iDAP/MacroPro
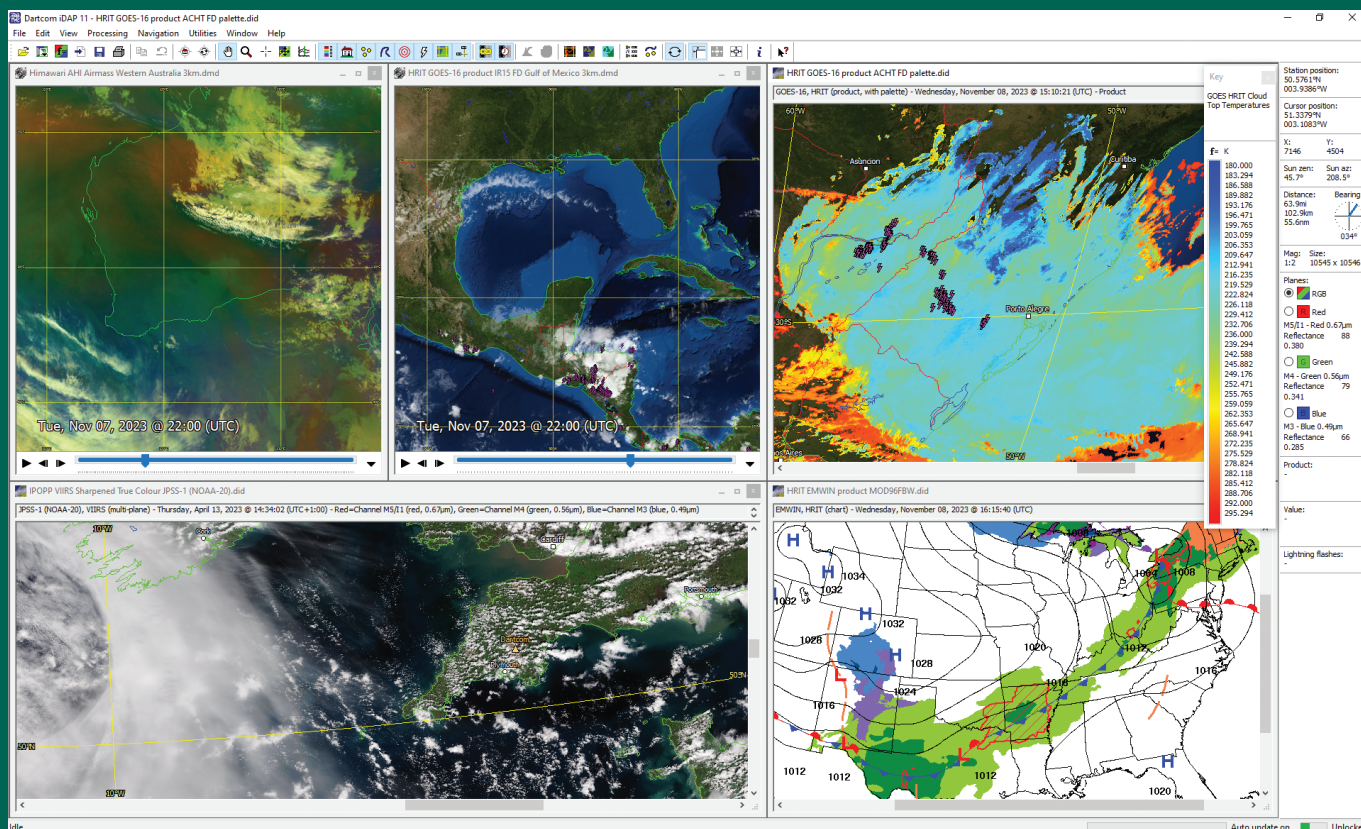
Integrated display and processing software for satellite imagery and meteorological data with automatic importer and macro processor

The Dartcom iDAP software allows images, charts and animations produced by all Dartcom ingest systems to be displayed and processed in one unified program. MacroPro automates the powerful import, processing and output facilities provided by iDAP.

iDAP includes a wide range of professional yet easy-to-use facilities for displaying, processing, printing and exporting satellite imagery, meteorological charts and products.

Dartcom's own purpose-built image and animation technologies efficiently support huge image sizes and smooth, high-quality animations with fast updates and editing facilities.

MacroPro allows processing macros to be run on images and charts automatically when new data is ingested or imported.

Key features of iDAP and MacroPro include:

- Handling of HRPT, AHRPT, DMSP, Terra, Aqua, Suomi-NPP, JPSS, FY-3, MTG, GOES ABI, LRIT, HRIT and UHRIT data.

- Automatic updating of open files as new data is received.

- Worker threads utilising multiple CPU cores for faster processing.

- RGB products such as Airmass, Ash, Convection, Dust, Microphysics, True Colour and Natural Colour using band mathematics.

- Palette products such as cloud temperature, rainfall rate, SST, NDSI and NDVI, with built-in formula language.

- Reprojection of images to map projections such as Mercator, Equirectangular and Polar Stereographic, with mosaic facility.

- Blue Marble and DEM masking with blending, tinting and slicing.

- Map overlays and vector features such as points of interest and storm or vessel tracks, with labels and range rings.

- Multiple animations with time-synchronised playback.

- Lightning flash overlays and lightning density products.

- Exporting to JPEG, PNG, BMP, TIFF, CSV, PCI Geomatica, ERDAS IMAGINE, ENVI/IDL, GeoTIFF, EPS level 0 and NOAA level 1B.

General features

- Opens, displays, processes, prints and exports HRPT, AHRPT, DMSP, Terra, Aqua, NPP, JPSS, FY-3, MTG, GOES ABI, LRIT, HRIT and UHRIT data.

- Multiple image, chart and animation windows.

- Handles large images with ease and efficiency.

- Worker threads utilising multiple CPU cores for faster processing.

Input and output

- Automatic updating of open files with new data.

- Lightning flash database feed from Geostationary Ingester.

- Printing of user-defined areas of images and charts, with overlays.

- Exporting of raw and calibrated data to PCI Geomatica, ERDAS IMAGINE, ENVI/IDL and GeoTIFF formats.

- Exporting to JPEG, PNG, BMP, TIFF and GeoTIFF formats with area selection, overlays, size limiting and automatic file naming.

- Exporting of data (pixel, raw, calibrated, product, latitudes and longitudes, solar angles, satellite angles, lightning flash counts) in text and binary formats (including CSV and GeoTIFF) with area selection and automatic file naming.

## Automatic import and processing (MacroPro)

- Background automatic image importer with multiple sources, satellite filtering, file naming options, map overlays and archiving.

- Setup of macros to perform automatic processing on images each time new data is produced by ingest systems or imported.

- Automatic enhancement, filtering, masking, exporting, printing, saving, archiving, reprojection and product creation.

- Automatic animation with sub-sampling, adjustable maximum length (frames or timespan) and overlays.

- Detailed diagnostics with logging, alarms and storage monitoring.

Image viewing and manipulation

- Read-outs panel showing station and cursor positions, distance and bearing, solar angles, plane data types, raw, calibrated and product values, and lightning flash counts.

- Dragging and zooming modes.

- Cursor mode allowing a draggable persistent cursor to be placed on a point of interest on an image and static read-outs obtained.

- Profiler mode showing the distance, bearing and raw, calibrated and product value profiles along a line.

- Option to automatically centre images on the current station position – ideal for mobile systems and moving vessels.

- Viewing of individual planes in multi-plane images.

- Multiple display support with tools for easy window arrangement.
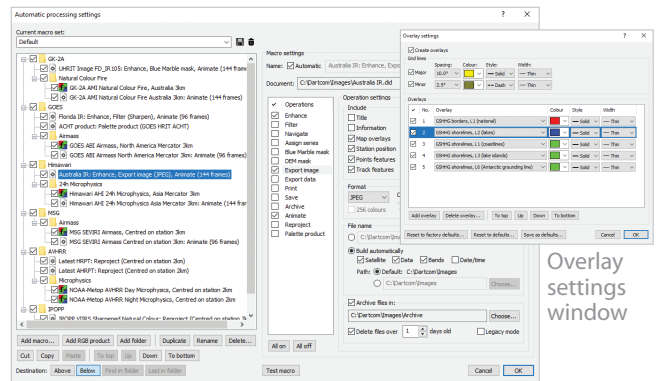
Image enhancement

- Histogram adaptive image enhancement facilities with variable profile, clipping, brightness, contrast and gamma.

- Enhancement settings can be saved as presets for quick recall.

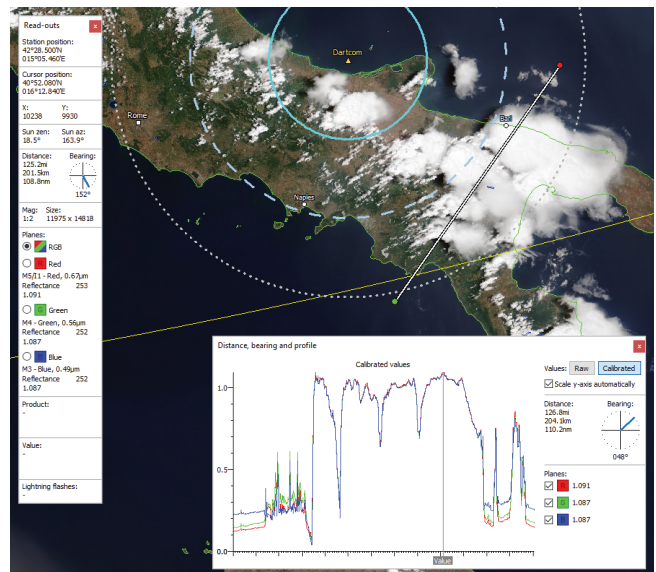- Sharpen, soften, edge enhancement and blur functions.
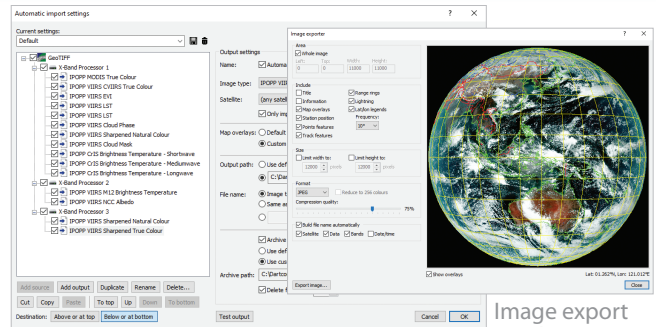
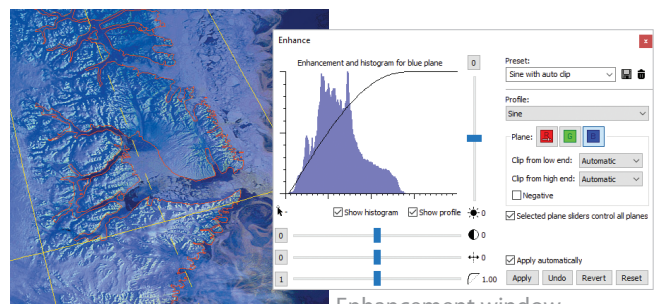Automatic import setup window

Image export window

Automatic processing setup window
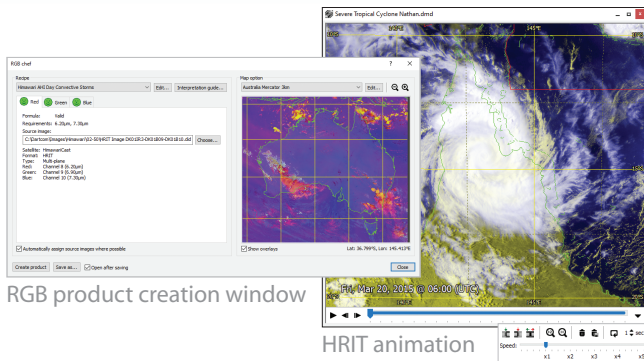
Overlay settings window

Profile along a user-defined line on a JPSS-1 true colour image with cursor read-outs and range rings around station marker
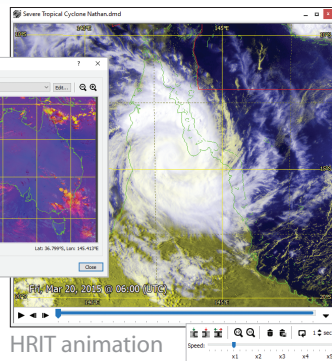

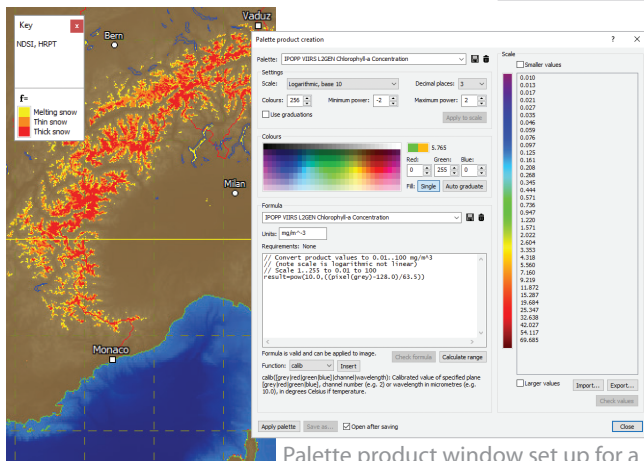Enhanced and sharpened HRPT image showing icebergs

Enhancement window
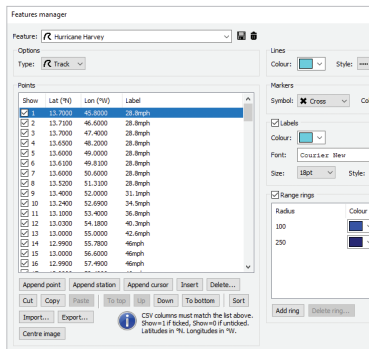
RGB product creation window
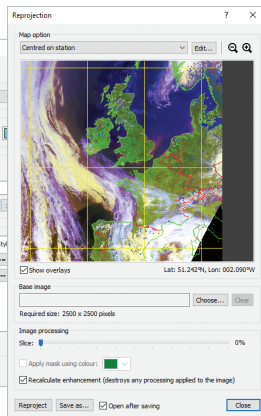

HRIT animation

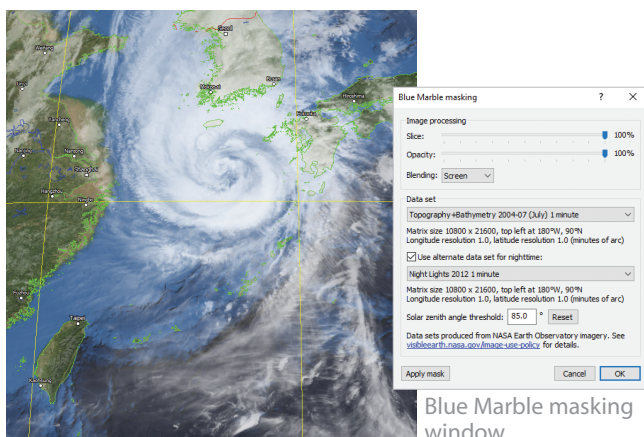HRPT snow index product with DEM mask

Palette product window set up for a logarithmic Chlorophyll-a product

Feature overlays manager

Reprojection window

GEO-KOMPSAT-2A UHRIT 10.5µm infra-red image with Blue Marble mask

Blue Marble masking window

Animations

- High-quality animations with adjustable speed, looping, selection of range of frames to play and removal of unwanted frames.
- Acquisition time shown on frames, with configurable appearance.
- Time-synchronised playback of multiple animations.

Products and classifications

- RGB products such as Airmass, Ash, Convection, Dust, Microphysics, True Colour, Natural Colour and blended images using built-in formula language to perform band mathematics.
- Palette products such as cloud temperature, cloud height, rainfall rate, SST (sea surface temperature), NDSI (snow index), NDVI (vegetation index) and lightning density.
- Configurable scale (linear, logarithmic or classification), limits, decimal places and colours, with graduated blending option.
- Importing and exporting of colour scales.
- Palette key displayed in a floating window.
- Comprehensive formula language with functions for arithmetic, trigonometry, conversion, time, point data, lightning data, blending and enhancement.

Overlays

- Map overlays and grid lines, with configurable colours and styles.
- Comprehensive overlays library based on the GSHHG data set.
- Station position marker with configurable symbol, colour, label and range rings.
- Vector feature overlays such as reference points, storm tracks and vessel voyage tracks, with configurable marker symbols, line styles, colours, labels and range rings.
- Importing of points and lines from Google Earth KML/KMZ files and ESRI Shapefiles.
- Lightning flash overlays with configurable time window, symbol, colour graduations and sample size.

Reprojection

- Reprojection of images to map projections such as Mercator, Equirectangular and Polar Stereographic.
- Configurable projection parameters, resolution, size and overlays.
- Option to automatically re-centre the map on the current station position – ideal for mobile systems and moving vessels.
- Map parameters can be saved as presets for quick recall.
- Creation of mosaics composed of a number of different images.

Land and sea masking

- Blue Marble (cloud-free high-resolution satellite image) masks allowing full colour topology and bathymetry to be applied to dull, featureless or greyscale images.
- Night lights blending with Blue Marble masks for nighttime areas.
- DEM (Digital Elevation Model) masks allowing a solid colour or graduations to be applied to land and/or sea areas.
- Variable slicing, opacity, blending and data set, with screen blending mode to extract cloud easily.

Polar orbiter features

Importing

- Importing of raw HRPT data in Dundee standard, Quorum standard and legacy Dartcom HRPT/CHRPT Grabber formats.

- Importing of raw AHRPT data in Dundee standard format.

- Configurable satellites database for raw import.

- Manual and automatic importing of GeoTIFF images produced by NASA IPOPP and CMA FY3L1pp processing software, with product browser, file naming options, map overlays and archiving.
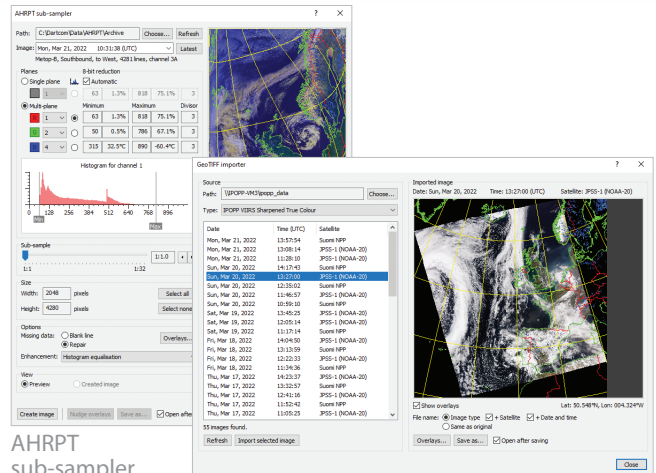
Sub-sampling

- Sub-sampling of HRPT, AHRPT and DMSP data to produce calibrated, navigated iDAP images.

- Single plane or multi-plane (false colour) images.

- Area selection with latitude/longitude read-outs to assist.

- Automatic or manual 8-bit reduction parameters with statistical analysis, histograms and calibrated read-outs to assist.

- Image enhancement with adjustable profile.

- Navigation and creation of map overlays and grid lines.

- Repair of missing image lines.

- Overlay nudge facility to correct any minor navigation errors due to out-of-date prediction data or satellite attitude errors.

- Adjustable satellite swathe angle.

- Editing of calibration parameters, with import and export.

Processing

- RGB products such as Cloud, Microphysics, blended visible/infra-red and blended False Colour/infra-red.

- Palette products such as SST, NDSI and NDVI.

- Reprojection of satellite swathe (as ingested) to map projections such as Mercator and Polar Stereographic, with mosaic facility.

Exporting

- Exporting of raw and calibrated HRPT, AHRPT and DMSP data to PCI Geomatica, ERDAS IMAGINE, ENVI/IDL and GeoTIFF formats, reprojected and with layers for solar and satellite angles.

- Exporting of raw AHRPT data to standard EPS level 0 format, with product filtering.

- Exporting of raw HRPT data to standard NOAA level 1B format, with packing, byte order and file naming options.

- Exporting of raw HRPT data to other raw formats including standard raw and HRPT level 0, with header, byte order and file naming options.

- Exporting of ancillary HRPT data, including NORAD two-line elements, TBUS data, DCS and TIP, with file naming options.
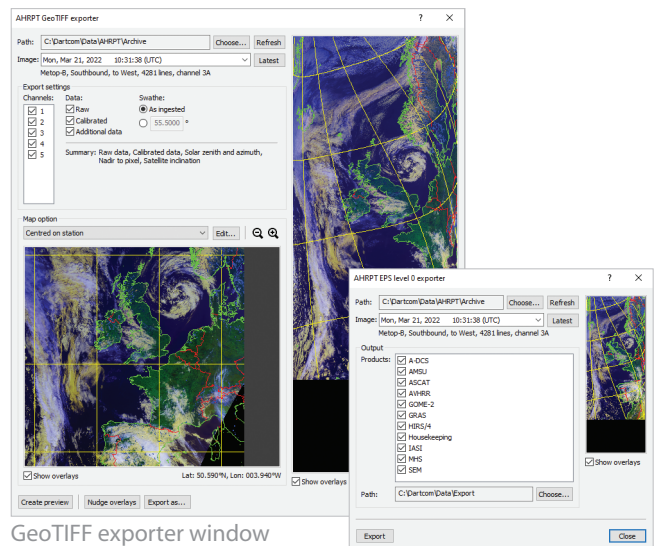
AHRPT sub-sampler window

GeoTIFF importer window
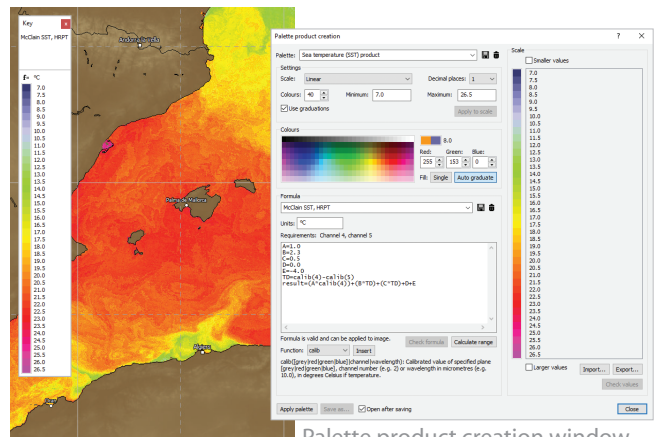
HRPT SST product with DEM mask obscuring land

Palette product creation window set up for an HRPT SST product

GeoTIFF exporter window

EPS level 0 exporter window