

# CLASlite

## Forest Monitoring Technology

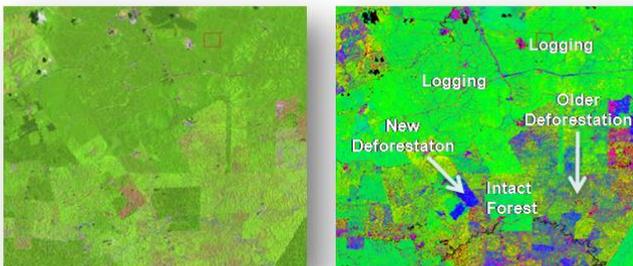
**CLASlite** – At a time when awareness of the role of forests in carbon storage, climate change mitigation, and biodiversity conservation has dramatically increased, the Global Ecology Department at the Carnegie Institution is advancing the science of mapping forests to support internationally policy discussions, and to respond with applied solutions that address on-the-ground needs for forest monitoring.

The Carnegie Landsat Analysis System-lite, or **CLASlite**, is a patented software package designed for highly automated identification of deforestation, forest degradation and forest regrowth from remotely sensed satellite imagery. **CLASlite** incorporates state-of-the-art research in remote sensing into a simple, user-friendly yet powerful tool for non-profit organizations and governments in need of technologies for forest monitoring and environmental planning.

The **CLASlite** Team's latest effort has expanded its software capabilities to Version 3.2, which supports ongoing international training and capacity building for regional- and national-level forest monitoring.

### The Power of CLASlite

The power of **CLASlite** rests in its unique ability to convert seemingly green "carpets" of dense tropical forest cover found in the basic satellite images into highly detailed maps that can be readily searched for deforestation, logging and other forest disturbance events and forest regrowth.



Raw Landsat Imagery

CLASlite Image

### What CLASlite Is and Is Not

**CLASlite** provides a highly automated system to convert satellite imagery from its original (raw) format, through calibration, pre-processing, atmospheric correction, and cloud masking steps, and then performs the patented *Monte Carlo Spectral Mixture Analysis* to derive high-resolution output images. Finally, **CLASlite** provides maps of forest cover, deforestation, degradation and regrowth from either automated or user-mediated decision tree classifiers.

**CLASlite** does not provide a final cartographic map of a region, but it does provide the interpretable and meaningful images that can be finalized into cartographic maps by the user.

**CLASlite** is accompanied by free software (ENVI Freelook<sup>®</sup> ITT Solutions Inc.) for use in viewing the input and output images for **CLASlite**.

### CLASlite v3.2 At-a-Glance

- ✓ It represents a scientifically robust, highly automated and user-friendly technology.
- ✓ It has been tested and used in tropical forests found on all continents throughout the world, and from island ecosystems to the global pan-tropics.
- ✓ It proves that monitoring no longer requires huge investments in computers or expertise.
- ✓ It generates information about the fractional cover of forest canopies, dead vegetation and soils – key information for land use decision-making and management.
- ✓ A full LANDSAT image (180 x 180 km) can be processed in minutes.
- ✓ Landsat 8, 7, 5, and 4, SPOT 4 and 5, ALI, and ASTER imagery are supported.
- ✓ The spectral libraries have been updated to cover a global tropical range of forest types, elevations and conditions.
- ✓ The decision-trees for deforestation and forest disturbance are improved and offer the user greater flexibility.
- ✓ It requires a PC (processor x86-64 (32 or 64 bits Windows 7 or 8)), 28 GB hard disk space, 2 GB RAM).
- ✓ Free licensing is granted to non-profit/non-commercial organizations based on external grants provided to the **CLASlite** Team.

Classification and further analysis of **CLASlite**'s output images can also be done using standard image analysis packages such as PhotoShop<sup>®</sup>, Arc/Info<sup>®</sup>, ArcGIS<sup>®</sup>, ArcView<sup>®</sup>, ERDAS<sup>®</sup> Imagine, ENVI<sup>®</sup>, and IDRISI<sup>®</sup>.

### Supporting Regional Capacities for Forest Monitoring

**CLASlite**'s capacity-building strategy aims to incorporate institutions whose work contributes to forest monitoring in tropical regions. The targeted audience is comprised of technicians who will operate the software, but also decision-makers and members of the scientific community who are key constituencies in the forest monitoring arena. Ongoing activities by the **CLASlite** Team include:

- *Production and dissemination of CLASlite scientific papers.*
- *Development of supporting materials including CLASlite's multilingual User Guide and website, and informative and technical flyers.*
- *Development of CLASlite training sessions online, planned for launch in late 2013.*
- *Incorporation of CLASlite in relevant existing networks and initiatives.*