

Over the years, Satellite Remote Sensing has proved its promise in natural resources inventory & management and wide range of environmental applications due to its unique capability of providing multi-spectral digital information in synoptic & repetitive manner. With the advent of Digital Image Processing techniques and rapid growth in computing technology, potential of remote sensing data could be explored to greater extent in deriving vital information for natural resources inventory, monitoring and management.

Having got convinced with the potential and inevitable role of satellite remote sensing in natural resources management, sizable user community viz. small users, line departments, NGOs, academic institutions etc. can not afford it due to the high cost of Commercial of the Shelf (COTS) packages required for processing the data. Most of the COTS packages have stringent licensing policies, proprietary formats, recurring maintenance cost. Moreover, It is observed that, sizable user community often requires only limited functionalities of the COTS package to cater to their routine processing needs.

Considering the above, the development of indigenous image processing package 'PRIMEWIN' has been taken up at RRSSC, Nagpur without any dependency on third party tools, runtime versions/libraries, data structure, formats etc. The package envisages to encompass the most frequently used functionalities of digital image processing.

The packages uses open source raster data structure 'GeoTiff' and handles all data types 8 - 32 bit, gray scale and palate color images. Open source vector data structure 'shapefile' is used for handling vector data.

• Functionalities Available

▪ Satellite Data Loading

- Loading of IRS series of data to Viewer or Disk.

▪ Viewer

- Overview & full resolution display, Numeric dump, Contrast enhancements, Sub-image extraction, Pseudo-color rendering, burning LUTs, Profile, Statistics, Pixel grabber etc.

▪ Vector Utilities

- Overlay, Rendering, Annotation, Identify, Query etc.

▪ Geometric Correction

- GCP collection (image- image), Mosaic area, Image registration, Projection parameters etc

▪ Image Transforms

- Principal component, Intensity-Hue-Saturation, Tasseled-Cap, Data fusion etc.

▪ Spatial Filtering

- Average, High pass, Edge detection, Edge sharpening, Directional, Custom, Preview etc.

▪ Arithmetic Band Combinations

▪ Supervised & Unsupervised Classification

- Training site collection, Signature Separability, Confusion Matrix , MINDIS, PP, MXL, ISODATA, K-MEANS etc.

▪ Utilities

- Image Statistics, Topo Index etc.

- Application modules for OCM data processing, NOAA SST

▪ Online hypertext help

Main Interface

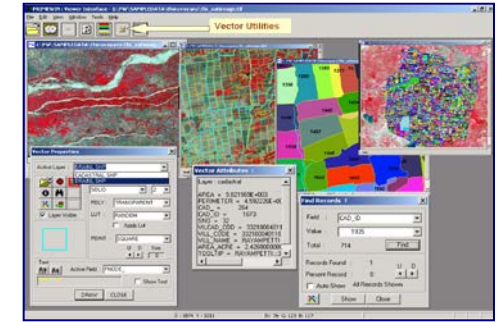


Viewer

Image display interface



Vector display interface



Geometric Correction

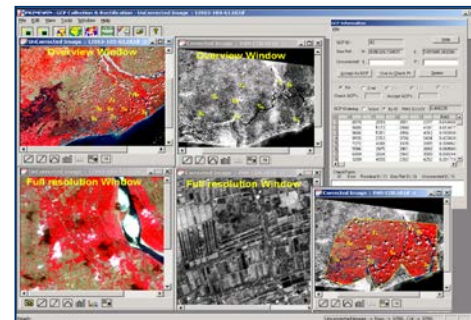
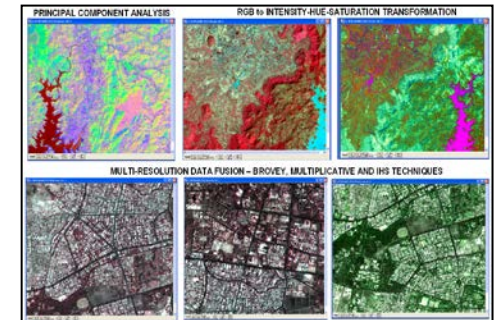


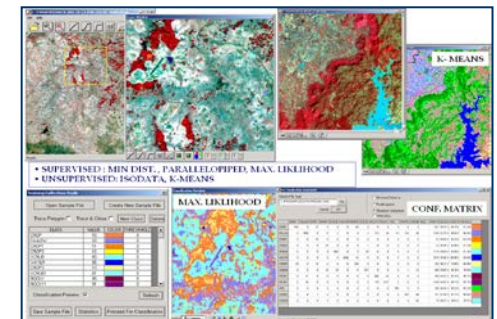
Image Transforms



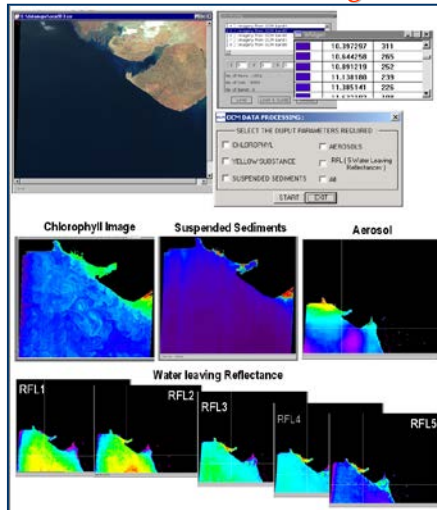
Spatial Filtering



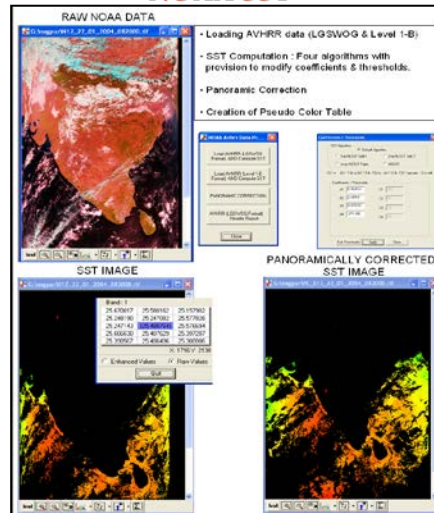
Classification



OCM Data Processing



NOAA SST



• System Requirements

- Pentium III or above
- RAM: 512 MB or above, preferable 1 GB
- Monitor: 17", preferable 21" (resolution: 1280 x 1024 or above)
- OS: Windows NT, 2000, XP

• User Community / Target Uses

- Academic Institutions, Line departments, NGOs
- Village Resource Centres
- As a demonstration tool, teaching / learning aid
- As add-on tool along with data products supplied by NDC

• Modules under development

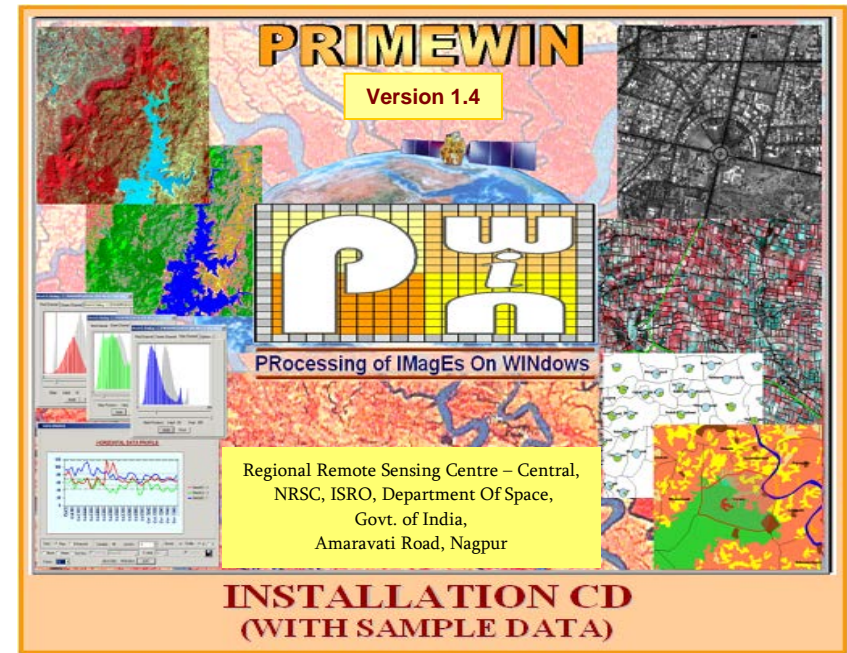
- Refinement & Aggregation
- Topindex - Spatial referencing
- Texture Analysis
- Data fusion using Wavelet transforms
- Segmentation & Region growing

Address for Correspondence

**Regional Remote Sensing Centre- Central
NRSC, ISRO, Department of Space, Govt. of India
Amravati Road, NAGPUR**

Ph: 0712-2500393 / 6621200

Fax: 0712-6621240



PRIMEWIN: Processing of Images on Windows (Version 1.0) (An Indigenous Image Processing Package)

An indigenous standalone image-processing package is developed using VC++ on windows platform. The required GUIs, controls and libraries have been developed independently. It encompasses most frequently used functionalities of digital image processing viz. Satellite data loading, viewer for display of data, vector overlays, sub-image extraction, image extraction using vector mask, statistics, geometric correction, image enhancements, image transforms, spatial filtering, arithmetic band combinations, supervised & unsupervised classification, signature separability, confusion matrix etc. and add-on application modules for OCM data processing, NOAA SST. In addition, limited handling of vector data viz. overlay, rendering, annotation, identify, query etc. is also supported.

It supports IRS series of data viz. LISS-I, LISS-II, LISS-III, PAN, WiFS, LISS-IV, LISS-IV mono, AWiFS, CARTOSAT, OCM etc.

The package is being developed primarily keeping in mind the requirements of target users viz. academic Institutions, NGOs, line departments, village resources centres etc. and can be effectively used - as teaching / learning aid, as a demonstration tool for showcasing potential of remote sensing data.