laquelle s'effectue la migration des réserves des tiges et des feuilles vers le grain. Durant cette phase particulière de sa vie, le blé est très sensible aux températures élevées et au déficit hydrique. Ces facteurs climatiques peuvent réduire la durée de cette période et bloquer les migrations, entraînant ainsi une baisse de production.

Ainsi, le suivi dans le temps de VI7 doit permettre, d'une part de classer les différentes variétés en fonction de leur précocité dans un lieu donné, d'autre part, d'avoir une information sur la production potentielle. Toutefois la relation qui peut être établie entre le rendement et la vitesse de décroissance de VI7 n'a qu'une valeur locale et ne peut pas être généralisée à de vastes régions.

Titel:/Title:/Titre: Changements de structure d'un couvert de blé, liés à la phénologie et la croissance : conséquences sur la réflectance

Autor(en)/Author(s)/Auteur(s): MALET P., GURNADE J.C., GUYOT G., HUET M.

Zusammenfassung:/Abstract:/Sommaire:
L'étude des propriétés optiques des feuilles a permis de constater que celles-ci restaient pratiquement constantes durant la majeure partie de la vie de la plante. Elles n'évoluent que durant la phase de sénescence. En dehors de celle-ci, l'évolution des propriétés optiques du couvert végétal est donc essentiellement due à l'évolution de la structure géométrique du couvert.

Une série de mesures a été effectuée pour tenter de déterminer les relations existant entre l'état physiologique ou le stade de développement et la structure de différents couverts de blé.

Les résultats obtenus ont permis de mettre en évidence l'existence de changements significatifs de structure du couvert correspondant à des stades phénologiques particuliers (en particulier début et fin de la phase de maturation). Par ailleurs, l'introduction des données de structure receuillies dans les modèles de réflectance permet d'expliquer l'évolution des données de réflectance mesurées simultanément.

Titel:/Title:/Titre: YIELD ESTIMATIVES FOR CORN CROP THROUGH THE COLORED INFRARED FILM

Autor(en)/Author(s)/Auteur(s): DELMAR MARCHETTI
GILBERTO J. GARCIA

Zusammenfassung:/Abstract:/Sommaire: The traditional system of yield forecasting utilizes tachnical reports from different resources. The collecting of information starts before the planting period and the estimatives are adjusted during the development of the cultures. The present work, intends to show the possibilities of the color infrared film in the yield forecasting of corn. The quantitative information was obtained through the transmission density. The six trials consisted of different manure quantities, with probable yield differences. The culture was photographed with color film (Kodak Ektachrome 64 ASA) and color infrared film (Kodak Ektachrome Infrared Film) and the optical density was measured with a transmission microdensitometer, Weston, model 877 with an aperture of 0,8mm. The interation between Yield and Optical Density was analysed through correlation and linear regression. The analysis of the results led to the following main conclusions: a) alter calibrations, the color infrared film, can be used in the yield forecasting of corn; b) the quantitative interpretation of the results, through transmission density, suggests apllication of this method in other types of cultures.

Titel:/Title:/Titre: Registration and use of HCMM day and night thermal data to obtain soil moisture and evaporation

Autor(en)/Author(s)/Auteur(s): Mégier Jacques, Dejace Jules

Zusammenfassung:/Abstract:/Sommaire: The determination of thermal inertia, soil moisture and evaporation by starting from HCMM thermal data requires that the day and night data be registered with an accuracy compatible with the local variation of the ground temperature. The present work uses HCMM data acquired during consecutive night and day passages in 1978 and 1979 over the Crau region situated to the east of the Rhône delta (France). The registration is done by chosing ground control points as close as possible to the studied area,using bivariate polynomials as a geometric transformation and resampling the transformed image by cubic convolution. After correction for atmospheric effect and calibration with ground temperature measurements, thermal inertia, soil moisture and cumulated evaporation are determined and mapped pixel by pixel by using the "Tell-us" model, which is a reverse temperature simulation process.

Titel:/Title:/Titre: Feature Extraction on Seasat SAR Imagery

Autor(en)/Author(s)/Auteur(s): W. Mehl

Zusammenfassung:/Abstract:/Sommaire: SAR Imagery is characterized by high resolution but also by a grainy structure (Speckle) due to the coherent radiation imaging process. From small rectangle subareas of SAR images, some statistical parameters varying less than the Speckle pattern may be extracted. On the multichannel image with coarser resolution obtained by extracting such parameters, automatic classification and image analysis methods can be applied. The performance of that approach of Seasat SAR data is discussed.

Titel:/Title:/Titre:

Environmental Studies by Pattern Classification for evaluating the Effect of Civil Engineering Projects under Construction

Autor(en)/Author(s)/Auteur(s):

Taichi OSHIMA

Zusammenfassung:/Abstract:/Sommaire:

In constructing large civil engineering projects, environmental studies before, during and after its construction are required from both natural and human side and their scientific approaches are now being studied systematically and economically from the point of pattern classification using computer analysis.

This paper discusses on the fundamental environmental studies by means of photographic informations such as natural color, infrared color, multi-photos and thermal images and how evaluate their elements relating to the construction of civil engineering projects of actual examples as a system.

Titel:/Title:/Titre: SIGNIFICATION DU CONCEPT D'INERTIE THERMIQUE POUR DIVERSES SURFACES NATURELLES, SOLS OU COUVERTURES VEGETALES

Autor(en)/Author(s)/Auteur(s): A. PERRIER, Ch. GOILLOT, P. BOISSARD, P. VALERY, P. BELLUOMO

SOMMAIRE : Dans la perspective d'appliquer le concept d'"inertie thermique" à des sols qui présentent ou non différents états de couverture végétale, on étudie les histogrammes de répartition des valeurs de ΔT : différence des températures radiométriques jour-nuit mesurées par un scanneur aéroporté et comparées pixel à pixel.

L'étude porte sur un site-test en Beauce (sud de Paris), plaine céréalière à grand parcellaire. On dispose de données dans le visible (0,5-1,1µm) et l'infrarouge thermique (8-14µm) provenant d'une campagne d'acquisition effectuée fin septembre en deux vols, l'un à midi et l'autre à minuit, 12h plus tard (résolution au sol 4 x 4m).

Après calibration des données, on évalue d'abord l'effet de l'inclinaison du cone élémentaire d'analyse sur la réponse thermique d'une culture et d'un sol nu. Puis, on compare pour plusieurs cultures, sur une partie de la surface analysée, le ΔT de quelques parcelles prises individuellement au ΔT de l'ensemble des parcelles afin d'apprécier la dispersion des mesures.

On présente une approche par le bilan d'énergie afin de discuter les résultats obtenus en fonction des différents types de surface. Enfin, on montre comment une classification basée sur la discrimination du ΔT permet de généraliser à l'ensemble des surfaces les principales classes d'occupation du sol.

Titel:/Title:/Titre: The size of the net residential area on air photos as input for population and housing estimates in large cities from the developing countries

Autor(en)/Author(s)/Auteur(s): Drs. V.F.L. Pollé

Zusammenfassung:/Abstract./Sommaire:
The technique of measuring the size of the net residential area, as an alternative to counting houses on air photos, is described in this article. It is explained why this alternative is useful in the situation of mass housing in the large cities in developing countries.
The choice of a particular definition of net residential area, suitable for air-photo interpretation, is analysed for its methodological consequences. Experiments, done to establish the accuracy of the data that can be derived from air photos with this technique are analysed with respect to two aspects. Firstly, in terms of interpreter behaviour, interpreter ability, training requirements, and accuracy that can be reached. Secondly, in terms of applicability in surveys for estimating population sizes and housing stocks.

Titel:/Title:/Titre: The Dependence of the Spectral Signature of Sugar Beets on the Level of Observation and the Reflection Geometry Part C: Signature Measurements with an Airborne Multispectral Scanner

Autor(en)/Author(s)/Auteur(s):
P. Reichert
Abteilung Luftbildmessung, Universität Freiburg

Zusammenfassung:/Abstract:/Sommaire:

Spectral Signatures of sugar beet fields on a German test site have been measured from different levels and with different instruments. This paper deals with the measurements taken with a Bendix M2S airborne multispectral scanner, which has been operated from 300m and 2,000m altitude. Spectral reflectance factors have been calculated using ground-based reference panels. Measurement results will be compared with laboratory and in situ measurements of the same test area.

Titel:/Title:/Titre: Differences in the Spectral Characteristics of Healthy and Diseased Crops as Determined for Sugar Beets and Winter Barley
Part C: Measurements with an Airborne Multispectral Scanner

Autor(en)/Author(s)/Auteur(s):

P. Reichert
Abteilung Luftbildmessung, Universität Freiburg

Zusammenfassung:/Abstract:/Sommaire:

Laboratory measurements and to some extent in situ measurements have shown differences in the spectral reflectance of healthy versus diseased crops. Atmospheric conditions and the limited spectral and geometrical resolution of presently available airbrone multispectral scanners may, however, blur such spectral differences. Through measurements of healthy and diseased crops from an airborne multispectral scanner, the results of which will be compared with in situ and laboratory measurements of the same test area, the feasibility of applying multispectral scanner systems for crop disease detection will be tested.

Titel:/Title:/Titre:
Optical Imaging Instruments for ESA Remote Sensing Programmes

Autor(en)/Author(s)/Auteur(s):
M.L. Reynolds, ESA/Toulouse

Zusammenfassung:/Abstract:/Sommaire:

This paper defines the requirements of optical and infra-red multispectral imaging established for Coastal Ocean and Land Applications, and outlines the payload and technology studies in progress, together with the most likely design solutions to be adopted.

The current ESA planning envisages that a first space system will be launched in the mid 1980's with a second launch approximately two years later.

Titel:/Title:/Titre:

Application of Remote Sensing for Highway Maintenance and Inventory Surveys

Autor(en)/Author(s)/Auteur(s):

H. T. Rib, R. Woodman

Zusammenfassung:/Abstract:/Sommaire:

The location and construction of new highways is decreasing throughout the world. Emphasis is now placed on maintaining and improving existing highway facilities. Inventories of the present conditions of highways are an important step in determining highway needs and apportioning limited funds to their maintenance. Various remote sensing techniques have been developed in the past decade to inventory and evaluate highway conditions. In view of present needs, their value has greatly increased. Some of these techniques are discussed and illustrated in this paper. Some examples include: use of color aerial photography to evaluate pavement conditions; use of continuous strip camera, vertical photography and photologging to determine roadside and pavement conditions; and use of stereo photography to determine surface roughness and skid resistance.

Titel:/Title:/Titre: SEASAT SURFACE WIND MEASUREMENTS COMPARED TO AIRCRAFT UNDERFLIGHT MEASUREMENTS

Autor(en)/Author(s)/Auteur(s): D. B. Ross

Zusammenfassung:/Abstract:/Sommaire: Spaceborne Synthetic Aperture Radar (SAR) potentially offers the capability for monitoring both macroscopic and microscopic wind fields. This potential can be demonstrated in Seasat if the L-band (30 cm interaction wavelength) SAR backscattered power can be shown to have high correlation with measured surface wind fields. As a first step in this correlation search, the SAR relative backscattered power has been compared to the Seasat Scatterometer (2 cm interaction wavelength) and aircraft wind magnitudes for Pass 1339. As the surface wind increased from 2 m/s to 11 m/s, the SAR received power increased by approximately 10 dB. This increase, however, does not appear to follow a simple power law, and may consist of several distinct regions. Such behavior would not be inconsistent with a modified form of the Pierson-Stacy spectral model in the 1 to 30 cm wavelenth region. Qualitatively, the wind speed sensitivity exhibited by SAR was also found to be in good agreement with wind measurements derived from the Seasat Scatterometer and Scanning Multifrequency Microwave Radiometer.

Titel:/Title:/Titre:

CARTOGRAPHIE DE L'EVOLUTION DU MANTEAU NEIGEUX DU MASSIF CENTRAL A L'AIDE DES IMAGES DU SATELLITE " TIROS N"

Autor(en)/Author(s)/Auteur(s): *G. SAINT - Ph. HEBERT - C. LEPRIEUR*

CENTRE NATIONAL D'ETUDES SPATIALES - TOULOUSE - FRANCE

Zusammenfassung:/Abstract:/Sommaire:

L'existence du canal Infra-Rouge moyen dans les données du satellite TIROS N permet une bonne discrimination de la neige vis à vis des nuages. Le suivi régulier du manteau neigeux ainsi que l'étude des périodes de variation rapide, de son extenstion fournissent de nombreuses informations sur l'impact de l'enneigement sur les régions affectées ainsi que les volumes d'eau utilisables pour la production électrique.

Titel:/Title:/Titre:

SUIVI PAR TELEDETECTION AERIENNE D'UNE ZONE AGRICOLE HETEROGENE : PROBLEMES RENCONTRES ET POSSIBILITES OFFERTES

Autor(en)/Author(s)/Auteur(s): *G. SAINT - A. KILLMAYER*

CENTRE NATIONAL D'ETUDES SPATIALES TOULOUSE FRANCE

Zusammenfassung:/Abstract:/Sommaire:

A partir de campagnes aéroportées effectuées régulièrement au cours de l'année 1979 dans le Sud-Ouest de la France et de mesures faites au sol, les possibilités de détection de variabilité entre cultures d'une part et entre variétés, techniques culturales et sols, pour une même culture d'autre part ont été explorées. Les conditions de prise de vue doivent être prises en compte pour la correction des données afin d'éliminer la variabilité qu'elles induisent. L'interprétation des résultats à une échelle régionale permet de mettre en évidence les causes de différence de rendement.

Titel:/Title:/Titre: *L'imagerie spatiale de haute qualité géométrique et radiométrique*

Autor(en)/Author(s)/Auteur(s): *L. SALTER - R. PERROTTE*

Zusammenfassung:/Abstract:/Sommaire: *L'arrivée de la prochaine génération de satellites d'observation de la terre du type SPOT, LANDSAT D.... ouvrira des possibilités variées et nouvelles en matière d'imagerie spatiale (résolution à 20m par point, observation stéréoscopique, création de modèles numériques de terrain, etc....). Dans l'exposé on se propose d'attirer l'attention sur les moyens ou équipements, ; à mettre en oeuvre pour pouvoir corriger géométriquement et radiométriquement les données du Satellite SPOT et obtenir sur film transparent en grand format une image très haute définition noir et blanc et couleurs.*

Titel:/Title:/Titre:

Aerial Photography as an Aid for Rice Damage Surveillance

Autor(en)/Author(s)/Auteur(s):

E. SANWALD and F. VOSS

Zusammenfassung:/Abstract:/Sommaire:

Within the framework of the Philippine-German Plant Protection Programme, and under the sponsorship of the German Agency for Technical Cooperation, aerial photography of Philippine rice growing areas, ground truth mapping, and photointerpretation was done in 1976, 1977, and 1979. 70 mm colour infrared, colour, black and white infrared, and panchromatic black and white film was used at scales between 1 : 4000 and 1 : 20 000. Visual interpretation of the photographs and comparison to the ground truth data showed that infrared colour film is the best suited for classification of rice fields and growth stages as well as for damage detection as compared to the other films used. Infestation centres of tungro, bacterial blight, and weeds as well as lack of nutrients could be distinguished at scales up to 1:10 000. In order to provide useful help in the prevention of calamities, this technology can be very useful in the support of an early warning system in rice production.

Titel:/Title:/Titre: Recent developments in aerial and underwater time-lapse photographic systems for marine research at the Bedford Institute of Oceanography

Autor(en)/Author(s)/Auteur(s): C.T. Schafer, I. Larsen, J.R. Belanger, M. Chin-Yee, N. Fenerty, and D. Heffler

Zusammenfassung:/Abstract:/Sommaire: Many fields of marine science research rely, to a large extent, upon visual observations of natural features and the processes that form them. Results are often interpreted from remotely-sensed photographic products. Three photographic systems have been developed at the Bedford Institute of Oceanography in response to economic considerations, and to the particular scale and sampling frequency requirements of the Institute's scientific staff. The first of these consists of a 55 mm camera and mounting frame that is certified for use on a Jet Ranger helicopter. To date, this unit has been used to systematically survey marine sediment accumulation adjacent to man-made structures, to record the circulation pattern of local currents in a Nova Scotia bay, and to target geographic control points prior to a high altitude mapping program. The second system was built around a 35 mm deep sea camera and flash that was fitted with a programmable timer for time-lapse operation. This device was operated in conjunction with a current meter to study the nature of sediment movement at a depth of 2,800 m, below the axis of the Western Boundary Undercurrent off Newfoundland. The third system employes a super 8 mm camera and was also designed for underwater time-lapse photography applications. It can presently be used in water depths of up to 200 m. This unit incorporates various sensors that are coupled to a microprocessor, which can be programmed to photograph sedimentary processes under a defined set of physical conditions; sensor inputs presently include wave height, current speed and direction, or a specific rate of change of these parameters. The configuration and utilization of the three systems will be described.

Titel:/Title:/Titre: Signaturen von landwirtschaftlichen Nutzpflanzen im Radarrückstreusignal

Autor(en)/Author(s)/Auteur(s): Klaus Steiner

Zusammenfassung:/Abstract:/Sommaire:

An ausgewählten Beispielen wird gezeigt inwieweit landwirtschaftliche Nutzpflanzen mit Radargeräten klassifiziert werden können. Insbesondere wird auf Hand von Modellüberlegungen aufgezeigt welche prinzipiellen Ergebnisse in der Zukunft erwartet werden können. Abschließend wird beschrieben wie eine Kombination von Radarmessungen und optischen Befliegungsverfahren durchgeführt werden sollte.

Titel:/Title:/Titre:

SLAR Mosaic interpretation for forestry purposes, a case study of the Interpretation of a SLAR Mosaic of Nigeria without additional information

Autor(en)/Author(s)/Auteur(s):

Ir. G. Sicco Smit

Zusammenfassung:/Abstract:/Sommaire:

The SLAR user, on receiving a mosaic and its corresponding interpretation map for forestry purposes, may for several reasons obtain a wrong impression of the possibilities and restrictions of SLAR. To emphasize to the participants of this Congress the importance of additional background information and the need for groundtruth data, the author has selected as a case study a SLAR mosaic, scale 1:250,000, of a tropical rainforest region in Nigeria. The three main elements visible on SLAR mosaicsarainage, human influence and physiographic features - were interpreted and mapped. For each map 25 points of interest were selected and described in more detail to illustrate the possibilities and restrictions in the use of SLAR mosaics using no additional data or prior information. Afterwards these points of interest were compared with the vegetation and forest type map of the Nigerian NIRAD (SLAR) project. The conclusions are that the interpretation of a small scale SLAR mosaic can give important information about the three main elements, but without addition information and groundtruth data an accurate map for forestry cannot be compiled.

Titel:/Title:/Titre:

Sea ice conditions in the Weddell Sea (Antarctica) during the German "POLARSIRKEL" expedition (1979/80) as documented by TIROS-N AVHRR images

Autor(en)/Author(s)/Auteur(s):

Klaus Strübing

Zusammenfassung:/Abstract:/Sommaire:

The Federal German Antarctic research programme includes the establishment of a scientific station on the Filchner-Ronne Ice Shelf in 1981 - if possible west of Berkner Island. During the navigation season 1979/80 an expedition with the Norwegian vessel "POLARSIRKEL" entered the Weddell Sea Polynya to survey the front of the ice shelf for a suitable discharging 'port'. The success of the expedition depended very much on the sea ice conditions which are in the western Weddell Sea normally very difficult. By TIROS-N AVHRR images the unusual favourable development of the sea ice conditions in the season 1979/80 is demonstrated.

Titel:/Title:/Titre:

Application of remote sensing techniques
for sea ice reconnaissance in the western Baltic

Autor(en)/Author(s)/Auteur(s):

Klaus Strübing

Zusammenfassung:/Abstract:/Sommaire:

Sea ice in the western Baltic is normally restricted to the coasts. Ice at sea occurs in more severe winters only, i.e. about two or three times per decade. So it was not until the winter 1978/79 that - since the launch of the first LANDSAT satellite in 1972 - sea ice could be detected on LANDSAT images of this sea area.
In the same severe winter for the first time a side-looking airborne radar (SLAR), developed by the Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt (DFVLR), could be tested in the Kieler Bucht for sea ice reconnaissance.
The results of both, the LANDSAT images and the SLAR, are presented.

Titel:/Title:/Titre: Landsat data and topographic maps for a forest inventory.

Autor(en)/Author(s)/Auteur(s): Jüri J Talts

Zusammenfassung:/Abstract:/Sommaire:

The paper will discuss methodology and present results of an experimental forest inventory where Landsat data and digitized topographic maps are used simultaniously. The purpose of the investigation is to see if data from present Landsat can be applied to a national forest inventory in Sweden.

Titel:/Title:/Titre: "Development of Space Technology for Resource Applications in the 1980's"

Autor(en)/Author(s)/Auteur(s): James V. Taranik and Pitt G. Thome

Zusammenfassung:/Abstract:/Sommaire: The resource observation program within NASA's Office of Space and Terrestrial Applications conducts research and develops technology for space related observations of the Earth. The program has three interrelated elements which address national and global needs. The Renewable Resources program is largely aimed at improving agricultural assessments through a program called Agristars which has evolved from the success of the Large Area Crop Inventory Experiment (LACIE) project. The Non-Renewable Resources program is directed towards improving the effectiveness of global assessment and exploration for mineral and energy resources. The Geodynamics program is focussing on global observations of crustal plate stability or deformation, earth rotation, and polar motion to better understand dynamic processes related to earthquakes. Research and development is phased to first develop understanding of the scientific basis for earth observations through laboratory, field and aircraft experiments. Experimentally developed space systems are tested in space using the Shuttle or experimental free-flying satellites. Remote sensing systems which are proven operational will be managed by the U. S. Department of Commerce.

Titel:/Title:/Titre: Considerations photogrammetriques concernant l'utilisation des photos du satellite (RST et d'autres)pour la determination de la côte roumaine de la Mer Noire dans la secteur du Delta du Danube.

Autor(en)/Author(s)/Auteur(s):
TRAIAN TEODORU

Zusammenfassung:/Abstract:/Sommaire: On déduit l'évolution de la lique de côte de la mer Noire lors des derniers cert ans,d'après des photogrammes obtenues de vols répétés et des photos du satellite. On determine aussi l'utilisation spécifique des terrains dans le Delta du Danube,en proposant une régionalisation geographique de la région deltaique toute entière.

Titel:/Title:/Titre: An Integrated Analytical System to Use Remote Sensor Data for Evaluating Engineering Projects.

Autor(en)/Author(s)/Auteur(s): Dr. A. Keith Turner

Zusammenfassung:/Abstract:/Sommaire: For many years remote sensor data have supported the qualitative assessment of proposed engineering projects. More recently, quantitative evaluation of specific project alternatives have been undertaken. These more precise studies require more complex analytical procedures including computer-based models, multi-date sensor data, ancillary data sources, and digital terrain models.

This paper defines the integrated analytical system which has successfully used remote sensor data in engineering project evaluations. Typical products are shown for several applications, including highway location and energy resource development.

Titel:/Title:/Titre: SATELLITE LANDSAT-SKYLAB EVALUATION OF SELECTED NATURAL RESOURCES OF THE ARGENTINE REPUBLIC AT SCALES 1:125.000 AND 1:250.000 OF MORE THAN 1,000.000 KM2

Autor(en)/Author(s)/Auteur(s): ENGINEER ALBERTO BENITO VIOLA (Professor of Remote Sensing National University Buenos Aires, President, AEROTERRA S.A. and CARLOS M. VIOLA BINAGHI (Assistant Professor Remote Sensing and Vice President of AEROTERRA S.A.)

Zusammenfassung:/Abstract:/Sommaire:

This report synthesizes the practical applications of satellite remote sensing using LANDSAT-SKYLAB at scales 1:250.000 and 1:125.000 in more than 1.000.000 KM2 of the Argentine Republic. The natural resources inventories were made from 1976 to 1979 and they included the following States: Buenos Aires (307.571 KM2); Corrientes (88.199 KM2); Chubut (224.686 KM2); Formosa (72.066KM2); Misiones (29.801 KM2); Santiago del Estero (135.254 KM2) and Pilcomayo River Basin in Argentina-Paraguay (206.500 KM2).

The main goal of the different proyects was to obtain in the least possible time a uniform, objective and up-to-date carthographic vision of the potential of the existing natural resources, in order to help the making of a cuali-cuantitative diagnosis of them and the appropriate selection of priority areas which should be developed first.

The studies were carried on by multi-disciplinary scientific teams who worked on a multispectral - multitemporal basis by manual image interpretation using specially the selected images of the multispectral scanner (MSS) of LANDSATS 1,2, and 3, and complemented with the SKYLAB (S-190A and S-190B) images, aerial photography and ground surveys, in order to obtain different kinds of natural resources thematic maps, as well as black and white, color and color infrared photomosaics, etc., in an average time of 150 days for each selected region.

The different thematic maps made at scale 1:250.000 and/or 1:125.000 were integrated specially by the LAND USE and HYDROLOGY inventories, and complemented by special maps, such as GEOMORPHOLOGY, STRUCTURAL-GEOLOGY, HYDROGEOLOGY, EDAPHOLOGY, UNDERGROUND WATER, SOIL SALINITY, EVOLUTION AND DEVELOPMENT of BOUNDARY AREAS, etc.

This report describes not only the used methodology but also the results and experiences classified by states and satellite maps. It also tries to help in the process of technology transfer of satellite remote sensing for those countries with similar problems, because, the technological and scientific knowledge has mankind as its final destination.

Titel:/Title:/Titre:

Remote Sensing and Nomadism in Afghanistan

Autor(en)/Author(s)/Auteur(s):

Rudolf Winter und Michael Casimir

Zusammenfassung:/Abstract:/Sommaire:

The investigations of causes of the increasing desertification of arid and semi-arid areas of the world are combined with the question of the influence of nomadism. Ecologic ground truth and quantitative analysis of grazing rates and food selection of herd members have been the basis for the analysis of large-scale satellite image data applied to a nomad's winter area in Western Afghanistan.

Titel:/Title:/Titre: Operational use of satellite imagery - are we there yet?

Autor(en)/Author(s)/Auteur(s): Stefan Zenker, Swedish Space Corporation

Zusammenfassung:/Abstract:/Sommaire: The Swedish Space Corporation (SSC) is heavily engaged in developing and promoting remote sensing technology in Sweden. It operates the Esrange Landsat Station in Kiruna and an advanced image processing laboratory in Stockholm.

Based on SSC experience, an assessment is made of present realities and near-term prospects in the operational use of satellite data. Some factors that impede the transition from proof-of-feasibility to routine exploitation are identified. The power of integrating satellite data with geographical data bases is illustrated using practical examples, and some implications are discussed.