COMMERCIAL EARTH OBSERVATION

A close relative of the NASA VIP program (see page 88) is the government/industry cooperative program known as EOCAP (Earth Observation Commercial Applications Program). Designed to help private industry develop and commercialize applications of remote sensing, EOCAP is an effort to encourage private investment in, and broader use of, NASA technology for gathering and analyzing information about Earth's land and ocean resources.

Like VIP, EOCAP is managed by Stennis Space Center, but the programs differ. VIP generally involves short-term projects of three to six months with NASA providing the funding; EOCAP projects can run three years or more and funding is shared by NASA and the private sector participant.

An EOCAP example is the development of a new tool for analyzing remotely sensed data, a process that provides a subpixel detection capability for increased accuracy and significantly enhanced discrimination among surface features in imagery.

Known as the Applied Analysis Spectral Analytical Process, or AASAP, the program was developed by Applied Analysis, Inc. (AAI), Bellerica, Massachusetts. **At left** are AAI president Donald B. Damm, (seated) and the company's chief scientist, Dr. Robert L. Huguenin, who developed AASAP.

As the term implies, subpixel processing detects or classifies objects that are smaller than the size of a pixel. In most remote sensing applications, image pixels are "mixed pixels," meaning that they contain not only the unit of interest but also "background" features that distort the spectral properties of the unit of interest, resulting in a loss of discrimination and potential misclassification.

AASAP enhances the classification process by removing the background. To do so, the software must identify the background matter in each pixel, then remove exactly the right amount of it. The residual spectrum (what's left after background removal) is a relatively pure representation of the unit of interest. **At top right** is a comparison
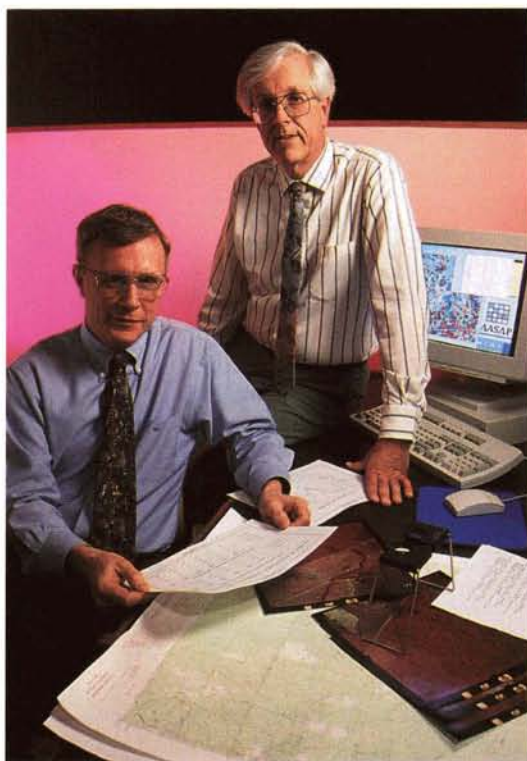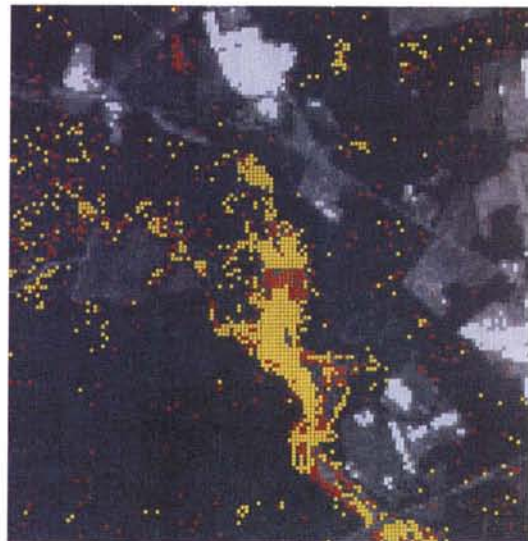
between normal satellite imagery (at left) and a subpixel processed image; the yellow/red area in the right image represents the additional information obtained by subpixel processing.

According to its developers, AASAP is achieving accuracies of about 90 percent. It is now being offered as a modular addition to the ERDAS IMAGINE software package marketed by ERDAS, Inc., Atlanta, Georgia for remote sensing applications.

Another EOCAP example involves the development of the SeaStation ocean information systems by Ocean and Coastal Environmental Sensing (OCENS), Seattle, Washington. Through an EOCAP partnership, OCENS developed SeaStation, a low-cost, portable, shipboard satellite groundstation integrated with vessel catch and product monitoring software.

SeaStation targets marine users in the commercial and recreational fishing markets, along with recreational boaters. It provides a Windows-based graphical interface that permits the user to acquire and process environmental data originating with satellite-based sensors. Acquisition and processing software is linked to the Global Positioning System data stream to provide real time relationships between vessel position and such data as sea surface temperature, weather conditions and ice edge location. This allows the user to increase fishing productivity and improve vessel safety. **At left,** OCENS president Mark H. Freeberg and a client, an officer (red clothes) of a commercial fishing vessel, check the output of the SeaStation system. On the **opposite** page, top, is a representative SeaStation screen showing ocean temperature gradients and ship position data.

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