



CEOS Visualization Environment (COVE) Status Report and Demo

Brian Killough (NASA, SEO)

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WGISS-34 and WGCV-35 Meeting
Hyderabad, India

CEOS Visualization Environment (COVE)

www.ceos-cove.org



CEOS VISUALIZATION ENVIRONMENT

COVE



The CEOS Visualization Environment (COVE) tool is a browser-based system that leverages Google-Earth to display satellite sensor coverage areas and identify coincidence scene locations for **more than 80 space missions**. The NASA CEOS System Engineering Office (SEO) worked with the Committee on Earth Observing Satellites (CEOS) Working Group on Calibration and Validation to develop the COVE tool.

www.ceos-cove.org



www.nasa.gov



www.ceos.org



www.ama-inc.com

info@ceos-cove.org

COVE Tool

Displays satellite sensor coverage areas and forecasts satellite coincidences

90+ missions

Recently had some great interactions with users at **IGARSS** in Germany.



COVE is FREE !!!

COVE Applications in CEOS



Several CEOS international projects are using **COVE**

- **Deforestation** (GFOI/FCT) ... Carbon and Urbanization
- **Agriculture** (GEOGLAM/JECAM) ... Food Security
- **Data Access** (SDCG, Portals) ... Space Data Use



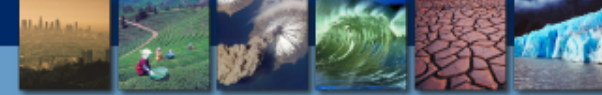
Working Group on Calibration and Validation

- Toz Golu, Turkey Campaign
- Antarctica DOME-C Campaign



There are many other (not shown here) Earth Science COVE users inside and outside the CEOS community using the tool for campaigns, data acquisition studies, etc.

COVE Features and Details



- Automated daily satellite position data from Analytical Graphics Inc. (AGI) **CelesTrak** database
- Saved bookmarks and states, Google-Earth KML and Shapefile compatibility, collaborative sessions
- **Output:** position, UTC time, viewing angles, solar angles, day/night, and EXCEL tables
- Large mission database: **94** missions, **153** Mission-Instrument combinations
- **NEW** Graphical Interface and website design

Rapid Acquisition Planning Tool for EXCEL output

User Discussion Forums

Bookmarks, Overlays, Import/Export tools

Google Earth groundtrack visualization

COVE Tool

Home About COVE Tool Rapid Acquisition Tool Mission & Instrument Browser Forum Help Log In View Full Screen

Africa | Antarctica | Asia | Australia | Europe | North America | South America

Missions and Instruments

Alphabetical By Constellation

NOVA-SAR - 490 km

COSI-SAR - 490 km

Landsat-5

TM - 185 km

Landsat-7

ETM - 185 km

LDCM (National)

TIRS - 185 km

Meteor-M

BRK Severyanin-M - 600 km

KMS - 900 km

Filter Filter (e.g. "ALOS" or "nasa")

Time Span 09/12/2012 to 09/13/2012

Add Coincidence Add Ground Swath

Cart Clear Cart

Landsat-7: ETM - 185 km

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

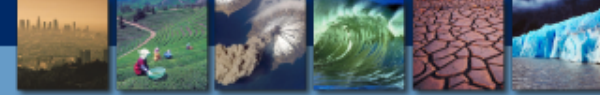
© 2012 Cnes/Spot Image

Image © 2012 TerraMetrics

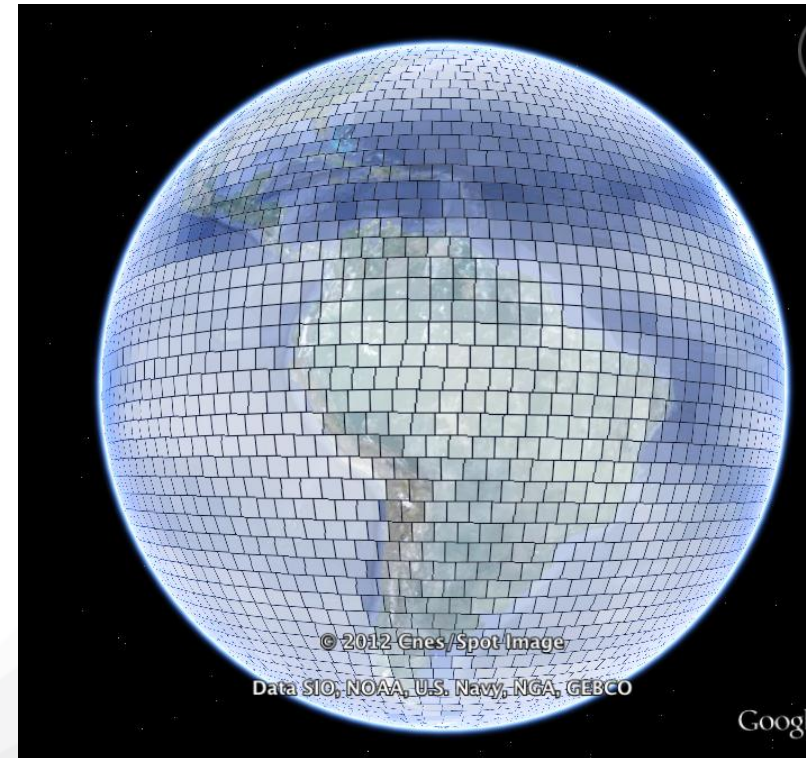
Google earth

Terms of Use

Cloud Modeling in COVE



- Recently met with NASA Atmospheric Scientists focused on cloud modeling and products. They suggested several past and future cloud datasets.
- **Past datasets** ... Plan to utilize a new NASA-developed CERES SSF dataset (12 year) ready in Jan 2013. Data will include near-global (60S to 60N latitude), hourly, 8-km spacing, cloud products up to 9 months from present. A similar “Flash Flux” product can be used for time periods from NRT to last 9 months. If needed, an AVHRR product (4-km spacing) is available back to 1978.
- **Future forecasts** ... Global average cloud cover can be forecasted from the NASA International Satellite Cloud Climatology Project (ISCCP) dataset (D2 product, 25 years, 280-km, 3-hour sampling, monthly averages). These overlays will be available in October 2012.



Sample ISCCP overlay in COVE showing the 280-km spacing of cloud cover data

Colombia Example – GFOI Data Planning



Optical Imaging:

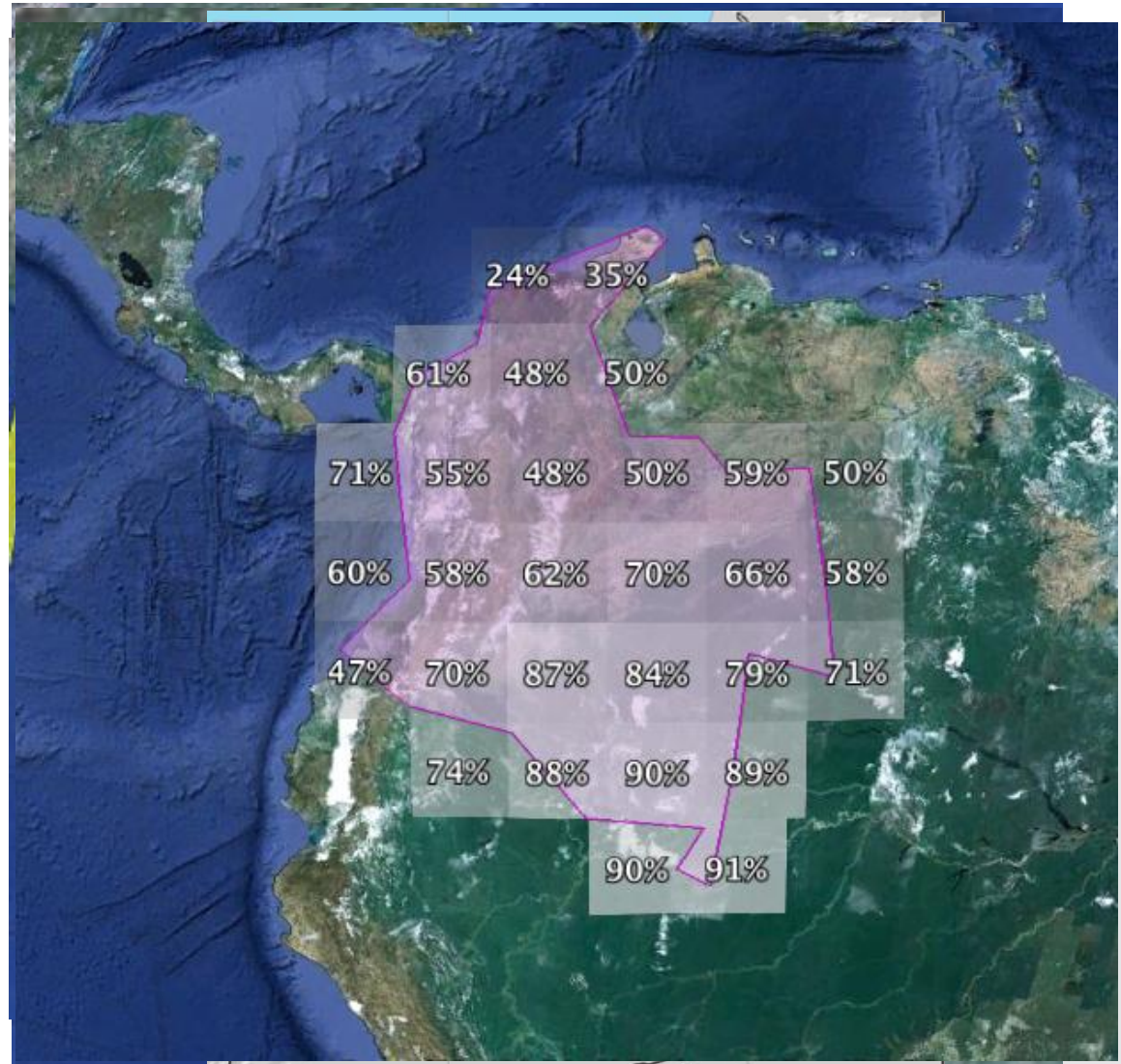
Landsat-7, ETM+

185-km swath, 16-day repeat
10:30am crossing

- (1) Colombia region
- (2) Forested Regions
- (3) **1-day** Landsat-7 coverage
- (4) **14 days** to cover Colombia (wall to wall)
- (5) Average cloudiness 24% to 91%.

Assuming 90% cloudiness in southern region, it will take an average of **140 days** (2.5 times per year) to cover Colombia with clear scenes.

Requirement: 1/year (min) mapping, Monthly (optimal) for Forest Change.



COVE Development Plans



Near-Term (end 2012)

- GlobCover (forested regions) and Cloud Cover (ISCCP monthly averages) overlays to support SDCG and data acquisition planning for GFOI.
- Move COVE to Amazon Cloud servers for improved performance and expansion.



Long-Term (end 2013)

- Expand the COVE mission database with more current and future missions as well as additional instrument modes and swaths.
- Expand the COVE user community for sharing and learning among diverse users. Recent IGARRS Conference in 2012 was a great start.
- Add data overlays for past cloud cover (CERES SSF) and Global DEM.
- Develop a mobile iPhone COVE application
- Create a Spanish version of COVE for Central and South America (sponsored by USGS). Perform training in developing countries to educate users on satellite remote sensing of the Earth.

