



FIRMS

FIRE INFORMATION FOR RESOURCE MANAGEMENT SYSTEM



Fire Information for Resource Management System (FIRMS)

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Overview of Presentation

1. Background
2. Introduction to FIRMS
3. Examples of how the data are being used to improve decision support systems
4. Next Steps



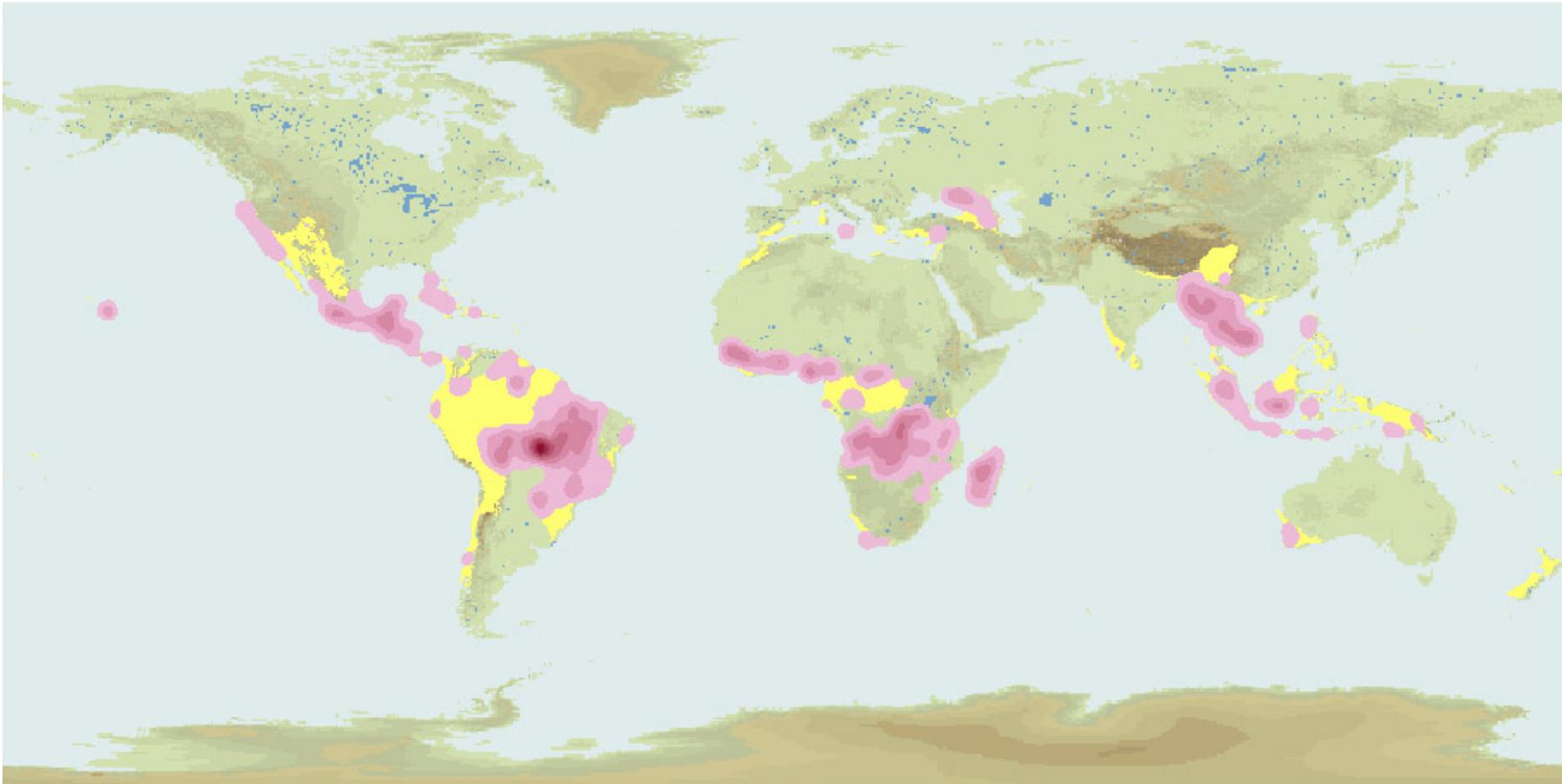


Overview of Presentation

1. Background – why the interest in fire?
2. Introduction to FIRMS
3. Examples of how the data are being used to improve decision support systems
4. Next steps



Density of active fires detected from MODIS (Terra)
within hotspot and wilderness areas:
November 2001 – October 2004



Density of fires



Low

Hot spots and wilderness areas

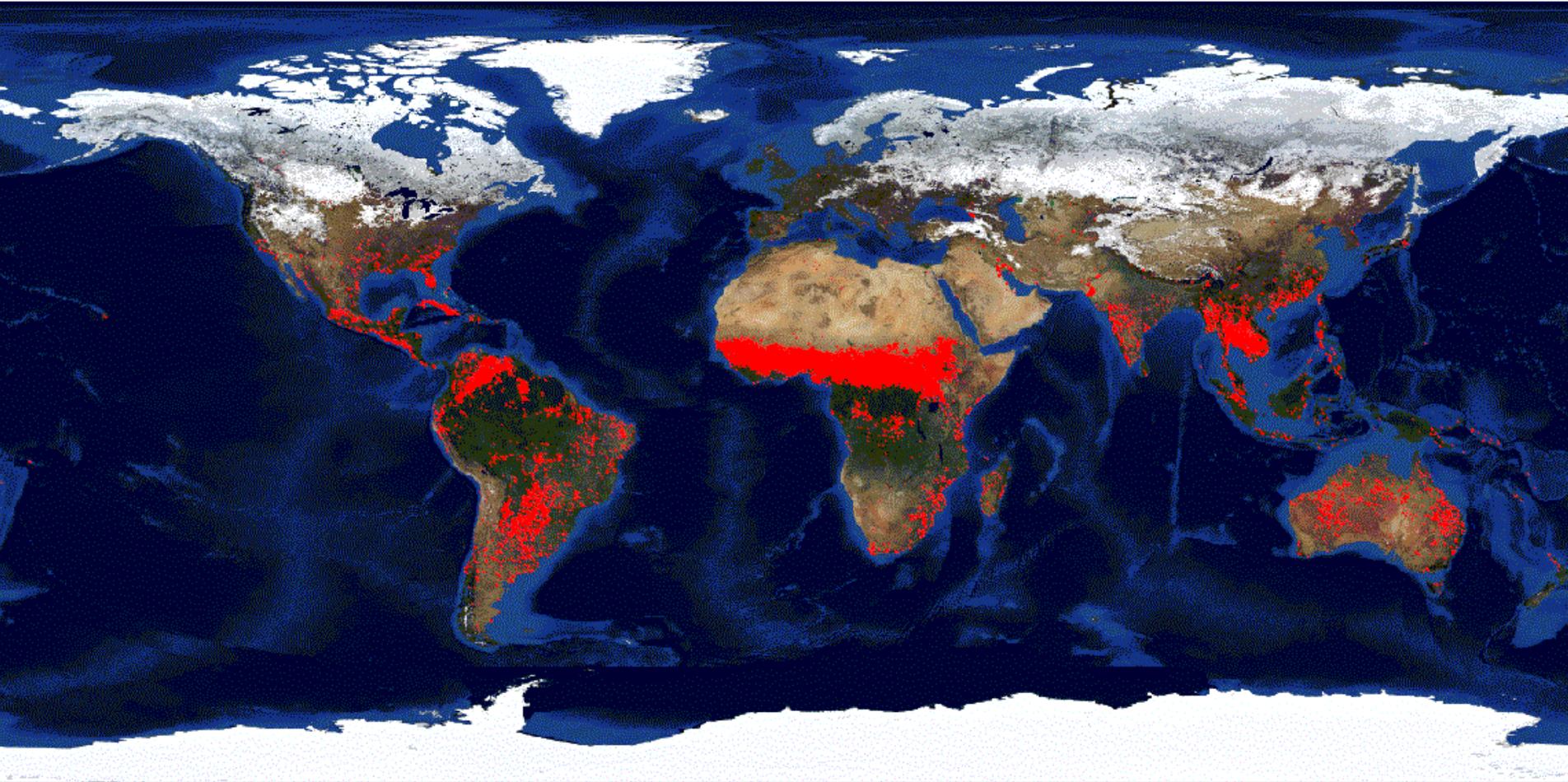
High

Burning Issues

- Fire is an established ecosystem process
- Fire - an effective land management tool
- The widespread use of fire has associated risks
- Uncontrolled fires can damage natural resources, diminish the range and diversity of species and erode forests
- Information on fire incidence can be used for strategic fire management, ecological studies and to inform policy



MODIS Rapid Response Fire Detections for 2004



JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

Get data to users rapidly, with small file size and in easy to use formats



2. Introduction to FIRMS-

FIRMS integrates remote sensing and GIS technologies to deliver MODIS fire data to natural resource managers around the world with a specific focus on protected areas

FIRMS is building on and enhancing Web Fire Mapper

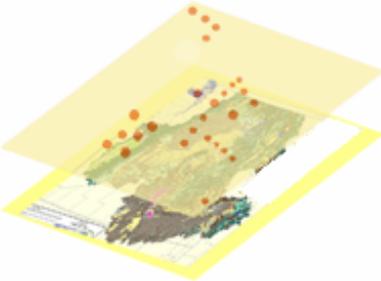
The goal ...to transition FIRMS to operational partners with a global monitoring mandate

- UN FAO in the Dept of Sustainable Development and Natural Resources
- Conservation International in Washington DC
- UNEP (Ashbindu Singh)



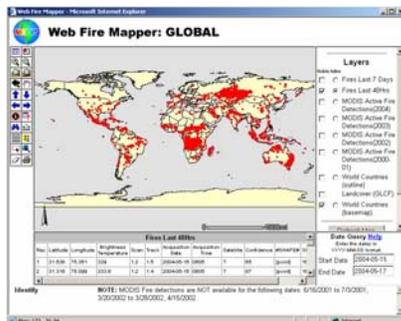
Overview of FIRMS Products

FIRMS delivers MODIS active fire locations in 4 ways:

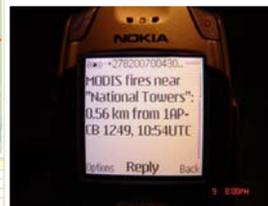
EMAIL ALERTS	WEB FIRE MAPPER	SHAPE FILES	MODIS Subsets
			

All of which are delivered in near real time (approx 2 hours after satellite overpass), with relatively small file sizes and in easily accessible formats

Overview of FIRMS data processing

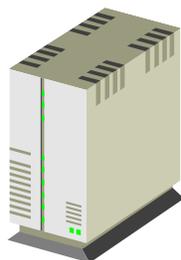
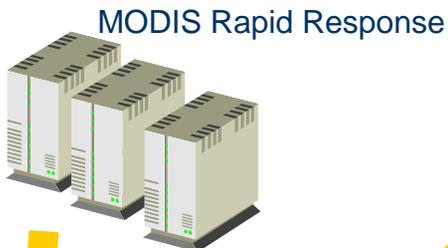


Interactive Web GIS Maps

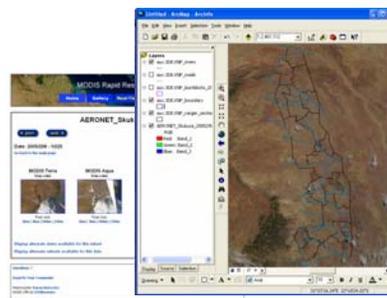


Email Alerts
Cell phone Text messages

EOS Data Operations System

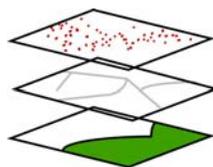


FIRMS



MODIS subset color composite images

Active Fire Locations
Burned Area Product



Downloadable shape files and text files

Supporting Protected Area Management

Strategic Fire Management: to control or suppress fires

Establish fire record to help formulate fire policy

Early Warning Disaster Management

Ecological Monitoring

Validating fire risk maps

Prioritization of resources
Analyze fire responses & staffing levels

Modeling fire emissions

Identify poaching activity

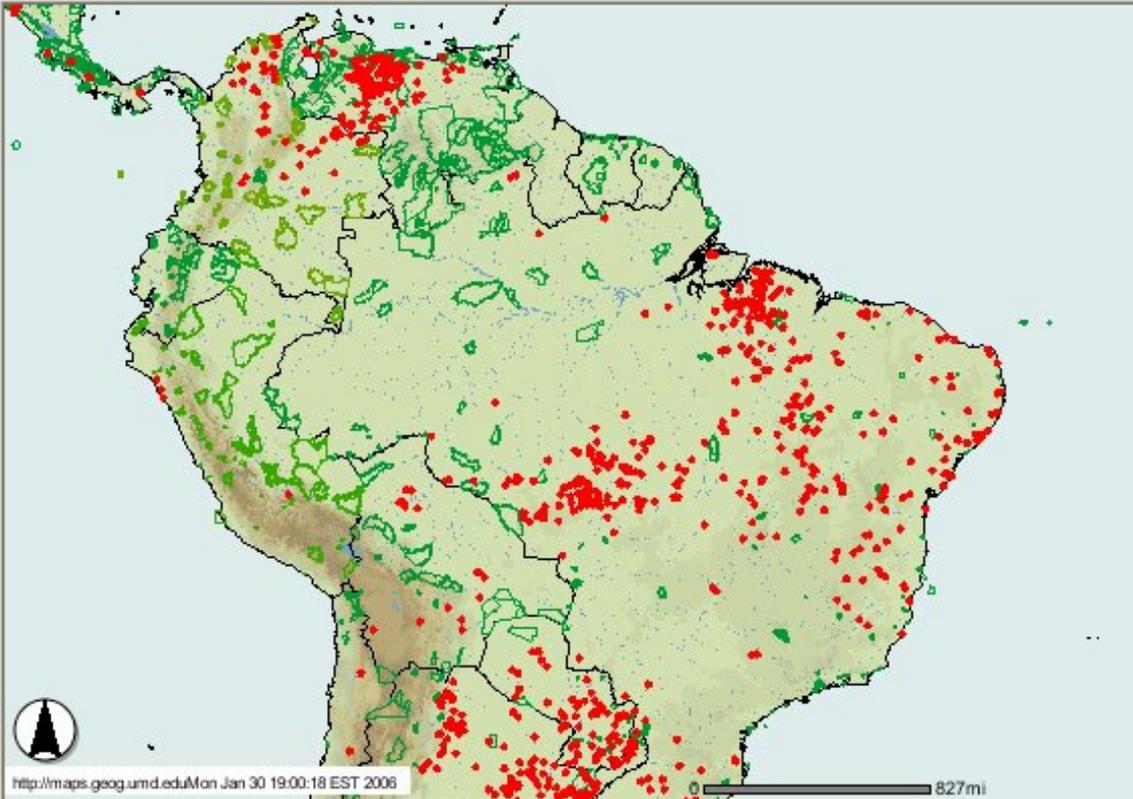
Overview of FIRMS Products: Web GIS

http://maps.geog.umd.edu - ArcIMS Viewer - Microsoft Internet Explorer




Web Fire Mapper: South America





http://maps.geog.umd.edu Mon Jan 30 19:00:18 EST 2006 827mi

Refresh Map | Show Legend

- Active Fire Detection
 - Fires Last 48Hrs
 - Fires Last 7 Day
 - Fire 2006
 - Fire 2005
 - Fire 2004
 - Fire 2003
 - Fire 2002
 - Fire 2001
 - Fire Nov-Dec 2001
 - Fire Detections
- Vectors
 - Countries
 - Country-Outline
 - World Cities (ES)
 - Protected Areas

Fires Last 48Hrs

Rec	Latitude	Longitude	Brightness	Scan	Track	Acqdate	Time	Satellite	Confidence	#shape#	Fid	Area
1	9.852	-67.683	325.5	1	1	2006-01-30	1505	T	71	[polygon]	1309	0.0001
2	9.851	-67.674	328.7	1	1	2006-	1505	T	78	[polygon]	1310	0.0001

Date Query [\[Help\]](#)

Enter as YYYY-MM-DD

Start Date

End Date

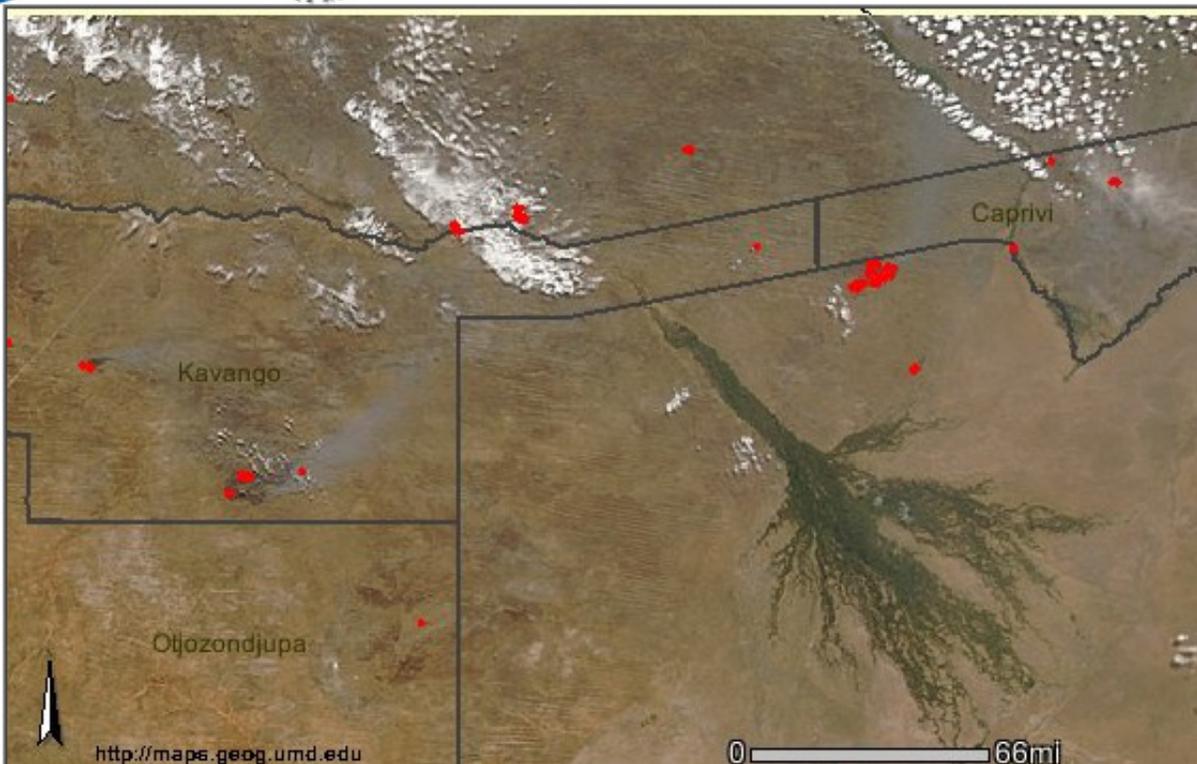
[Display Fires](#)

Identify

javascript:window.parent.TOCFrame.updateLayers();
Internet



Web Fire Mapper: Namibia



Layers

Visible Active

- Fires Last 48Hrs
- Fires Last 7 Days
- MODIS Active Fire Detections(2004)
- MODIS Active Fire Detections (Archive)
- Major Towns
- Towns
- Trunk Roads
- Roads
- Rivers
- Regions
- Protected Areas
- Biomes

Fires Last 48Hrs

Rec	Latitude	Longitude	Brightness Temperature	Scan	Track	Acquisition Date	Acquisition Time	Satellite	Confidence	#SHAPE#	SI
1	-18.972	20.105	340.1	1.5	2.3	2004-09-23	0825	T	92	[polygon]	1
2	-18.975	20.126	337.2	1.5	2.2	2004-09-23	0825	T	89	[polygon]	1

Date Query Help
Enter the dates in YYYY-MM-DD format.

Start Date

End Date

Pan **NOTE:** MODIS Fire detections are NOT available for the following dates: 6/16/2001 to 7/3/2001, 3/20/2002 to 3/28/2002, 4/15/2002.

Overview of FIRMS Products: Web GIS

The screenshot displays the FIRMS Web Fire Mapper interface. At the top left, the University of Maryland logo and the text "FIRMS" are visible, with "WEB FIRE MAPPER" below it. The main area is a global map showing fire activity with a color scale from white (low) to red (high). A search bar and navigation tools are on the left. On the right, a control panel includes a "Link to this page" button, a "Fires" layer selector, a time selection menu (Today, Past 48 hours, Past 72 hours, Past 7 days, Custom), start and end date fields (2006-01-01 to 2006-12-31), and a list of map features: Regions, Images, Layers, Download, and Activity Log.

New Web Fire Mapper prototype

Overview of FIRMS Products: Email Alerts

Great to be able to check the Internet for fires – but even more convenient to get a message in your inbox

3 ways to specify your area:

- Using an Interactive Map
- Select Protected Area, with buffer option
- Select by country

Options:

- JPEG image or a link to the image
- CSV file containing fire locations (easily imported in to local GIS)
- Background imagery

[Global Fire Email Alerts Home](#)

GLOBAL FIRE EMAIL ALERTS [Beta 3.0]

CHOOSE YOUR AREA-OF-INTEREST

[1] CHOOSE AN AREA INTERACTIVELY WITH MAP

Countries Fires Protected Areas [Problems with map?](#)



MODIS Active Fire Detections (last 48 hours) are shown in red

CONTACT INFORMATION

NAME:

Organization:

Country:

E-Mail:

CHOOSE YOUR MAP / EMAIL CONFIGURATION

Output Map Size:

Background Image:

Email Preferences: Attach [Comma-Separated File](#) with Fire Points to the Email

Language Preference:

SUBSCRIBE* TO RECEIVE E-MAIL

Send Email Confirmation for this Subscription

* YOUR SUBSCRIPTION DETAILS WILL NOT BE SHARED, DISCLOSED, OR DISTRIBUTED TO THIRD PARTIES.

-- OR --

[2] CHOOSE A COUNTRY OR A PROTECTED AREA

This material is based upon work supported by the National Aeronautics and Space Administration under Cooperative Agreement No. NNS06AA04A issued through the Decision Support Program.



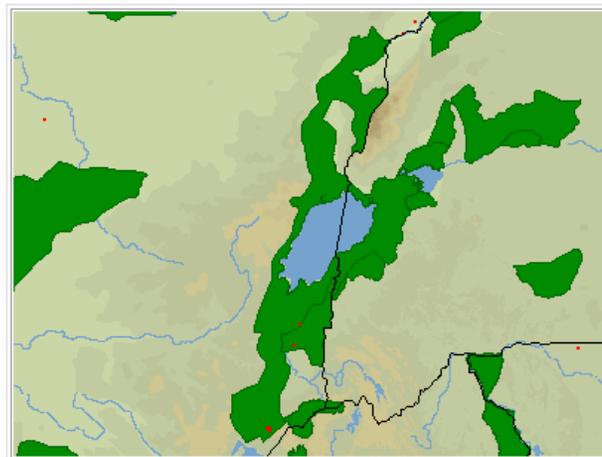
The MODIS active fire data is provided by the MODIS Rapid Response System. For more information about MODIS Rapid Response, see <http://rapidfire.sci.gsfc.nasa.gov>

For questions or comments, [contact us](#)

Sample email alert for Virunga National Park, Democratic Republic of Congo

Global Fire Alerts [Beta 3.0]

[View Your Subscriptions](#) • [FIRMS Home](#) • [FAQ](#)



Your Area of Interest (Protected Area) : Virunga ~ (IUCN: II) (Democratic Republic of the Congo), including a buffer of 10 KM

Fires detected over the past 48 hours in your area-of-interest : **8**

(NOTE: Cloud cover might obscure active fire detections. The fire points will be listed only when the total number of active fires detected is less than or equal to 50)

This email was generated on 2007-03-29 , 14:20:21 GMT.

If you have any questions or comments, go to the Frequently Asked Questions (<http://maps.geog.umd.edu/firms/faq.asp>) or contact the FIRMS Team. To query the full active fire database for your area, go to FIRMS Home (<http://maps.geog.umd.edu/>). Please read the disclaimer below.

[SATELLITE: A = Aqua; T = Terra; ACQDATE = Acquired Date.]

LATITUDE	LONGITUDE	CONFIDENCE	ACQDATE	TIME	SATELLITE
-0.8800	29.4380	40.0000	2007-03-27	0855	T
-1.0040	29.3950	69.0000	2007-03-27	0855	T
0.8900	30.0570	59.0000	2007-03-27	1150	A
-1.5290	29.2470	84.0000	2007-03-28	2020	T
-1.5170	29.2570	100.000	2007-03-28	2020	T
-1.5190	29.2460	100.000	2007-03-28	2020	T
-1.5180	29.2510	100.000	2007-03-28	2315	A
-1.5200	29.2630	100.000	2007-03-28	2315	A

Disclaimer: MODIS Rapid Response (MRR) and the University of Maryland (UMD) do not warrant that any data, database, or other information generated by use of the data or database will be error-free. The data is provided "as is" and MRR and UMD make no representations or express or implied warranties of any kind, including but not limited to any implied warranties of merchantability or fitness for a particular purpose. The recipient institution agrees that it shall not make any warranties pertaining to the data or databases to any third party on MRR's or UMD's behalf.

Sample Spanish email alert for Brazil

Alerta FIRMS: Incendios en su área de interés - Message (HTML)

File Edit View Insert Format Tools Actions Help

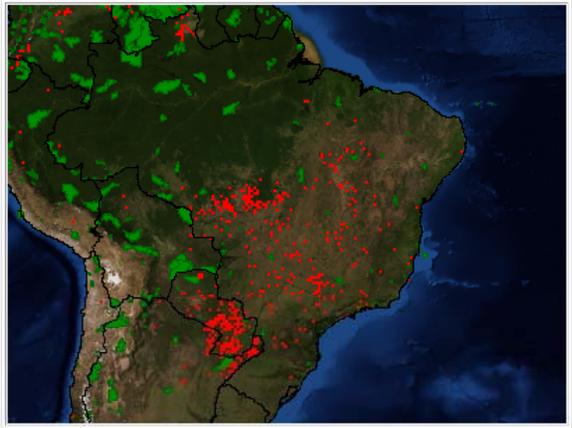
Reply Reply to All Forward

You forwarded this message on 3/29/2007 10:45 AM.

From: **FIRMS** Sent: Thu 3/29/2007 10:31 AM
To: Minnie Wong
Cc:
Subject: Alerta FIRMS: Incendios en su área de interés
Attachments: FirePoints-032907-988.csv (21 KB)

Alertas Globales de Incendios [Beta 3.0]

[Vea sus subscripciones](#) • [FIRMS Home](#) • [FAQ](#)



Su área de interés (País) : Brazil

En las últimas 48 horas, total de fuegos activos fueron detectados dentro de su área de interés : **513**

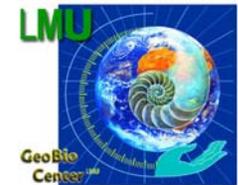
(NOTA: Cobertura nublar puede obstaculizar detección de fuegos activos. Los puntos de fuego solo serán puestos en la lista cuando el número total de fuegos activos son menor que 50)

Este correo electrónico fue generado 2007-03-29 , 14:31:27 GMT.

Si usted tiene alguna pregunta o comentarios, dirijase a Preguntas más Frecuentes (<http://maps.geog.umd.edu/firms/faq.asp>) o contacte Equipo FIRMS . Para realizar una búsqueda completo en la Base de Datos de fuegos activos en su área, dirijase a FIRMS Inicio (<http://maps.geog.umd.edu/>). Favor de leer el Limitación de responsabilidad en la parte inferior de esta hoja.

Limitación de Responsabilidad: Respuesta rápida de MODIS (MRR) y la Universidad de Maryland (UMD) no garantizan que los datos, base de datos, u otra información generada por el uso de los datos o de la base de datos, estén exentos de errores. Los datos son proporcionado "tal cual" y MRR y UMD no hacen representaciones ni garantías expresas o implícitas de ninguna clase, incluyendo pero no limitado a cualquier garantía tácitas de venta o de la aptitud para un propósito en particular. La institución receptora estará en acorde que no garantizará que se refiere a datos o bases de datos a terceros en nombre de MRR o de UMD.

Current subscribers to the Email Alerts program



Overview of FIRMS Products: Shape files, Google KML files and WMS services

Active fire data is also available as text files via the ftp site



FIRMS

FIRE INFORMATION FOR RESOURCE MANAGEMENT SYSTEM

FIRE INFORMATION FOR RESOURCE MANAGEMENT SYSTEM

- Home
- About
- Web Fire Mapper
- Email Alerts
- Active Fire Data
- MODIS Subsets
- Resources
- FAQs
- Contributors
- Links

Active fire Text files

Daily active fire text files are available for the last 2 months from the following ftp site:
<ftp://mapsftp.geog.umd.edu>

Active fire Shape files

Active fire shape files are available for the last 48 hour and 7 day time period. Each of the shape files are updated every day at 7:00 AM, 11:45 AM, 3:45 PM and 7:45 PM EST. The files have been zipped to reduce download size. Please use any valid compression software to extract the contents. The size of the files vary each day in accordance to the number of fires, in general the zipped file size should range anywhere between 3 KB to 3.0 MB.



The image gives the geographic extent of each of the subsets. Please download the shape file corresponding to your region of interest.

Shape files are available for the following regions:

Australia	South Africa	Central and South America	Europe	North America	South East Asia	Central and North Africa	Global	Russia
48 Hours	48 Hours	48 Hours	48 Hours	48 Hours	48 Hours	48 Hours	48 Hours	48 Hours
7 day	7 day	7 day	7 day	7 day	7 day	7 day	7 day	7 day

Please [contact us](#) if you are interested in accessing historical active fire data.

This material is based upon work supported by the National Aeronautics and Space Administration under Cooperative Agreement No. NNS06AA04A issued through the Decision Support Program.






The MODIS active fire data is provided by the MODIS Rapid Response System. For more information about MODIS Rapid Response, see <http://rapidfire.sc.gsfc.nasa.gov>

For questions or comments, [contact us](#)

Search

Fly To Find Businesses Directions

e.g., Hotels near JFK

▶ ◻ ✕

Places

- My Places
- Temporary Places
- South America MODIS Fires
Fires detected in the past 48 hours. This document
- Fire Points List

Layers

View: Core

- Primary Database
- Terrain
- Geographic Web
- Featured Content
- 3D Buildings
- roads
- borders
- Populated Places
- Alternative Place Names
- Dining
- Lodging
- Google Earth Community
- Shopping and Services
- Transportation
- Geographic Features
- Travel and Tourism
- Parks and Recreation Areas
- Community Services
- US Government
- Digital Globe Coverage



Navigation controls including a compass rose with 'N' for North, a scale bar, and zoom in (+) and zoom out (-) buttons.

Overview of FIRMS Products:

MODIS

The screenshot shows the ArcMap interface with the following elements:

- Title Bar:** Untitled - ArcMap - ArcInfo
- Menu Bar:** File, Edit, View, Insert, Selection, Tools, Window, Help
- Toolbar:** Standard GIS navigation and editing tools.
- Layers Panel:**
 - aux.SDE.KNP_rivers (Blue line)
 - aux.SDE.KNP_roads (Yellow line)
 - aux.SDE.KNP_burnblocks_2C (Purple square)
 - aux.SDE.KNP_boundary (Black outline)
 - aux.SDE.KNP_ranger_section (Black outline)
 - AERONET_Skukuza_200529€ (Red dots)
- Legend:**
 - RGB
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3
- Main Viewport:** A satellite image with the above layers overlaid. The rivers are shown as blue lines, and AERONET stations as red dots.
- Scale:** 1:2,461,112
- Navigation:** A vertical toolbar on the right side of the viewport.
- Bottom Panel:** Display, Source, Selection buttons and playback controls.

0/25
n
om - View Aqua image
(S users)
is day

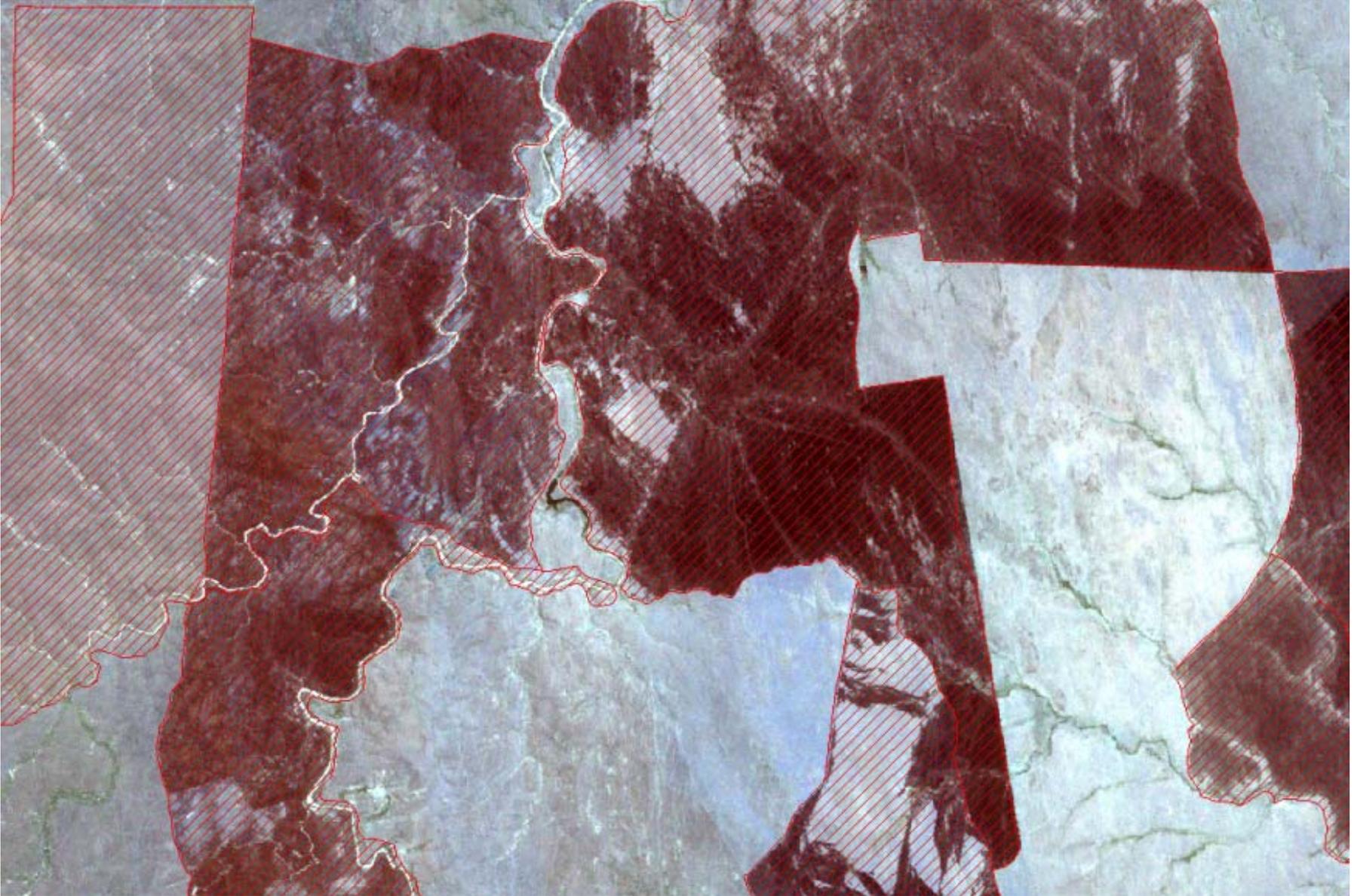
This block shows a smaller satellite image of the same coastal region as the main map, with red dots indicating AERONET stations. The text to the left of the image is partially cut off.

MODIS Subsets are used to improve ranger estimates of burned areas



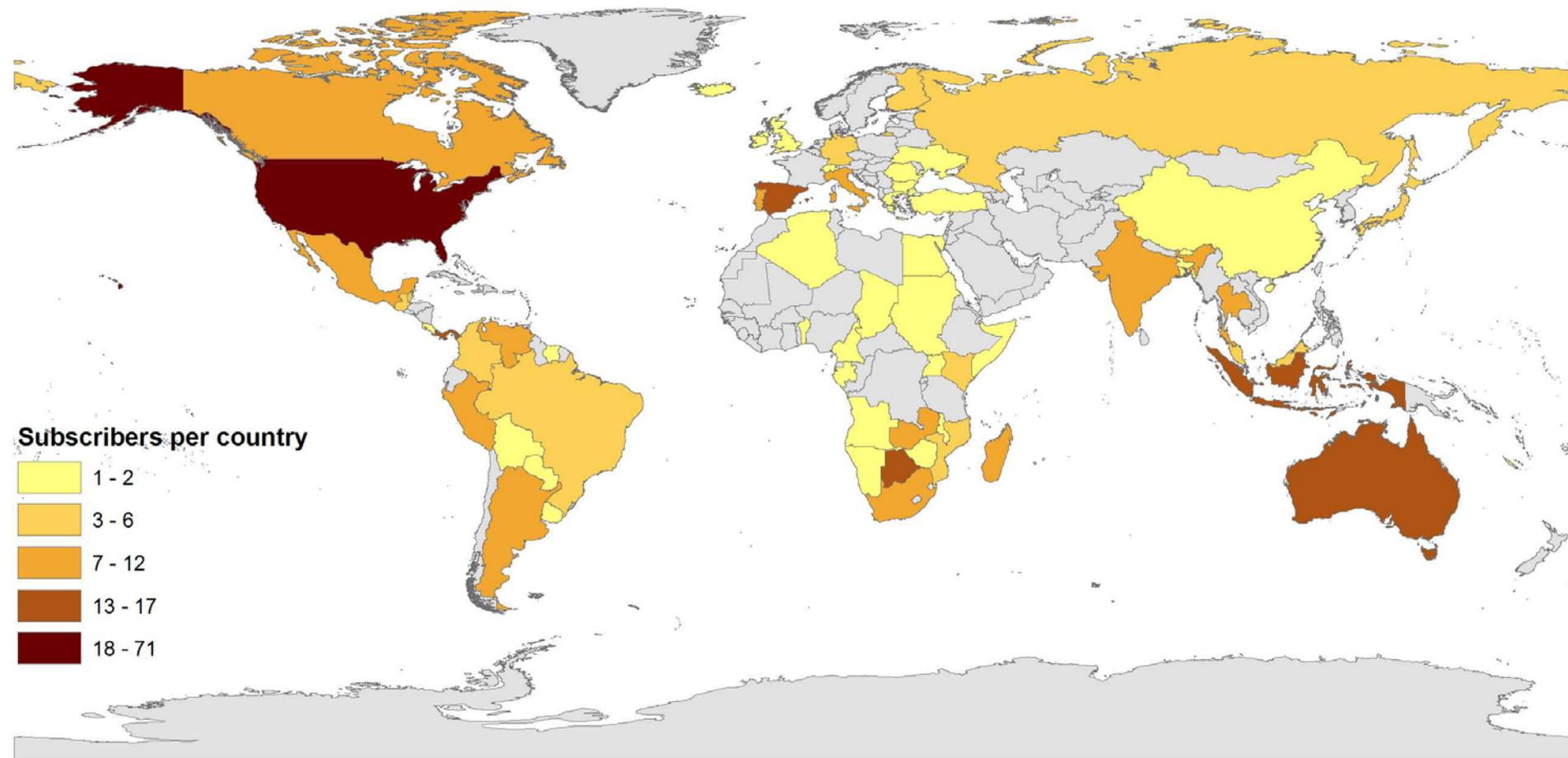
Source: Dave Woods, Kruger National Park

Improved burned area map



Source: Dave Woods, Kruger National Park

FIRMS sends out more than 700 emails a day to users in 62 countries



This map shows the number of unique users, by country that regularly access the MODIS fire data through FIRMS (updated March 2007)



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In Riau, Sumatra: WWF use MODIS active fire data engage big companies who are burning illegally.

Part of their 'Eyes on the Forest program'

"Everything is covered in smog. The media are calling us to get the latest information on where the fires are burning. We want to relate the hot spots to our map with the concessions of the big forest conversion corporations so we can engage them. Your web site has been proven to be the most useful resource on the web to do this."

Arif Budiman, GIS Manager, Feb 04

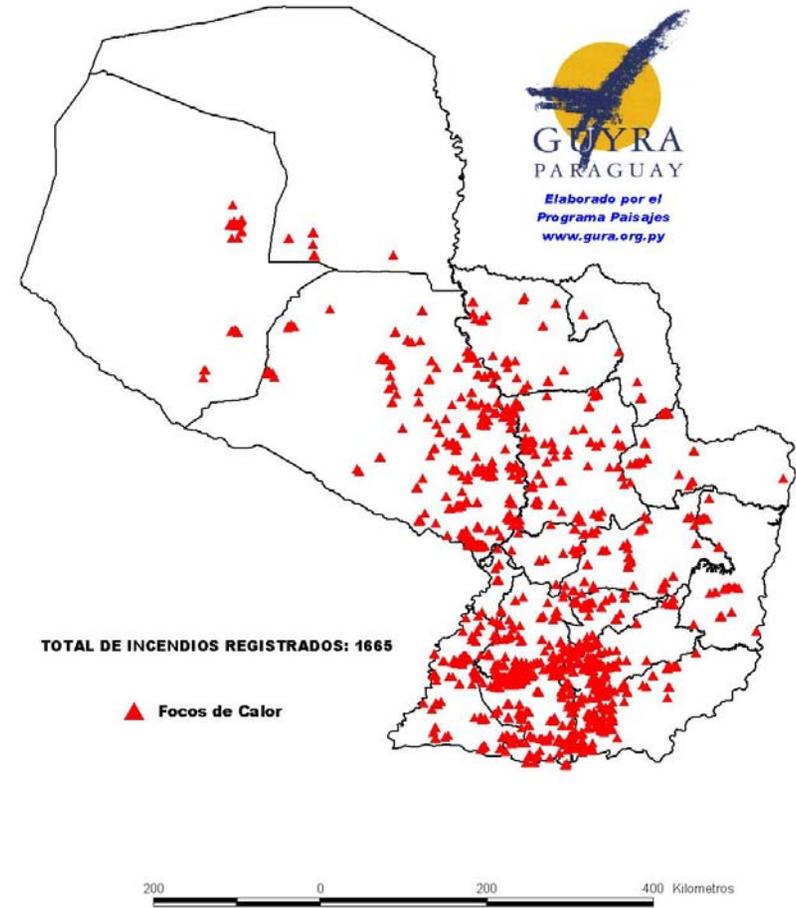
Fires and smoke on Sumatra, Indonesia

(Source: MODIS Rapid Response 2005/176 - 06/25 at 03 :55 UTC Satellite: Terra)



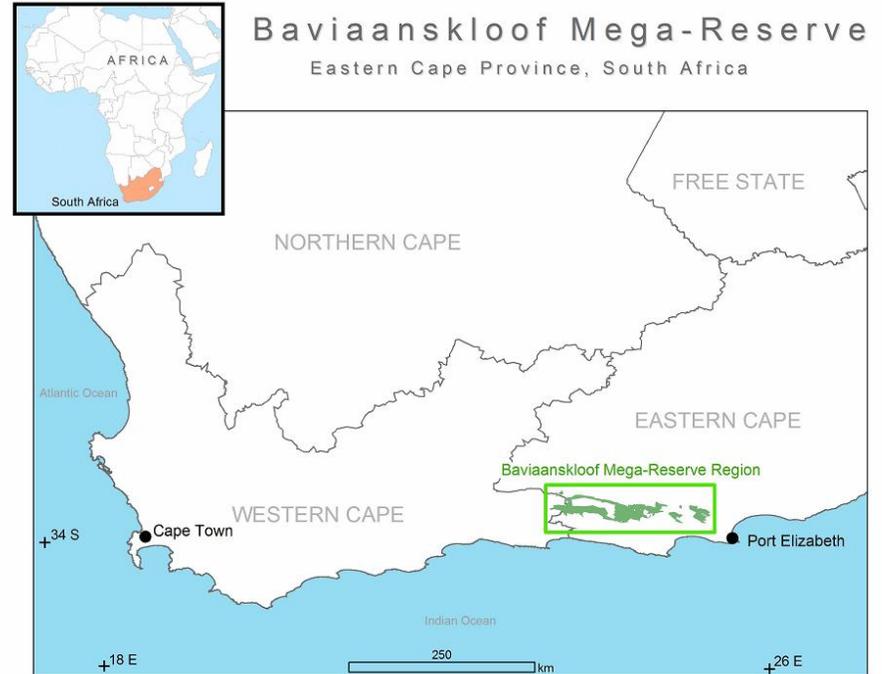
San Rafael - South Eastern Paraguay

**INCENDIOS REGISTRADOS DENTRO DEL PARAGUAY
ENTRE EL 2 DE MARZO HASTA EL 4 DE MARZO**



**CONSERVATION
INTERNATIONAL**

Photo Credit: Guyra Paraguay and Oscar Rodas, Conservation International



Baviaanskloof Conservation Area - mountainous and the terrain 'rather inaccessible'

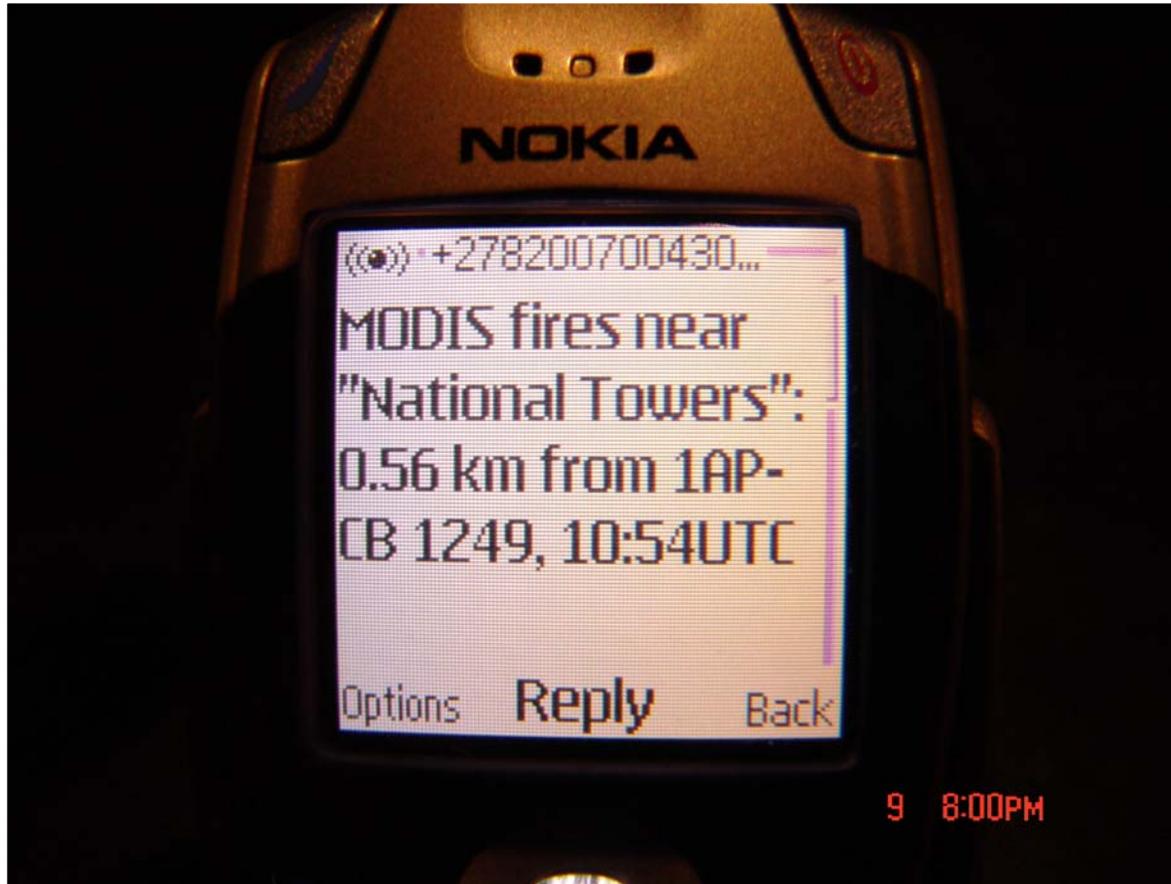
“budget constraints and lack of technical capacity satellite applications have remained out of reach. But with the Web Fire Mapper that has changed”

Andrew Skowno, Ecologist and Conservation Planner, Baviaanskloof Mega-Reserve Project



Cell phone text messages

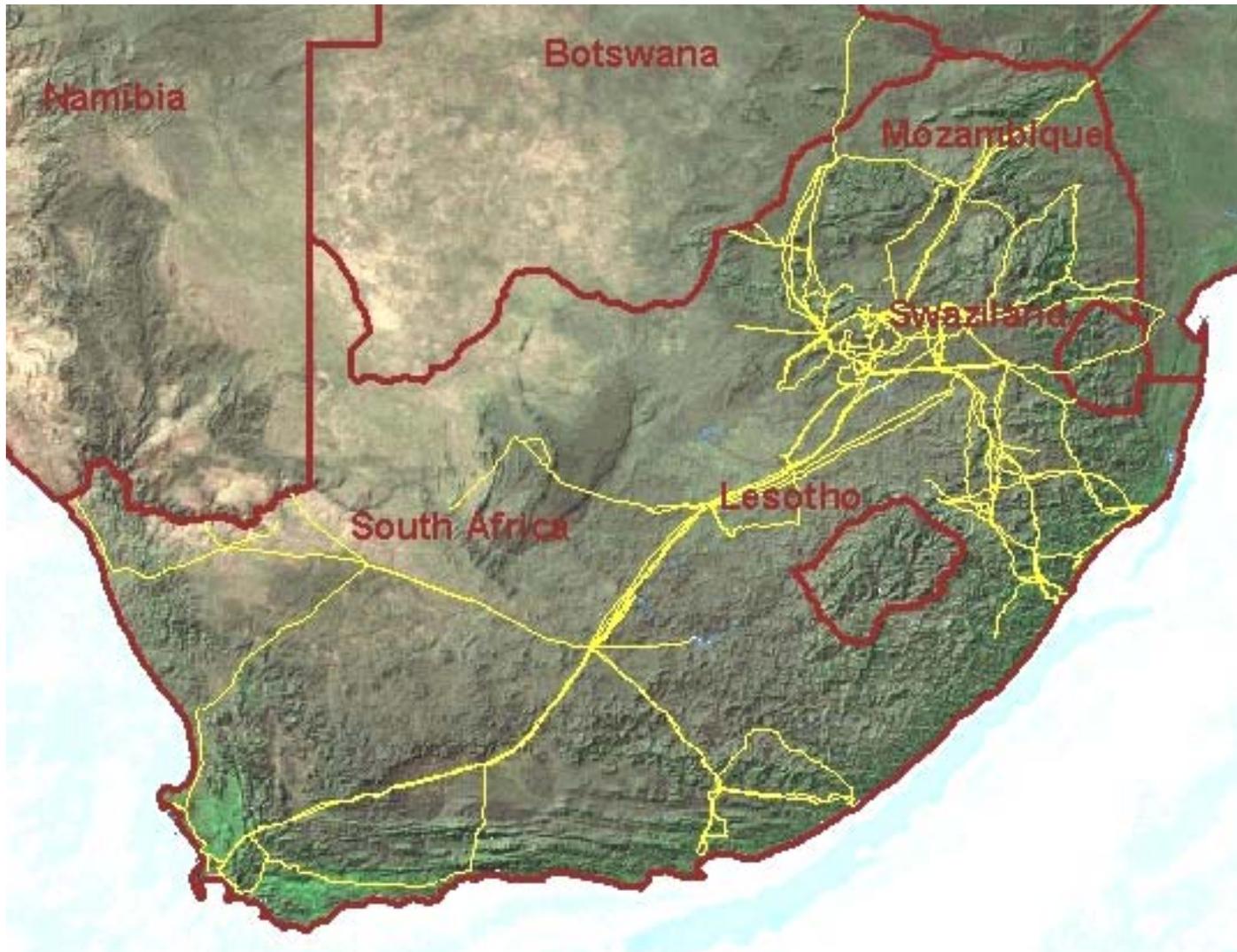
For people in the field...

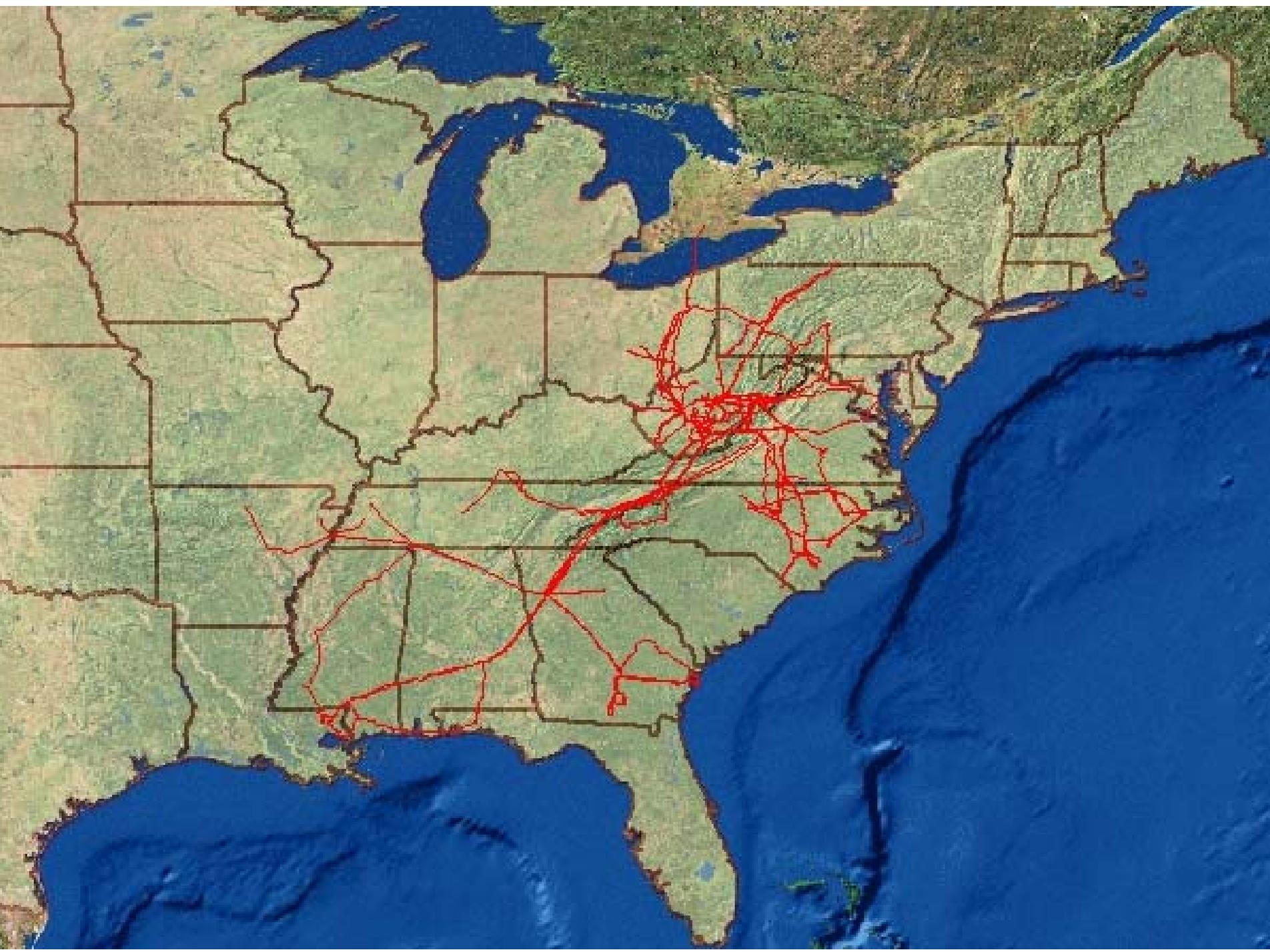


Cell phone SMS – sent to Eskom National Control Center and to appropriate field staff



ESKOM produces 95% of South Africa's electricity





A flashover - triggered by hot air plasma from intense fires that causes an electrical short circuit between the live conductor and the earth



Photo courtesy of R.Evert, Eskom



Next Steps

1. Enhance the FIRMS for protected areas
 - summary statistics (fire and burned area)
 - links to access moderate and high resolution imagery



Next Steps

2. Enhance Web Fire Mapper
 - incorporate the MODIS Fire Affected Area product
 - open source software
 - improved data handling techniques

3. Transition FIRMS to an operational domain at FAO and CI. Assist UNEP to integrate FIRMS in their current fire decision support system.

Acknowledgements

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Co-Investigators:

Chris Justice, Department of Geography, University of Maryland,
Jacques Descloitres, SSAI / NASA Goddard Space Flight Center
John Latham, United Nations Food and Agricultural Organization
John Musinsky, Conservation International
Collaborators: Ashbindu Singh (UNEP), Dan Irwin (NASA SERVIR)

FIRMS Team:

Shriram Ilavajhala and Minnie Wong from the Geography Department, UMD
Mike McGann UMIACS, UMD

<http://maps.geog.umd.edu/firms/>

