



JEarth | Analytical Remote Sensing Imagery Application for Researchers and Practitioners



Lela Prashad, Phil Christensen, Saadat Anwar, Betim Deva, Scott Dickenshied, Eric Engle, Dale Noss
School of Earth and Space Exploration, Arizona State University

Introduction

The ASU 100 Cities Project and the Mars Space Flight Facility (MSFF) are developing **JEarth**, a set of analytical GIS tools for viewing and processing Earth-based imagery and shapes including ASTER, Landsat, MODIS, and hyperspectral imagery such as TIRS. JEarth will be open source and can be easily installed.

JEarth is being created from existing MSFF tools: a Java application called **JMars** for viewing and analyzing remote sensing imagery and **THMPROC**, a web-based, interactive tool for processing imagery to create band combinations, stretches, and other imagery products.

We plan on testing JEarth through the CAP LTER user community with its current features and intend to build new functionality as JEarth develops. We welcome input and testers from the LTER community.

What is JMars?

Java-based open source GIS tool for analysis of all available Mars data sets

- Global datasets and individual images
- Regional maps and mosaics
- Shapefiles
- Hyperspectral data
- Data fusion and 3-D rendering tools
- Highly efficient mapservers and data transfer
- Runs on Windows, Mac, and Linux Platforms**
- Simultaneously display multiple datasets (such as maps, image footprints, numerical data products, etc) collected by instruments on several current and past NASA missions
- Currently receives over **25,000 unique users (recorded as IPs) a month.**
<http://jmars.asu.edu/>

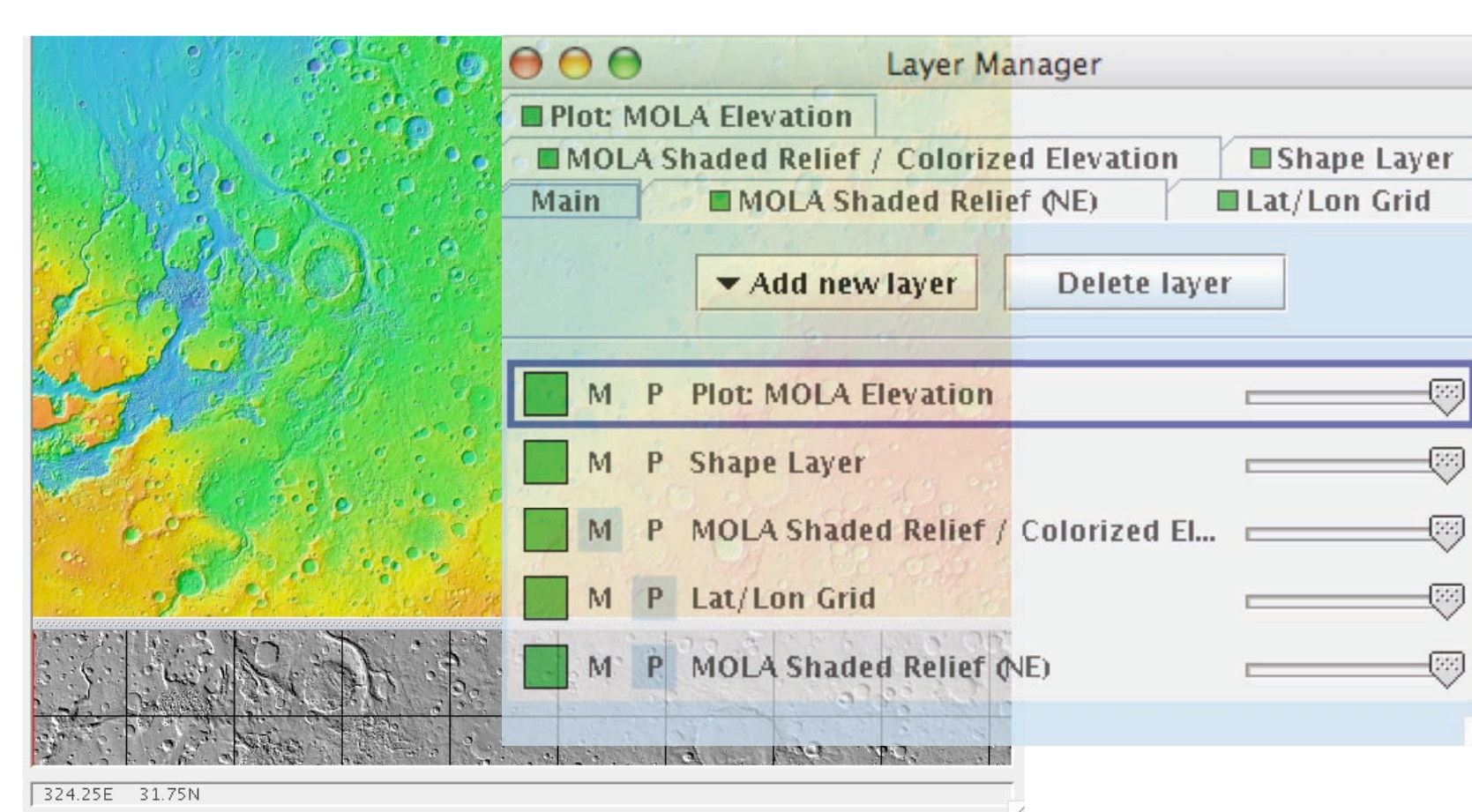


Adaptation of JMars to JEarth

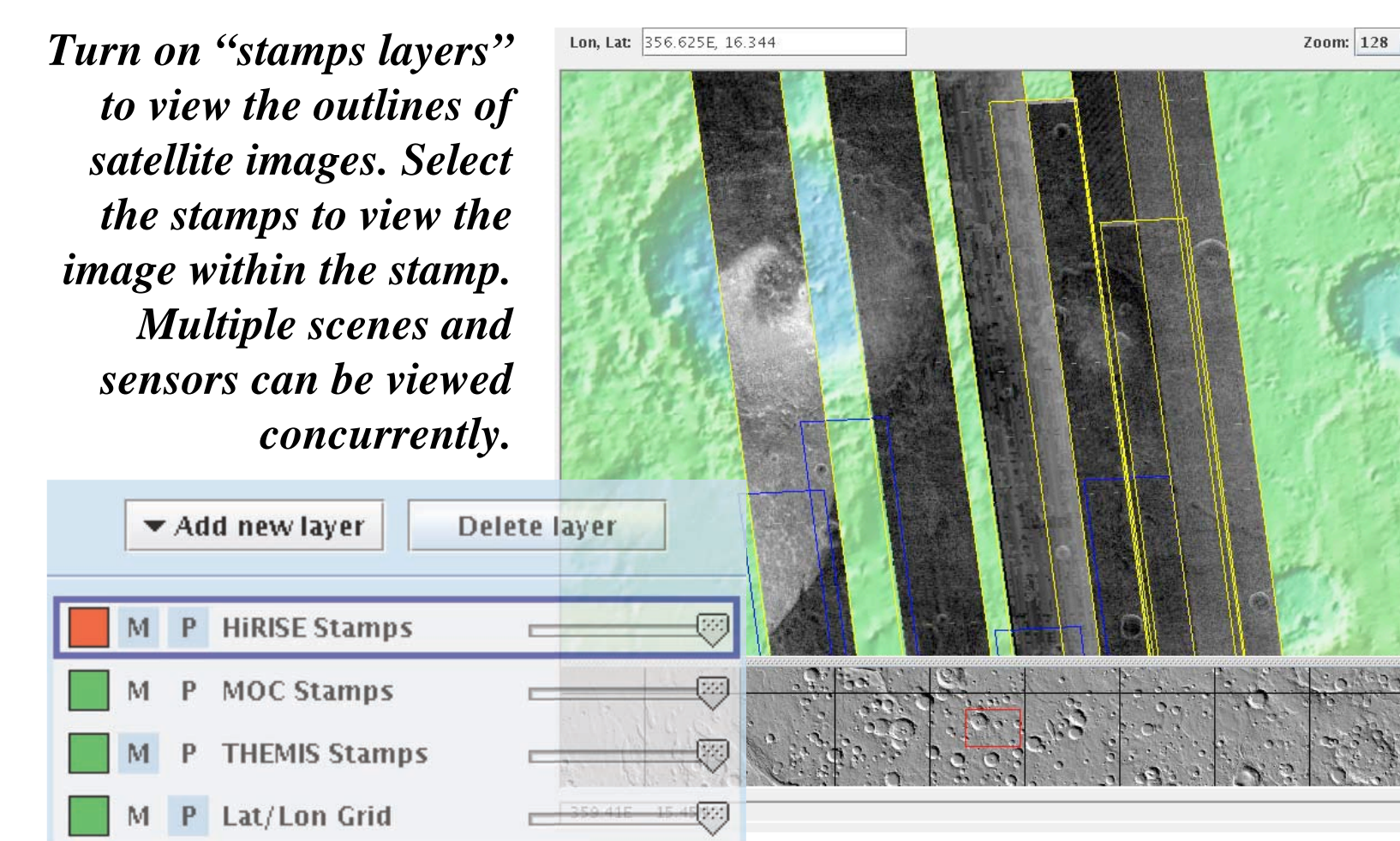
Core analysis tools in JMars can be applied to JEarth users with the inclusion of:

- Earth-based satellite and airborne imagery
- Digital elevation models - such as GTOPO30
- Vector-based shapefiles, including geology, ecology, social and political datasets

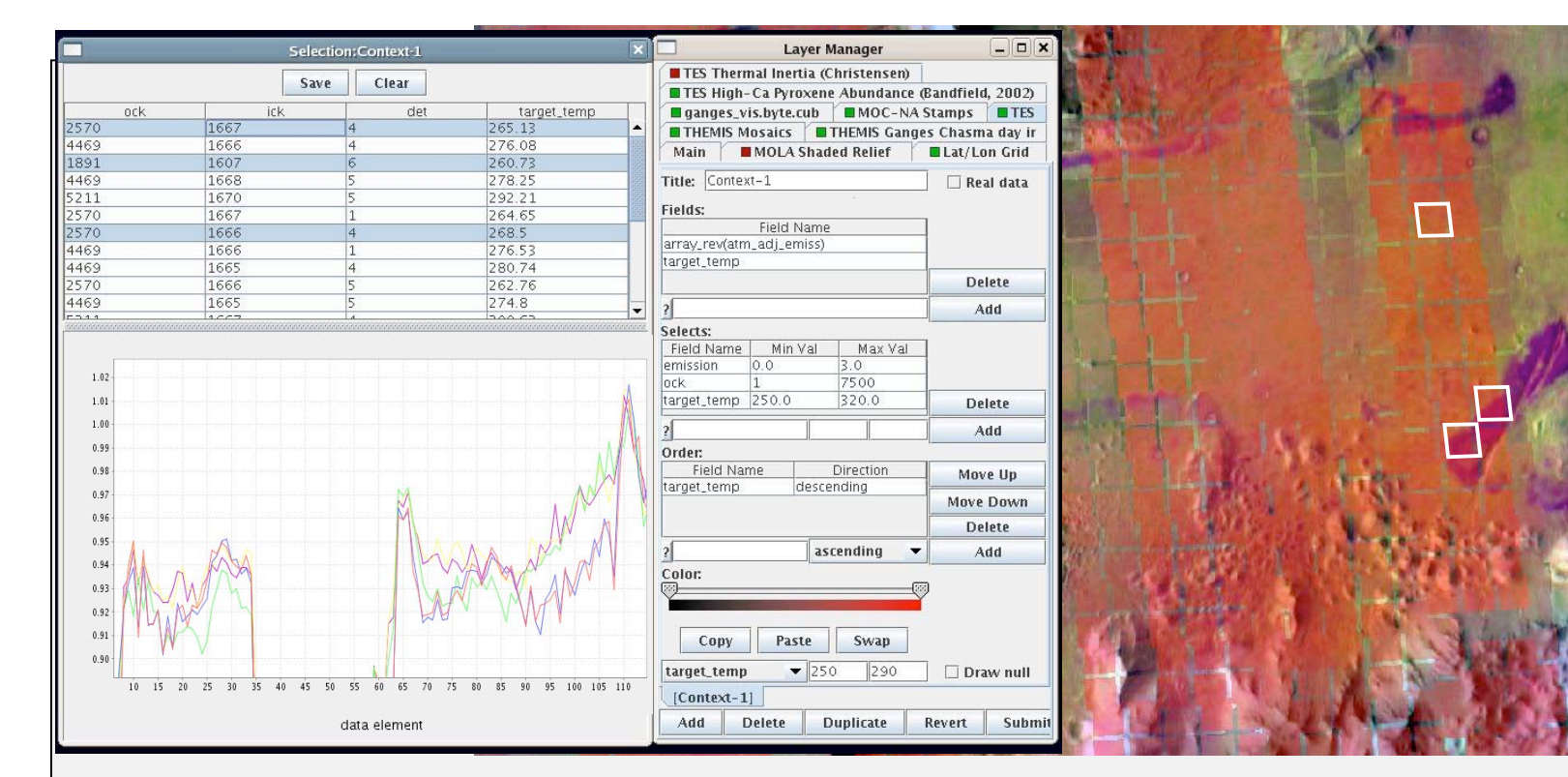
JEarth / JMars User Interface



Select data layers to view together in the map window. Layers can be rasters (imagery) or vectors (shapefiles). Layers can be made transparent to view multiple layers together



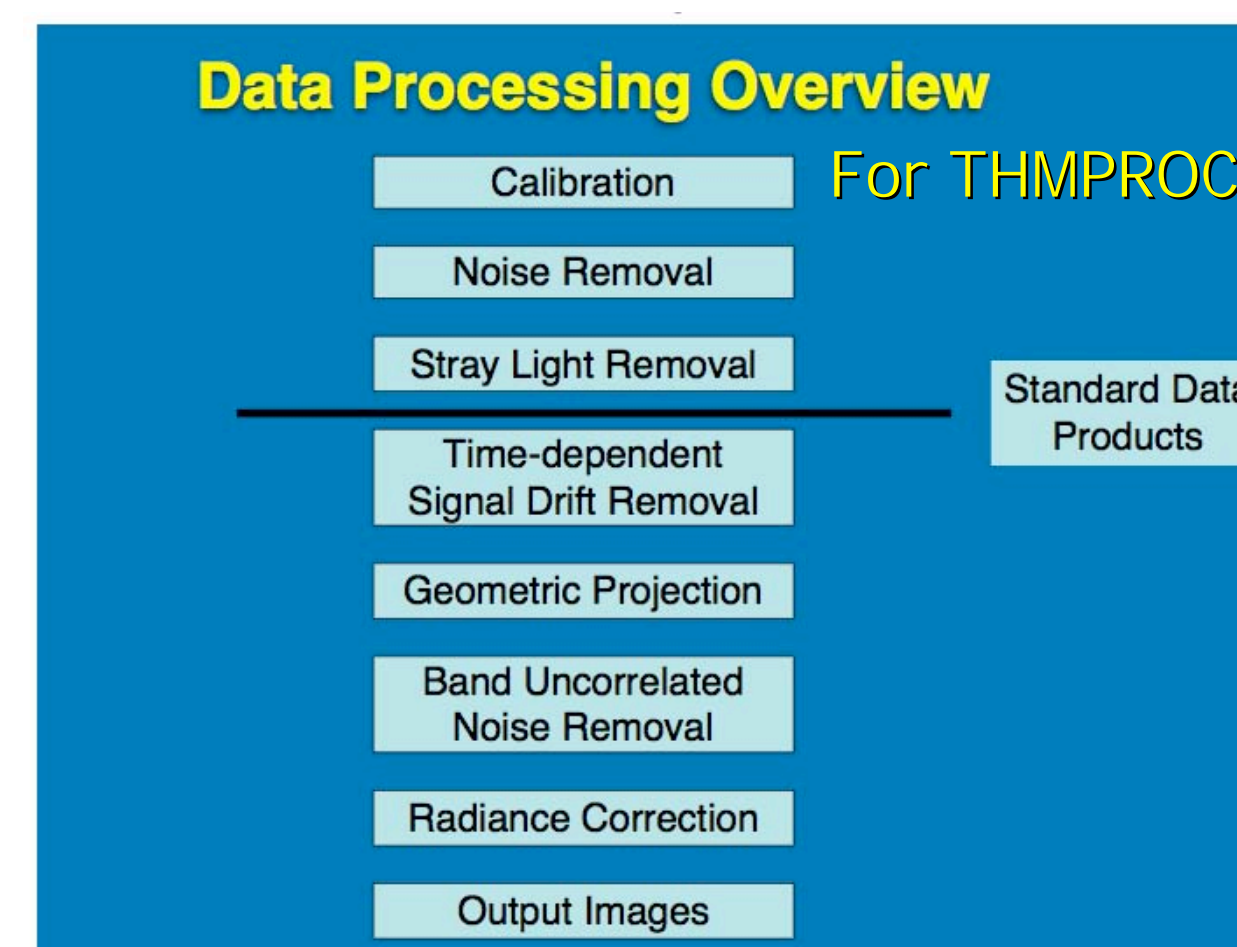
Turn on "stamps layers" to view the outlines of satellite images. Select the stamps to view the image within the stamp. Multiple scenes and sensors can be viewed concurrently.



Pixels in an image retain their data values. Complex analysis such as spectral analysis, elevation profiles, or querying pixel values, for a few examples, can be accomplished.

JEarth Initial Basic Features

- ASTER, Landsat, MODIS and other satellite and airborne imagery integration, including high-resolution imagery
- Ability to identify and query imagery data - such as vegetation, surface temperature, albedo, and LULC values
- Connection to NASA Earth satellite metadata and imagery through a connection to their new ECHO API for fast access to imagery without having to store it all locally
www.echo.eos.nasa.gov
- ASTER and GTOPO 30 DEMs and profile tools
- Incorporation of CAP LTER shapefiles for the 200 point survey and other datasets.
- Integration with MSFF NASA servers to display large data volumes quickly
- Processing of imagery on the fly to generate NDVIs, band combinations, and derivative images through the use of THMPROC with JEarth



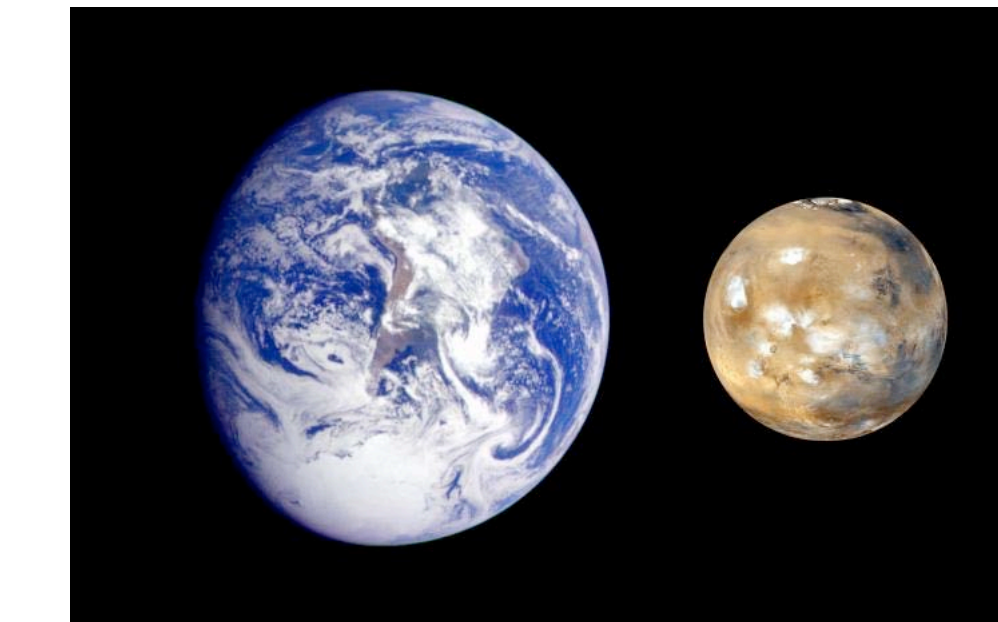
Users will be able to process imagery on-the-fly to create vegetation, temperature, albedo, or other products, and then import the images into JEarth. The program that processes the imagery is called THMPROC.
<http://themis.asu.edu/thmproc>

JMars currently implements this feature.

Developing JEarth with the CAP LTER User Community

Piloting JEarth with the LTER user community will help us refine its features for a diverse group of researchers working with remote sensing imagery on multiple levels.

In the future, we would like to fully connect to the CAP LTER database, as well as other LTER sites. New JEarth features may include a portal where researchers and practitioners could download data for further analysis, and upload their own datasets to contribute.



Input Needed

If you would like to be a tester as we develop JEarth, please send your name to the contact below.

Input will be needed to define datasets for inclusion, tailor the user interface for Earth users, and decide on new features as JEarth develops.

To try out the software now - go to <http://jmars.asu.edu/> and download JMars for Windows, Mac, or Linux.

Contact:
Lela Prashad
ASU 100 Cities Project
lprashad@asu.edu

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