

CSIRO ATMOSPHERIC RESEARCH

COMMON AVHRR PROCESSING SOFTWARE (CAPS)

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CAPS development began in 1997 and the software is now a mature, stable product. The following describes developments since the last report on CAPS in the 1998 WASTAC Annual Report.

As well as the previously supported Linux (for PC), Solaris (Sun) and Irix (Silicon Graphics), CAPS now runs under the Microsoft Windows operating system and on Hewlett Packard Unix systems. CAPS is now able to read data in all the known formats in which AVHRR data have been archived in Australia. There is support for the NOAA-16 satellite, which was launched in September, 2000. A cloud detection module (based on the CLAVR algorithm) has been developed. There is a new Graphical User Interface (GUI).

CAPS is used by DOLA to calculate and map hot spots (fires), fire scars, grassland curing index, sea surface temperatures, land surface temperatures and NDVI. CAPS is used by CSIRO Marine Research in Hobart for 'warping' of SeaWiFS data onto a latitude/longitude grid. Both the input and output files are in HDF format. There have been successful tests of warping of MODIS data, which is also commonly stored using HDF.

Ancillary data are required for calibration and navigation. Data for calibration of each satellite are provided by CSIRO Atmospheric Research. CSIRO Marine Research generates navigation data (position, velocity and attitude of the satellite) soon after each pass is received. This aspect of the system has worked well over

a number of years, although there have been occasional errors and other problems.

The NAP (N-dimensional Array Processor) package was developed as part of the CAPS project. NAP provides a powerful and efficient arithmetic and input/output facility in the Tcl/Tk environment in which CAPS operates. A number of new features have been added to NAP. There are new unsigned integer data-types, which are needed to read MODIS HDF files. There is support for netCDF (as well as HDF) input/output. There are facilities to read and write binary data. These were used by the Bureau of Meteorology to develop an interface to the McIDAS file format. There is a new library of statistics functions. The new function for calculating spatial correlations can be used to correct for errors in navigation by matching small areas (called 'chips') whose position is known. There is a new graphing facility 'plot_nao' for the display of data as XY graphs and images. The facility to load modules compiled from C and Fortran has been used to produce land/sea masks based on data and a modified version of software obtained from Rutherford Appleton Laboratory.

The CAPS Developers' Group has been created and includes several members from WASTAC. Members have signed a legal agreement, which is designed to promote the sharing of software while protecting Intellectual Property.

It is planned to replace the main CAPS processing script 'avhrr2hdf' with a new modular system that will facilitate the integration of new processes including cloud detection, atmospheric correction and BRDF.