Technical Program
and Final Summary Digest

8th International Symposium on
Remote Sensing

17–21 September 2001
Centre de Congrès Pierre Baudis • Toulouse, France

Symposium Chairs:
Hatem Nasr, vMonitor, USA
Luca Pantani, CNR-IROE Florence, Italy
Jean-Louis Fellous, CNES, France

• Atmospheric Sensing
• Earth Surface Sensing
• Platforms and Systems

Sponsored by:
SPIE The International Society for Optical Engineering

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Wednesday 19 September

SESSIOm 5
Room: Guillaume 2 ...................................... Wed. 09.10

Ecosystems II
Chair: Yann H. Kerr, CNES-CESSIO (France)

09.10 Effects of nitrogen stress in grass stands on evolution of ground cover and spectral characteristics of leaf strata, A. Schut, J. Ketelaars, Plant Research International BV (The Netherlands) ......................... [4542-26]

09.30 Relation between bulk temperature based on in-situ temperature profiles and NOAA-AVHRR sea surface temperature data for Lake Constance, S. Thiebaut, C. Hase, T. Heep, DLR (Germany) ......................... [4542-27]

10.00 Assimilating of satellite observations in a coupled vegetation growth and energy model: applications to semi-arid areas, R. Cayrol, Ctr. d'Etudes Spatiales de la Biosphere (France); L. Kergoat, Lab. d'Ecologie Terrestre (France); A. Chehbouni, Ctr. d'Etudes Spatiales de la Biosphere-IRD (France); G. Dedieu, Ctr. d'Etudes Spatiales de la Biosphere (France) ......................... [4542-28]

Refreshment Break ................................... 10.10 to 10.40

10.40 Comparison of two surface scattering models (SSA and IEM) for surface parameter retrieval, J. L. Alvarez-Perez, I. Hainseke, DLR (Germany) ......................... [4542-29]

11.00 ASTER observations of the spectral emissivity over New Mexico, T. J. Schmugge, A. French, J. Ritchie, A. Rango, U.S. Dept. of Agriculture ......................... [4542-30]

Lunch Break ........................................... 11.20 to 13.50

SESSIOm 6
Room: Guillaume 2 ...................................... Wed. 13.50

Ecosystems III
Chair: Thomas J. Schimper, U.S. Dept. of Agriculture


14.10 Assessment of surface processes models derived from hypsotects multiligular data; the DAEREX airborne campaigns in 1996, 1998, 2000, M. Menenti, Univ. Louis Pasteur (France); I. F. Moreno, Univ. de Valencia (Spain); R. Richter, DLR (Germany) ......................... [4542-32]

14.30 Radargrammetry helps fight hunger in Ethiopia, T. Kippie, Agricultural Bureau for Gedo Zone (The Netherlands); P. P. Romeijn, Treemaile (The Netherlands); E. Nezry, F. Yekam-Simeon, Privateers NV (France) ......................... [4542-33]

14.50 Land cover and land use survey in residual "quilombo" community areas in the Trombetas river basin, State of Pará, Brazil, A. Venturi, O. dos Santos Water, S. M. Neiva Sampato, M. C. Thales, EMBRAPA Amazônia Oriental (Brazil); J. L. Gavina Pereira, Museu Paraense Emilio Goeldi (Brazil) ......................... [4542-34]

Refreshment Break ................................... 15.10 to 15.40
vegetation component is also a significant factor of directional effect on equivalent angular radiance.

**4542-45, Poster Session**
**Comparison of Eye-Safe UV and IR Lidar for Small Forest Fire Detection**

Rui Vilar, Alexander Lavrov, Andrei Utkin, Armando Fernandes, (RVT, AU, AF: Instituto Superior Técnico, Departamento de Engenharia de Materiais, 1049-001, Lisboa, Portugal) (AL: Russian Scientific Center "Applied Chemistry", 197198, St.-Petersburg, Russia)

Lidar is a promising instrument for forest fire detection, because the active detection mode allows small plumes resulting from early stages of forest fires to be efficiently revealed. Since forest-fire monitoring must be performed in inhabited areas, the instrumentation must be eye-safe. Suitable wavelength $\lambda$ ranges satisfying this requirement are $\lambda<0.4$ and $\lambda>1.4$ $\mu$m. We compare the lidar efficiency for the eye-safe wavelengths 0.3472 $\mu$m (second harmonic of the ruby laser) and 1.54 $\mu$m (Er:glass laser). The following values for the parameters were assumed: the visibility is 15 km, the fuel mass burned per unit time is 0.05 and 2 kg/s, pulse duration is 20 and 50 ns, a beam divergence is 2.5 and 10 mrad, a distance between the plume's illuminated area and the ground is 0 and 100 m. The results of calculations show that energy required for detection with the UV lidar becomes greater than corresponding value for plume detection with the IR lidar at the distance of 2-6 km depending on the parameters. As the technology of the ruby laser is more developed than that of the Er:glass laser, the use of lidar at 0.3472 micrometer may be preferable for distances exceeding 6 km.

**4542-47, Poster Session**
**Comparative Analysis of Environmental Quality and Zoning of Watersheds: A Methodologic Contribution**

Andrea Ferraz Young, Jansle Vieira Rocha (Agricultural Engineering, State Univ. of Campinas - São Paulo State - Brazil)

The main goal of this study was to evaluate the environmental condition of two watersheds, called "Ribeirão das Cabras" and "Ribeirão Piracicamirim", both part of the "Piracicaba" River Watershed (São Paulo State - Brazil), using Remote Sensing and Geographic Information System (GIS), in order to provide subsidies to land use planning.

Tendencies and potentialities were identified in each area in order to study the land use adequacy using different scenarios and propose a land use planning for both regions using environmental planning concepts. Spatial analysis with Geographical Information Systems allowed the production of a database with the main elements of the area.

All information layers were integrated and analysed to generate land use capacity maps. These maps, together with maps of possible protected areas, according to the environmental laws, were compared to the actual land use, leading to maps of conflict areas for both watersheds, which were studied and compared through methods and specifics criteria to identify tendencies and potentialities for both areas.

The natural and cultural attributes, main degradation processes, development tendencies and potentialities identified in each area, and the available legal instruments, were the basis for a guideline for conservation and protection of these areas through environmental planning concepts, which showed to be very important and adequate to the occupation planning process.

**4542-48, Poster Session**
**Land Surface Heterogeneity Effects on Surface Energy and Water Fluxes**

David Toll, Jared Entin, Paul Houser (NASA/Goddard Space Flight Center, Greenbelt, MD 20771)

The land surface profoundly affects weather and climate primarily through heat release from the Sun's radiation and evaporation of water. The complex surface heterogeneity combined with temporal and spatial variations in radiation and precipitation yield a corresponding complexity to the surface energy and water fluxes. The primary objective of this study is to quantify the effects of land surface variability on the surface energy and water fluxes. To study the importance of land surface heterogeneity on climate models we used the MOSIAC land surface model within the context of the LAND Data Assimilation Systems (LDAS). Preliminary analysis of results indicated there were substantial differences in surface heat fluxes and runoff for certain geographical regions with contrasting cover such as forest, grasses, and crops when using only one cover class per grid. In addition, results indicated for spatially varying areas two to four classes per grid typically captured most of the variation in surface energy and water fluxes. Also, in comparison between 1/8 degree versus 1 degree grid cell input data, the finer resolution land cover data were more important than finer resolution forcing data (e.g., precipitation and radiation).