

Activities of UN-SPIDER RSO in Ukraine



Prof. Nataliia Kussul, Dr. Sergii Skakun,
Prof. Andrii Shelestov

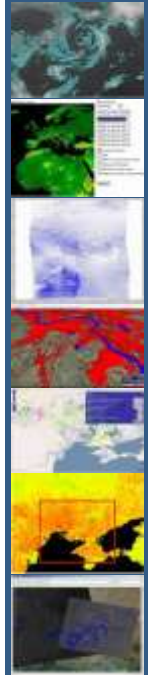
Space Research Institute NASU-NSAU,
Institute of Cybernetics NASU

4th UN International UN-SPIDER Bonn Workshop on
Disaster Management and Space Technology
12-14 October, 2010
Bonn, Germany

Outline



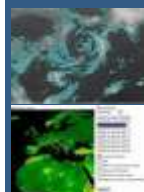
- Establishment of UN-SPIDER RSO in Ukraine
- RSO Workplan
- GEO-UA Conference – official opening ceremony of RSO
- Fire Monitoring in Ukraine 2010
- Flood Monitoring



UN-SPIDER RSO in Ukraine



- Signing of the Agreement during UN Committee on the Peaceful Uses of Outer Space (COPUOS) Session in Vienna



COOPERATION AGREEMENT
between the
UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS
and the
SPACE RESEARCH INSTITUTE OF
THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE
THE NATIONAL SPACE AGENCY OF UKRAINE
on the establishment of the
UN-SPIDER REGIONAL SUPPORT OFFICE IN UKRAINE

participation of the Regional Support Office staff in UN-SPIDER and other relevant activities, as well as to support the agreed UN-SPIDER-related activities to be carried out by the Regional Support Office;

2. The UN-SPIDER Programme Coordinator and the Coordinator of the Regional Support Office shall define in the beginning of every year, through an exchange of letters, an agreed upon workplan, to be carried out by the Regional Support Office and which should contribute to the UN-SPIDER workplan;
3. The Coordinator of the Regional Support Office shall prepare and submit annually a report on the activities carried out by the Regional Support Office during the previous year and which shall be incorporated into the report that the UN-SPIDER Programme Coordinator will prepare and submit annually to the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space;
4. The Regional Support Office may not use the name or logo of the United Nations, the United Nations Office for Outer Space Affairs, or the United Nations Platform for Space-based Information for Disaster Management and Emergency Response, without prior written consent from the United Nations.
5. The present Agreement shall be without prejudice to the privileges and immunities of the United Nations as set forth in the Convention on the Privileges and Immunities of the United Nations (1946).
6. The staff of the Regional Support Office shall not be considered in any respect as officials or staff of the United Nations. The United Nations does not accept any liability for claims arising out of the activities performed under the present Agreement, or any claims for death, bodily injury, disability, damage to property or other hazards that may be suffered by the personnel of the Regional Support Office as a result of their work pertaining to the UN-SPIDER-related activities. However, when the Regional Support Office expert is specifically invited by the UN-SPIDER Programme Coordinator to join a technical advisory mission to a Member State that requests such advisory support, he/she will be considered an "expert on mission" within the meaning of article VI of the Convention on the Privileges and Immunities of the United Nations (1946).
7. This Agreement shall enter into force upon signature by the Parties. It may be terminated by either Party by giving six months prior notice in writing.

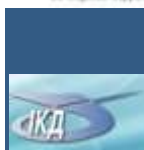
Signed on this ____th day of _____, 2010.

For the United Nations

Mazlan Othman
Director
Office for Outer Space Affairs
United Nations Office at Vienna

For the Space Research Institute of the
National Academy of Sciences of Ukraine
and the National Space Agency of Ukraine

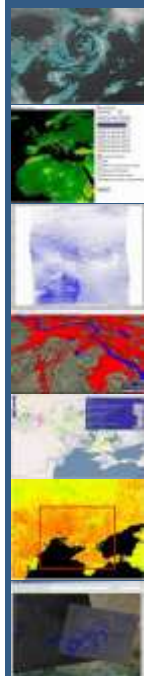
Oleg Fedorov
Director
Space Research Institute of the National
Academy of Sciences of Ukraine and the
National Space Agency of Ukraine



Meetings



- March 4, 2010
 - the first inter-branch meeting on establishment and maintenance of UN-SPIDER RSO in Ukraine
- April 6, 2010
 - working group meeting on activities of UN-SPIDER RSO in Ukraine
- June 14, 2010
 - Opening ceremony of the RSO
- Members
 - Ministry of Emergency Situations of Ukraine,
 - National Space Agency of Ukraine,
 - Ukrainian Hydrometeorological Center,
 - Institute of Cybernetics NASU,
 - Ukrainian Hydrometeorological Institute NASU,
 - National University of Life and Environmental Sciences of Ukraine
 - Institute for Information Recording



Web site of RSO UN-SPIDER



UN-SPIDER. Ukraine Regional Support Office - Mozilla Firefox

Файл Правка Видгляд Історія Закладки Інструменти Довідка

http://un-spider.ikd.kiev.ua/

BT-Chat.com Найбільш відвідувані Початкова сторінка Останні заголовки CGIAR-CSI SRTM 90m ... NASA - ASTER Imagery

UN-SPIDER. Ukraine Regional Suppo...



UN-SPIDER

Ukraine Regional Support Office



Main Events Activities Training User request form

About Ukrainian Regional Support Office



UN-SPIDER Regional Support Office (RSO) in Ukraine is established on the basis of the Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine.

The Institute signed the cooperation agreement with the United Nations Office of Outer space Affairs (UNOOSA) during the forty-seventh session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) on 10 February, 2010 in Vienna, Austria.

UN-SPIDER aims at providing **universal access** to all types of space-based information and services relevant to disaster management

UN-SPIDER RSO is a regional or national centre of expertise that is set up within an existing entity by a Member State or group of Member States that has put forward an offer to set up and fund the proposed regional support office.



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Services:



[Snow cover and flood monitoring in Ukraine 2010](#)

Collaboration:

[UN-SPIDER](#)

[CEOS WGISS](#)

[IT Department SRI NASU-NSAU](#)

Events:



[Conference on "Earth Observations for Sustainable Development and Security"](#)

UN-SPIDER RSO in Ukraine



- **Work Plan for 2010**

- **Outreach and Capacity Building**

- **1. Awareness Raising**

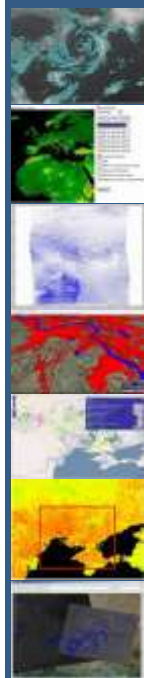
- RSO will receive digital files of UN-SPIDER awareness-raising material such as Newsletters, Leaflets and Bookmarks, print them, and distribute them at meetings and venues attended in the capacity of the RSO.

- **2. Outreach**

- RSO will consider hosting a conference in the summer and devoting a session in that conference to UN-SPIDER activities.
 - RSO will participate in the Regional Support Offices meeting in Vienna on 9-10 February 2010, parallel to the Scientific and Technical Subcommittee of COPUOS.
 - RSO will participate in other UN-SPIDER meetings as appropriate.

- **3. Capacity Building**

- RSO will host a capacity building session as a UN-SPIDER activity for the region. The curriculum will include applications of space-based information for disaster management and emergency response.
 - UN-SPIDER will consider providing curriculum guidance for the relevant modules of the session.
 - RSO will consider developing a relevant e-learning course, possibly with a Romanian institution.



UN-SPIDER RSO in Ukraine



- **Work Plan for 2010**

- **Horizontal Cooperation**

- **5. Cooperation and “Space Aid” Framework**

- RSO will provide value adding services to satellite data products, especially for flood impact analyses.
 - RSO will utilize its access to satellite data (such as Envisat archives) to support UN-SPIDER Space Aid activities, as appropriate.

- **6. Knowledge Management and Transfer**

- RSO will share relevant information from the region with UN-SPIDER, with an emphasis on Case Studies.

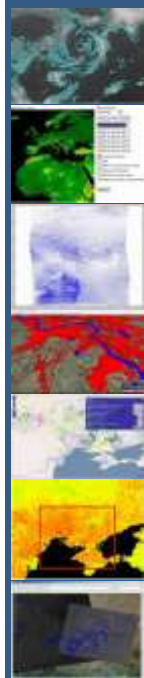
- **7. Knowledge Portal**

- None

- **Technical Advisory Support**

- **9. Support at the National Level**

- RSO will support and participate in technical advisory missions to countries within the region contributing to the definition of plans and policies with regard to the use of space-based technologies.



GEO-UA Conference



- The Second Conference “**Earth Observations for Sustainable Development and Security**” was held on June 14-17, 2010 in Kyiv, Ukraine
 - Int participation of:
 - UN-SPIDER – J. Szarzynski,
 - GEO Secretariat – R. Koopman,
 - EC Joint Research Center – J. Gallego,
 - ITC – T. Rientjes



GEO-UA Conference - cont



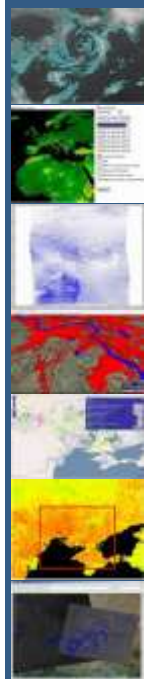
- **Special Workshops**

- **Official opening of UN-SPIDER Regional Support Office in Ukraine**

- The Office will help Ministries in Ukraine to better utilize space data for disaster management and to provide access to space-born information in the case of emergency situations.

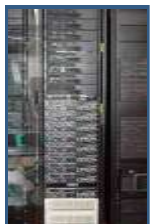
- **Food Security Workshop**

- Brought together specialists from Ukrainian and international institutions with practitioners from the
 - EC Joint Research Center,
 - Ukrainian Hydrometeorological center and
 - the Ministry of Agrarian Policy of Ukraine.





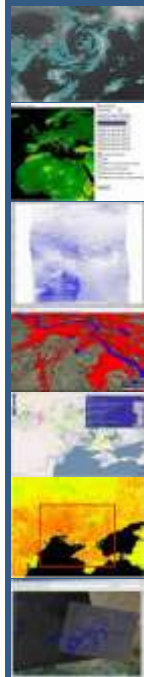
Fire Monitoring



Fires in Ukraine, 2010



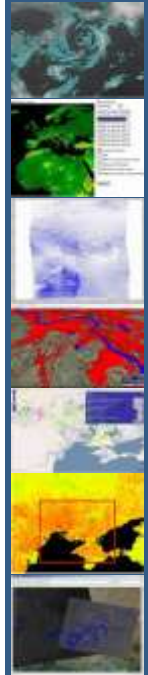
- Caused by extremely high temperature in July-August, 2010
 - **+35-39 C** in Eastern regions
 - **+40-42 C** in South regions
- High risk of:
 - Forest fires
 - Fires approaching ammunition depots
- Stats
 - From 5 to 20 August ~ 3000 fires were detected (**~200 per day**)
 - 2200 of them are forest fires with an area of 6500 ha being affected



Data and products



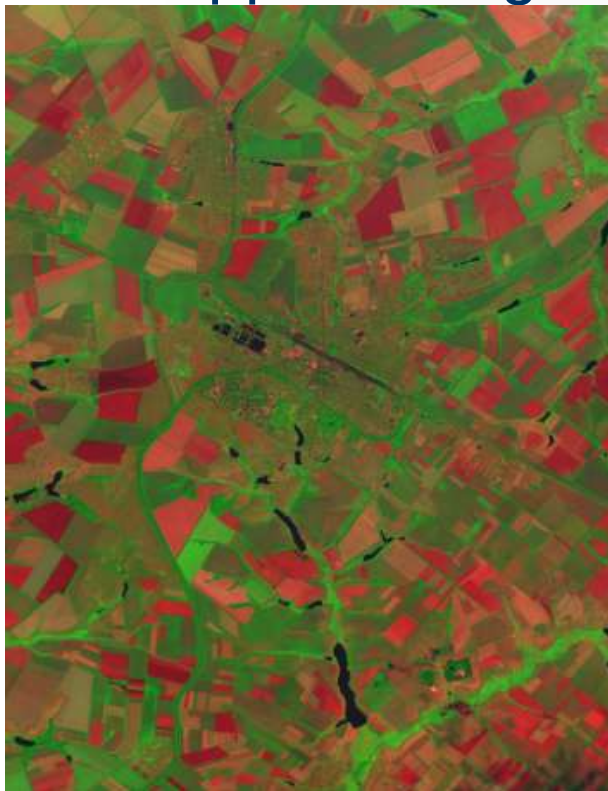
- EO-1/ALI
 - Acquisition through Sensor Web prototype
 - Date: 14.08.2010 08:15UTC
- Landat-5/TM
 - Date: 02.08.2010 08:15UTC
- ZKI Fire Service
 - Available on daily basis
 - Based on MODIS onboard Terra & Aqua
 - MOD14 algorithm
 - Available in KML, ESRI shapefile, WMS and WFS



Application



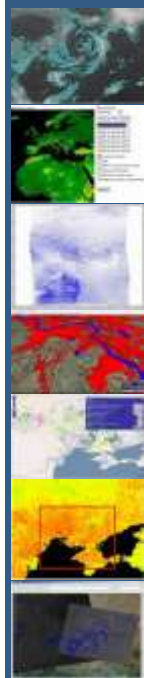
- EO-1/ALI
 - Monitoring location of military ammunition depots and approaching fire



10, 7, 5 - burnt areas



10, 9, 8 - active fires (appear in shades of red or yellow)



Application - cont

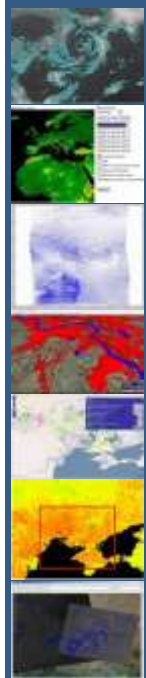


- Landsat-5/TM



Active
fires

02 August 2010

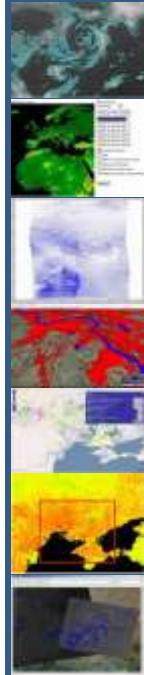
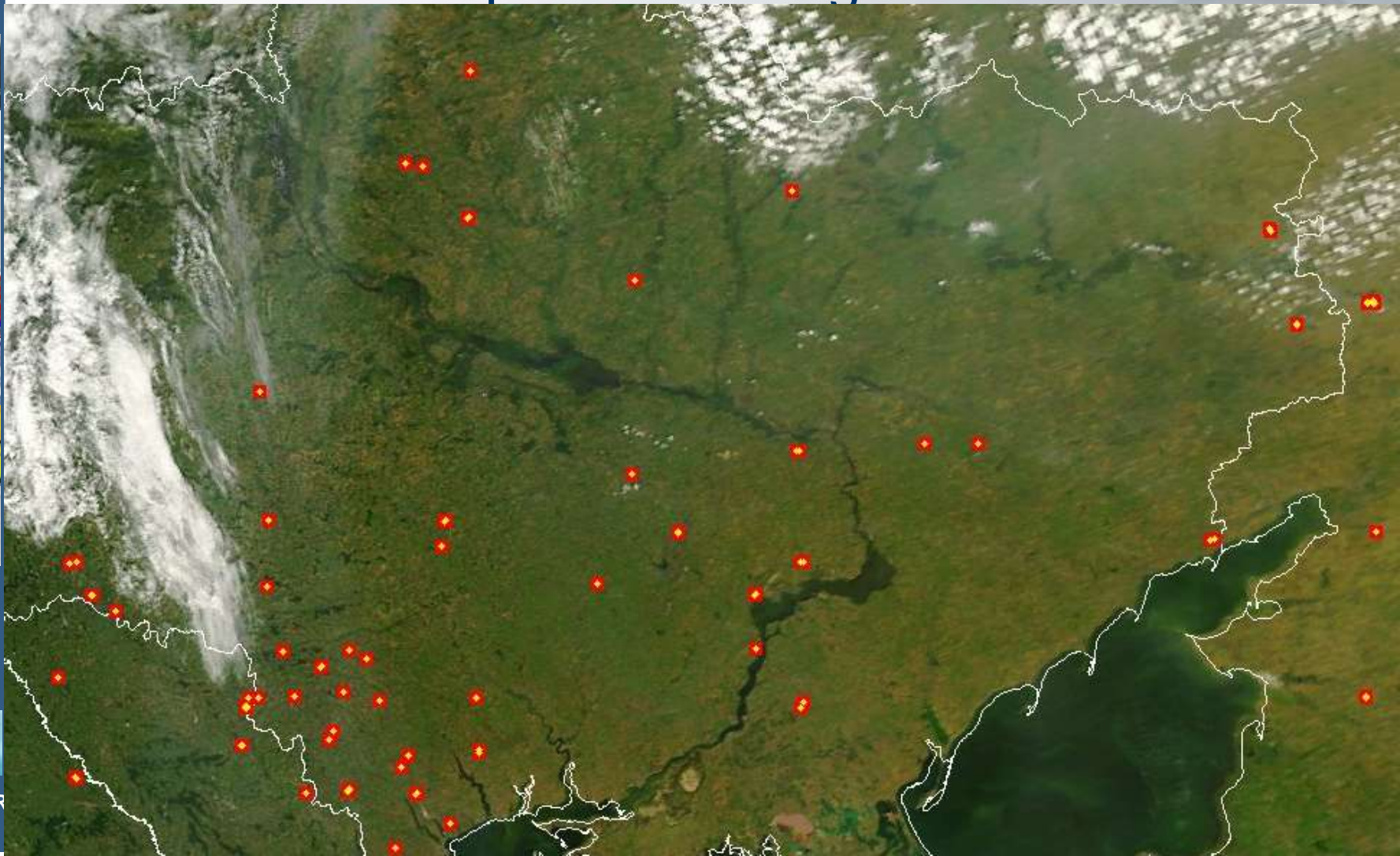


UN-SPIDER
2010

Application - cont



- MODIS – hot spots – 02 August 2010

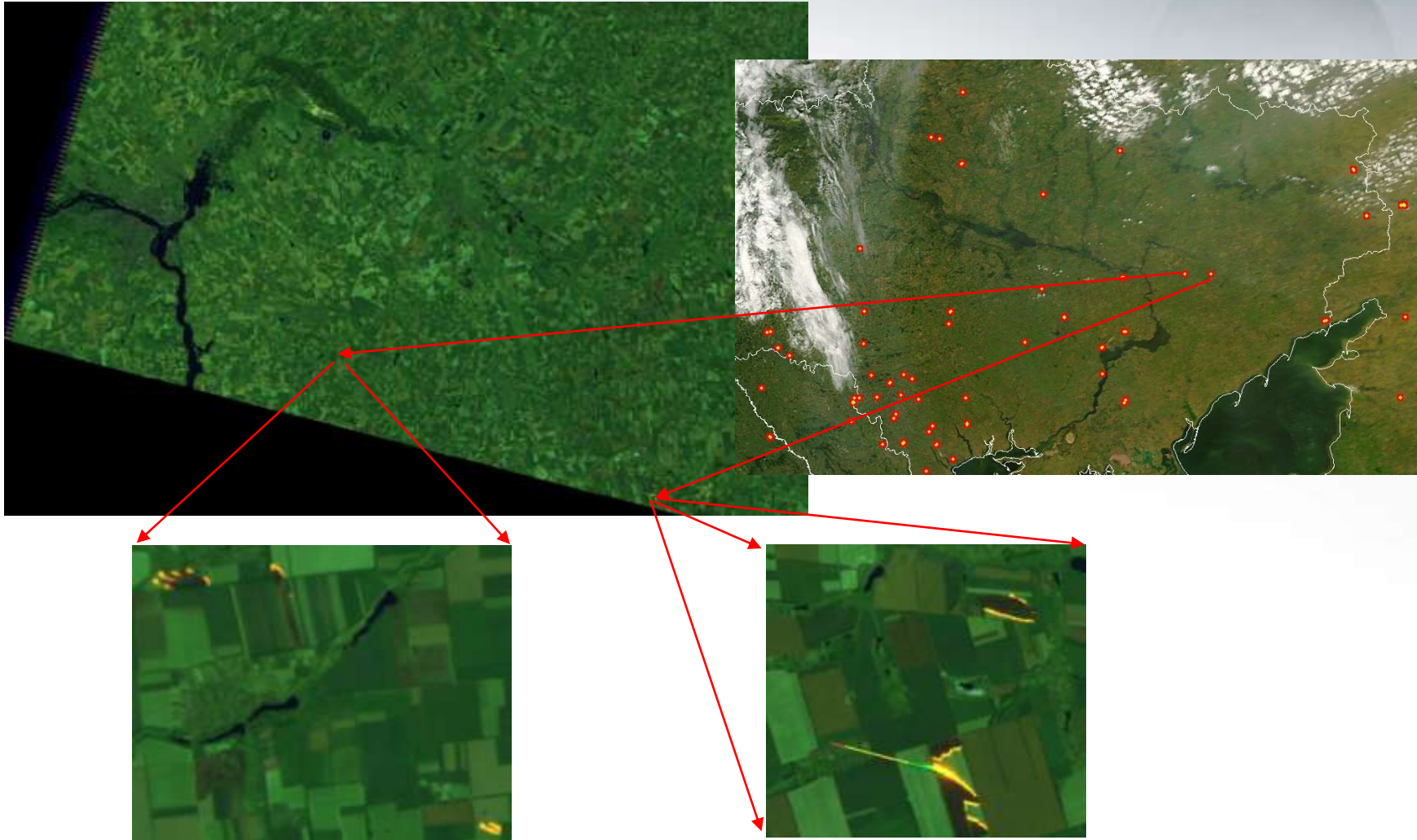


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2010

Cross-validation



- Landsat-5 vs MODIS



Delivery to users



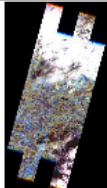

- To Ministry of Emergency Situations and National Space Agency of Ukraine

Operational satellite monitoring of fires in Ukraine

Satellite data: MODIS (Terra, Aqua), EO-1, Landsat-5.

Products for fires based on MODIS data generated by German Remote Sensing Data Center (DFD) of the German Aerospace Center (DLR).

Data EO-1

Date	Data
14.08.2010 08:15UTC	EO-1/ALI: jpg (combination of channel 1098)  jpg (панхром) 

Data Landsat-5

Date	Data
02.08.2010 08:15UTC	Landsat-5: jpg (combination of channel 321)  jpg (combination of channel 432)  jpg (combination of channel 753) 

Data MODIS

Date	Data
14.08.2010 11:00UTC	MODIS: KML , jpg (combination of channel 143) 

New! [Monitoring of fires in Ukraine 2010](#)

[22.02.2010]
[Snow cover and flood monitoring in Ukraine 2010.](#)

[29.05.2010]
Under the scientific and technological project of NASU - "A distributed system of crop monitoring" - the kick-off meeting between the scientists of SRI NASU-NSAU and the representatives of agricultural production co-operative "Mayak" has been held [Read more...](#)

[17.05.2010]-[21.05.2010]
Prof. N. Kussul, Prof. Shelestov, Dr. Skakun. and Andrii Mironov participated in WGISS-29 meeting which was held in Bonn, Germany. [Read more...](#)

[29-31.03.2010]
Prof. N. Kussul, Dr. Skakun and Dr. Kravchenko participated in the kick-off meeting devoted to the implementation of JRC EC contract "Estimation of crop areas based on the satellite data in Ukraine." [Read more...](#)

The Conference on "Earth Observations for Sustainable Development and Security"
The Second Conference on "Earth Observations for Sustainable Development and Security" will be held in Kyiv, Ukraine from 14 to 17 June 2010.



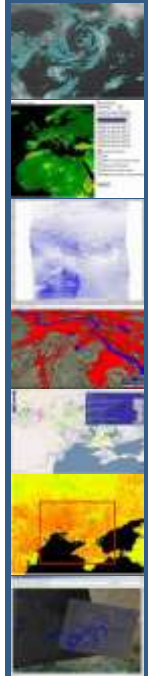
Floods Monitoring



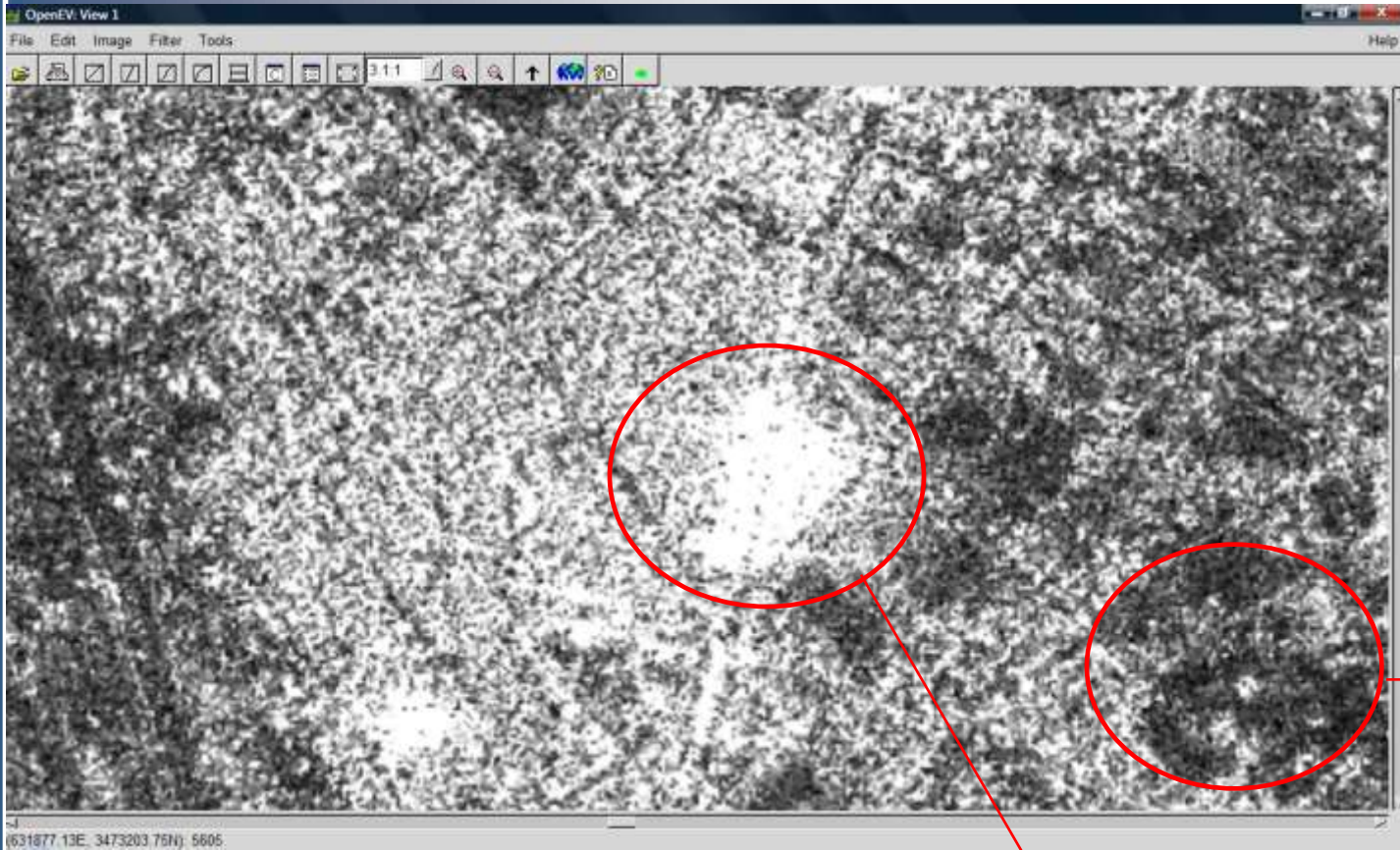
Gaza, 2010



- UNOOSA has activated the International Charter: Space and Major Disasters on 21 January 2010 on behalf of UNOCHA for recent floods in Gaza, which affected 500 people
- Flash flood
 - **occurred on Monday evening (18 Jan 2010)** because "Israel opened one of its dams that were overfilled with heavy rain water" (<http://www.imemc.org>)
 - **characteristic time** for flash floods is **hours** (for ordinary floods are days-weeks)
 - flash flood meaning the **water was running very fast** through the region which has **a lot of sands that absorbs water very fast**
- Satellite data
 - ALOS/PALSAR
 - < Pre-disaster data > : November 5, 2008 (2 scenes)
 - < Post-disaster data > : January 22, 2010
 - RADARSAT-1
 - < Pre-disaster data > : December, 12, 2007
 - RADARSAT-1
 - < Post-disaster data > : January 23, 2010



Gaza, 2010 (cont')



Sand "looks" similar to open water!

How the city looks in SAR image



Ukraine, 2010



- High risk of flood due to snow melting

UN-SPIDER. Ukraine Regional Support Office - Mozilla Firefox

Файл Правка Вигляд Історія Закладки Інструменти Довідка

http://un-spider.ikd.kiev.ua/floods-ukraine-2010/

BT-Chat.com Найбільш відвідувані Початкова сторінка Останні заголовки CGIAR-CSI SRTM 90m ... NASA - ASTER Imagery

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Operational snow and flood satellite monitoring for Ukraine

EO-1 (optical)

Satellite images: Data courtesy of the NASA Earth Observing One (EO-1) mission operated by the Goddard Space Flight Center, 2010


Image processing: Space Research Institute of NASU-NSAU

Date	Access to map (KML format)	Quick look
13.04.2010 (08:32 UTC)	KML: link KML (apxib): link	 link
23.03.2010 (08:18 UTC)	KML: link KML (archive): link KML (as Network Link): link	 link
10.03.2010 (08:14 UTC)	KML: link KML (archive): link KML (as Network Link): link	 link

Envisat/ASAR (synthetic-aperture radar)

Satellite images: Copyright ESA 2009, 2010


Services:

 [Snow cover and flood monitoring in Ukraine 2010](#)

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[CEOS WGIS](#)
[IT Department SRI NASU-NSAU](#)

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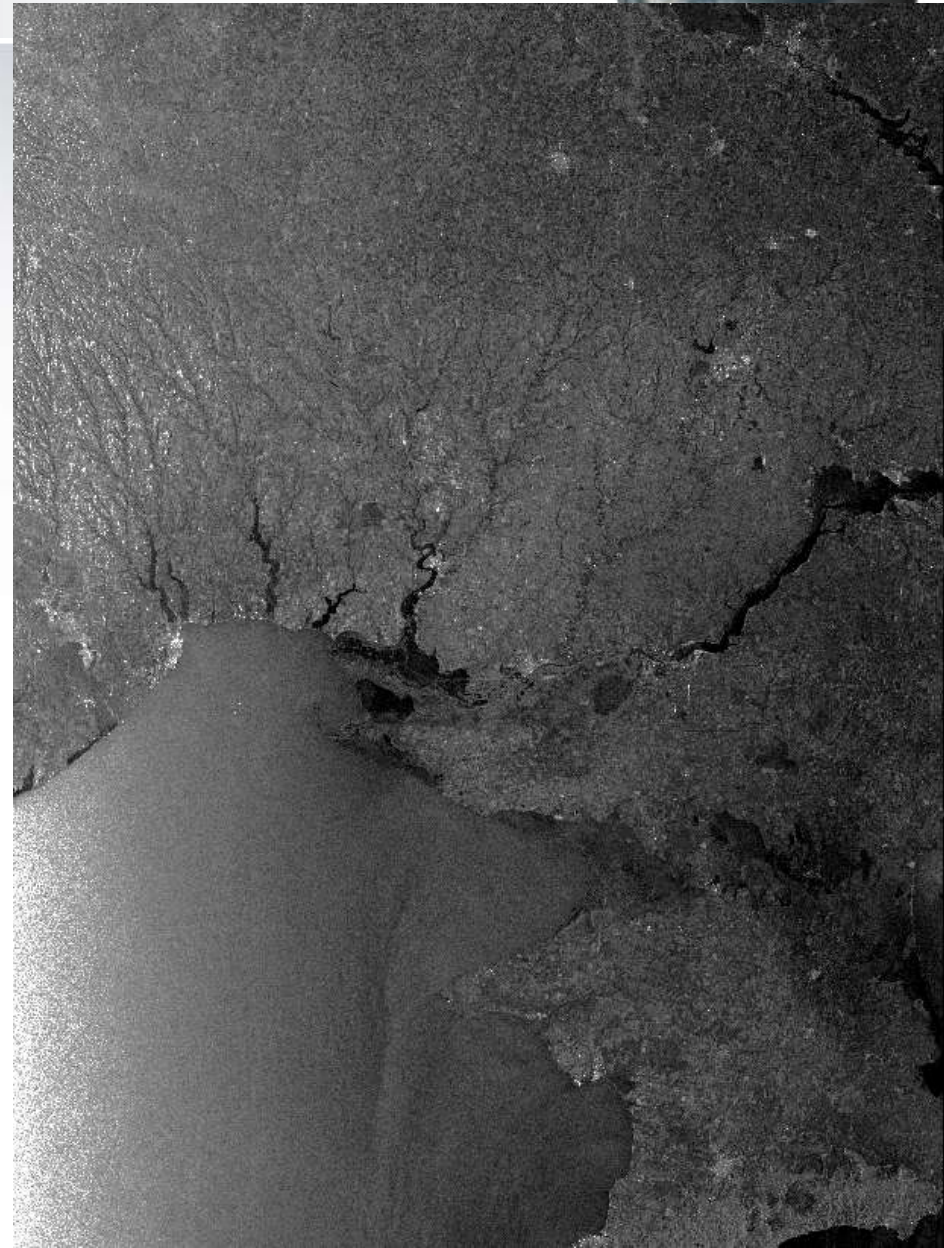
Зроблено

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Satellite Data for Ukraine



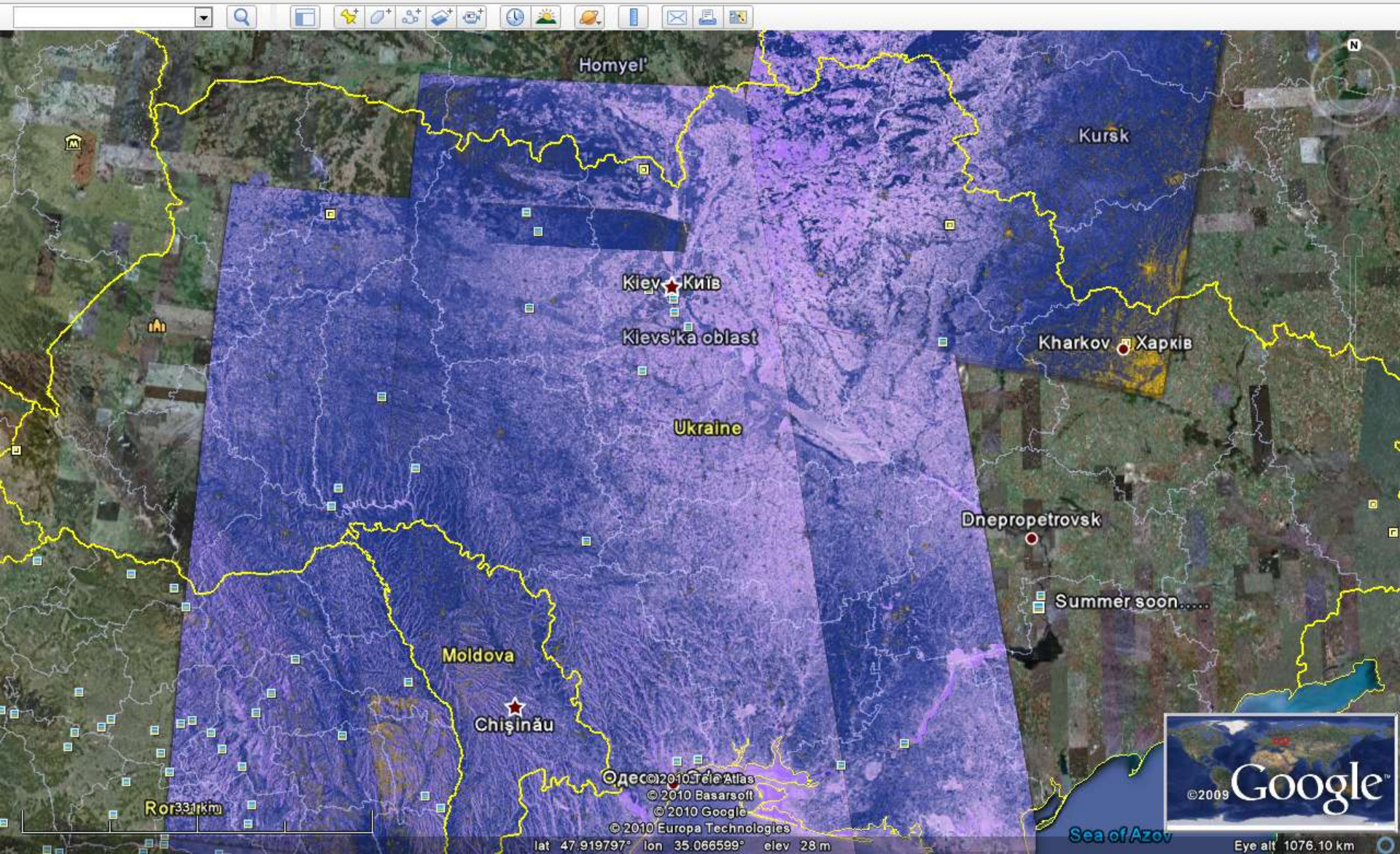
- Flood Risk Assessment on the base of UN-SPIDER RSO
- Envisat/ASAR imagery
 - **>25 images** within **1 January through 16 April 2010**
 - **>50 images** for autumn **2009** (for comparison)
- NASA EO-1/ALI
 - 3 images: 10, 23 March and 13 April 2010



Snow cover from ASAR



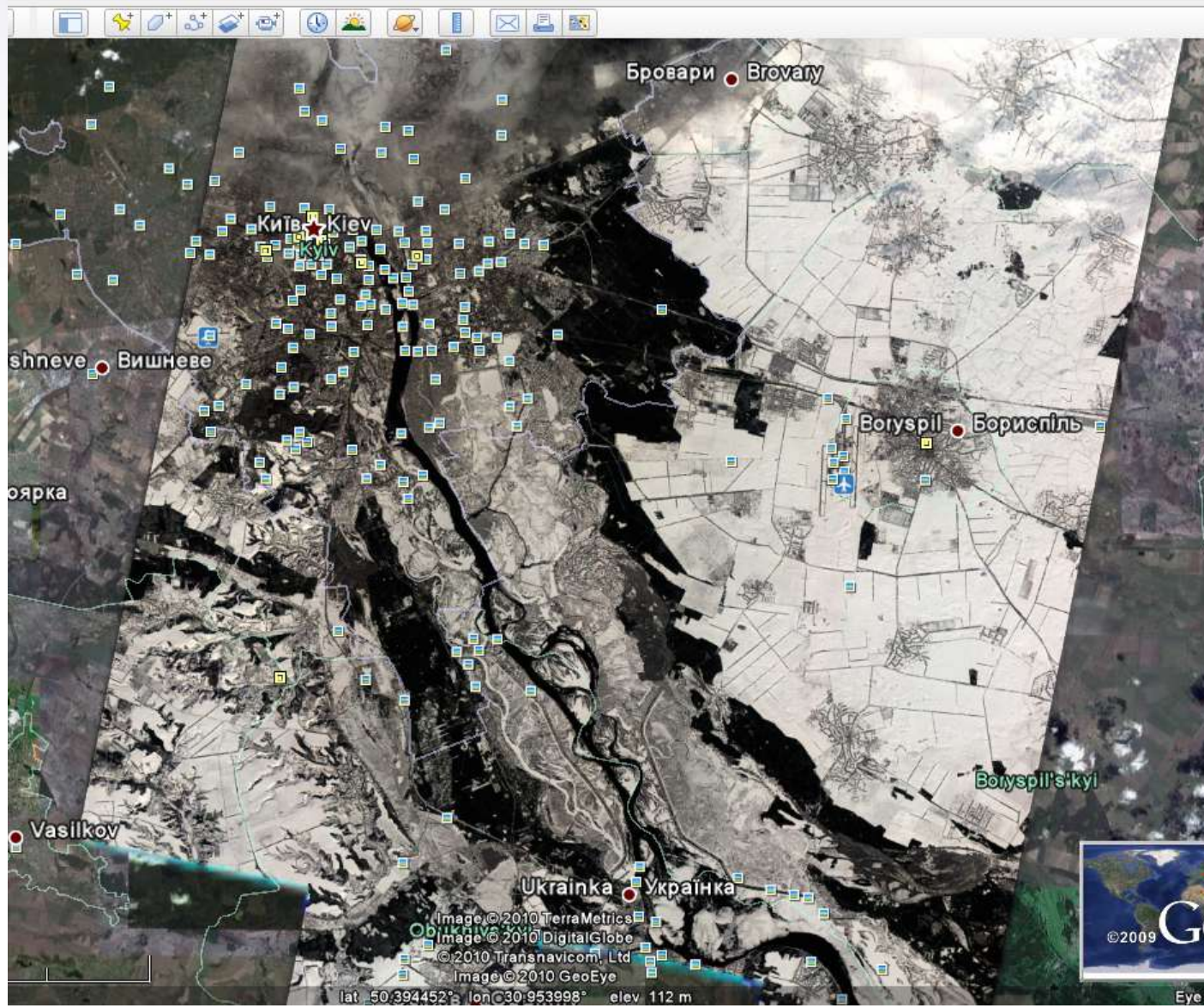
File Edit View Tools Add Help



EO-1 / Advanced Land Imaging



10 March 2010

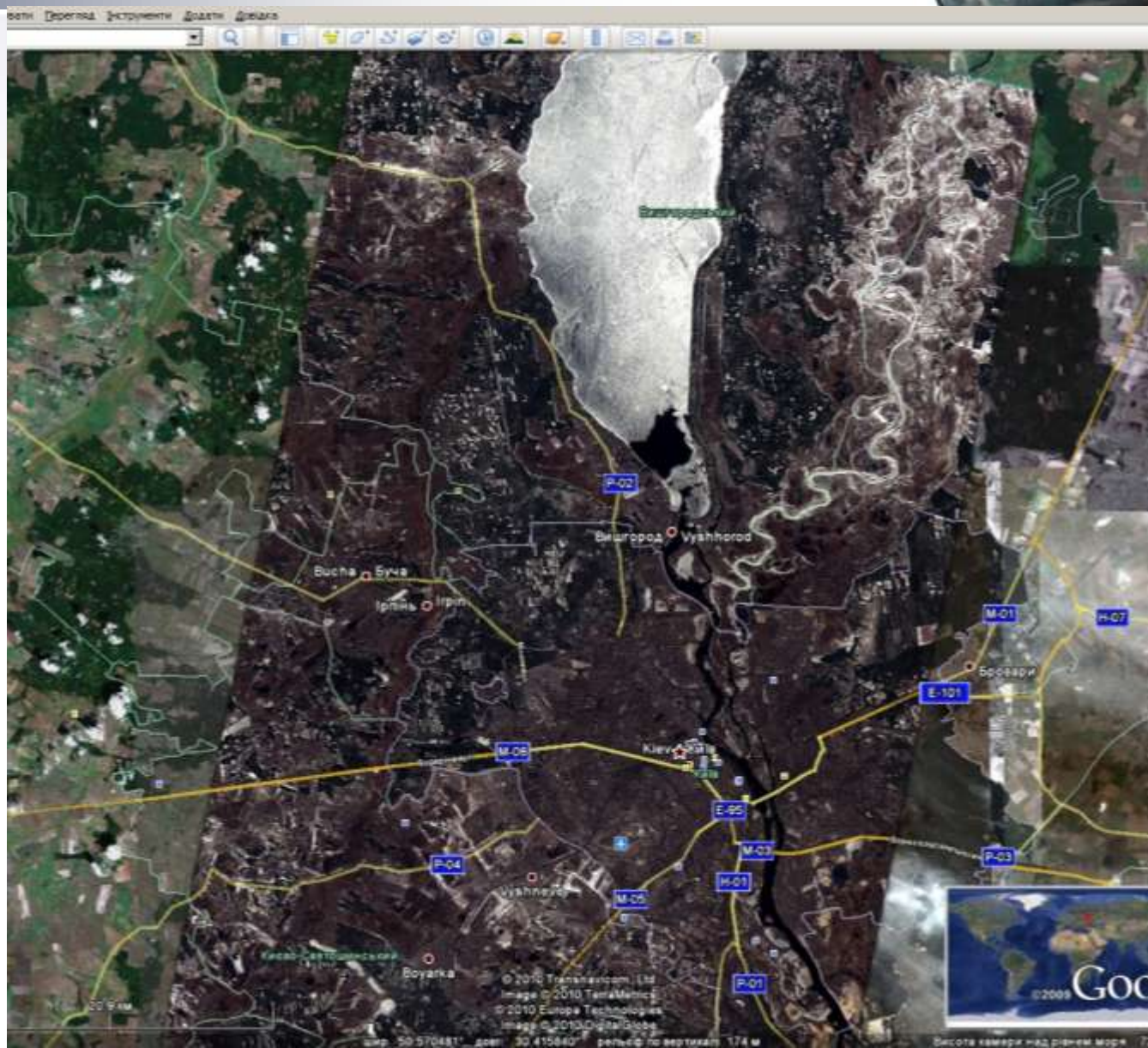


Data courtesy of the
NASA Earth Observing
One (EO-1)
mission operated by
the Goddard Space Flight
Centre

EO-1 / Advanced Land Imaging



23 March 2010

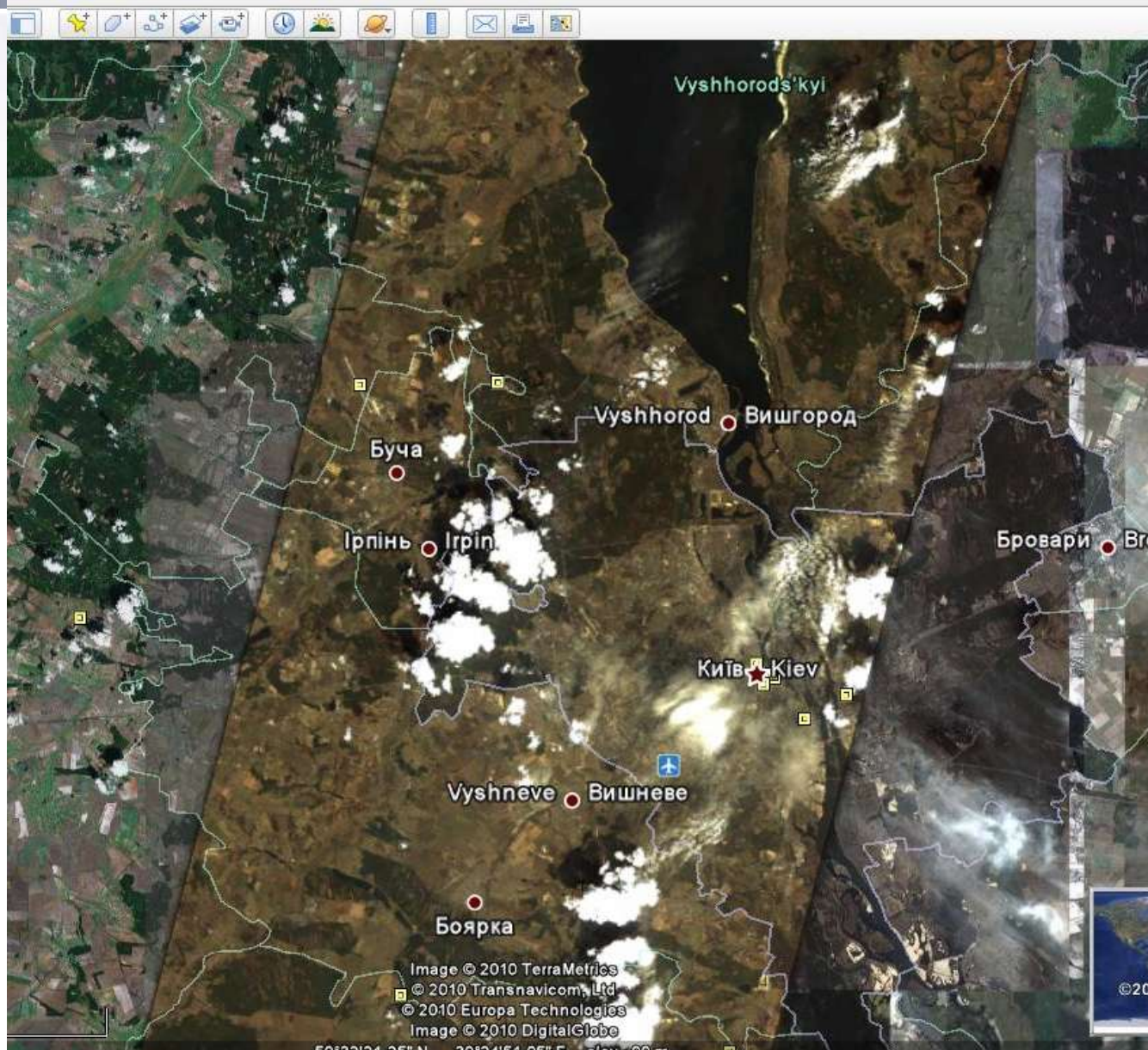


Data courtesy of the
NASA Earth Observing
One (EO-1)
mission operated by
the Goddard Space Flight
Centre

EO-1 / Advanced Land Imaging

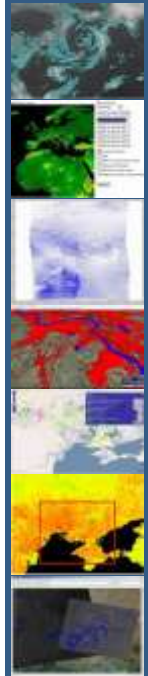
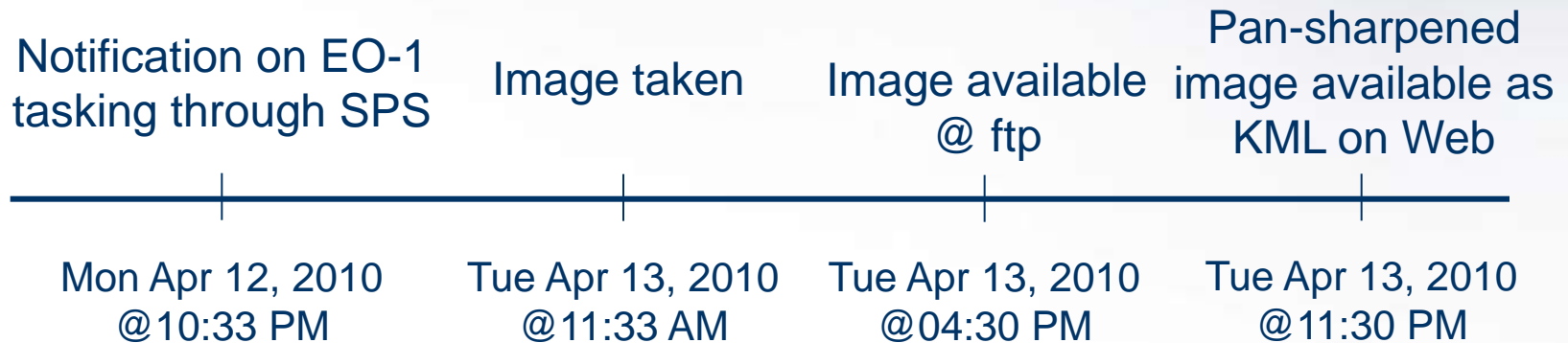


13 April 2010



Data courtesy of the
NASA Earth Observing
One (EO-1)
mission operated by
the Goddard Space Flight
Centre

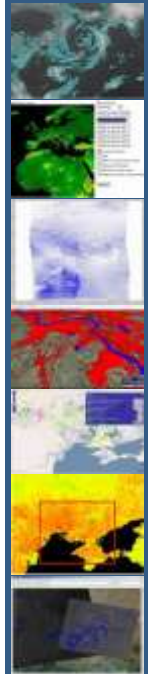
EO-1 / Advanced Land Imaging - Timeline



Integration and analysis of ground and satellite data



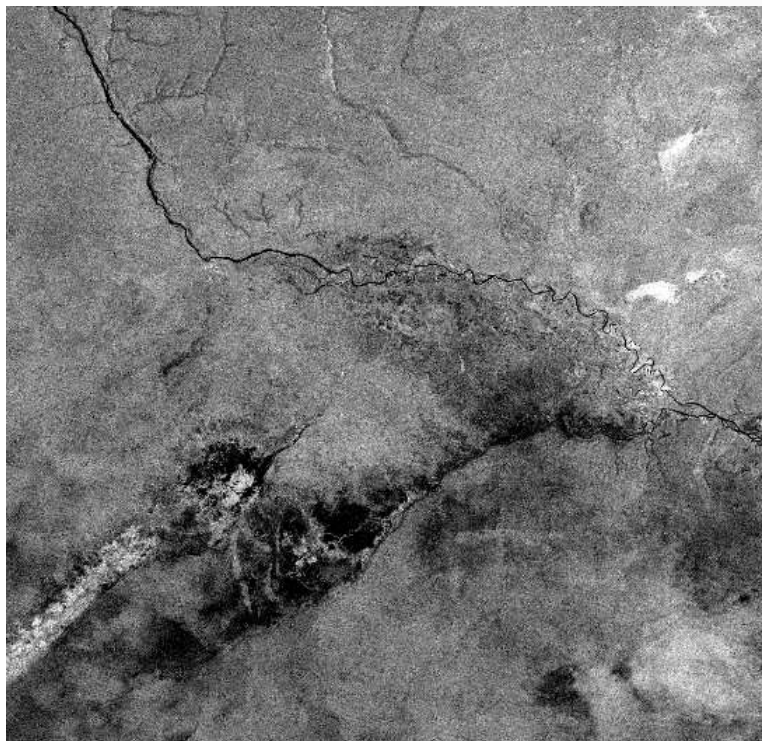
- UN Technical Advisory Meeting in Namibia
- Location: Namibia
- Ground data
 - 25-27 January 2010
 - Collected with GPS and camera using
 - Car
 - Boat
 - Air



Integration and analysis of ground and satellite data - cont



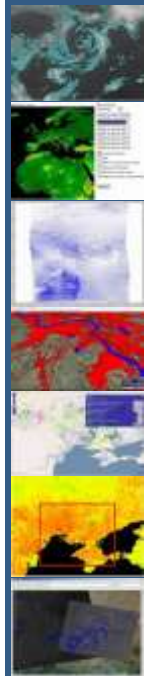
- Satellite data
 - Envisat/ASAR, 30 January 2010
 - Landsat-5/TM, 26 January 2010



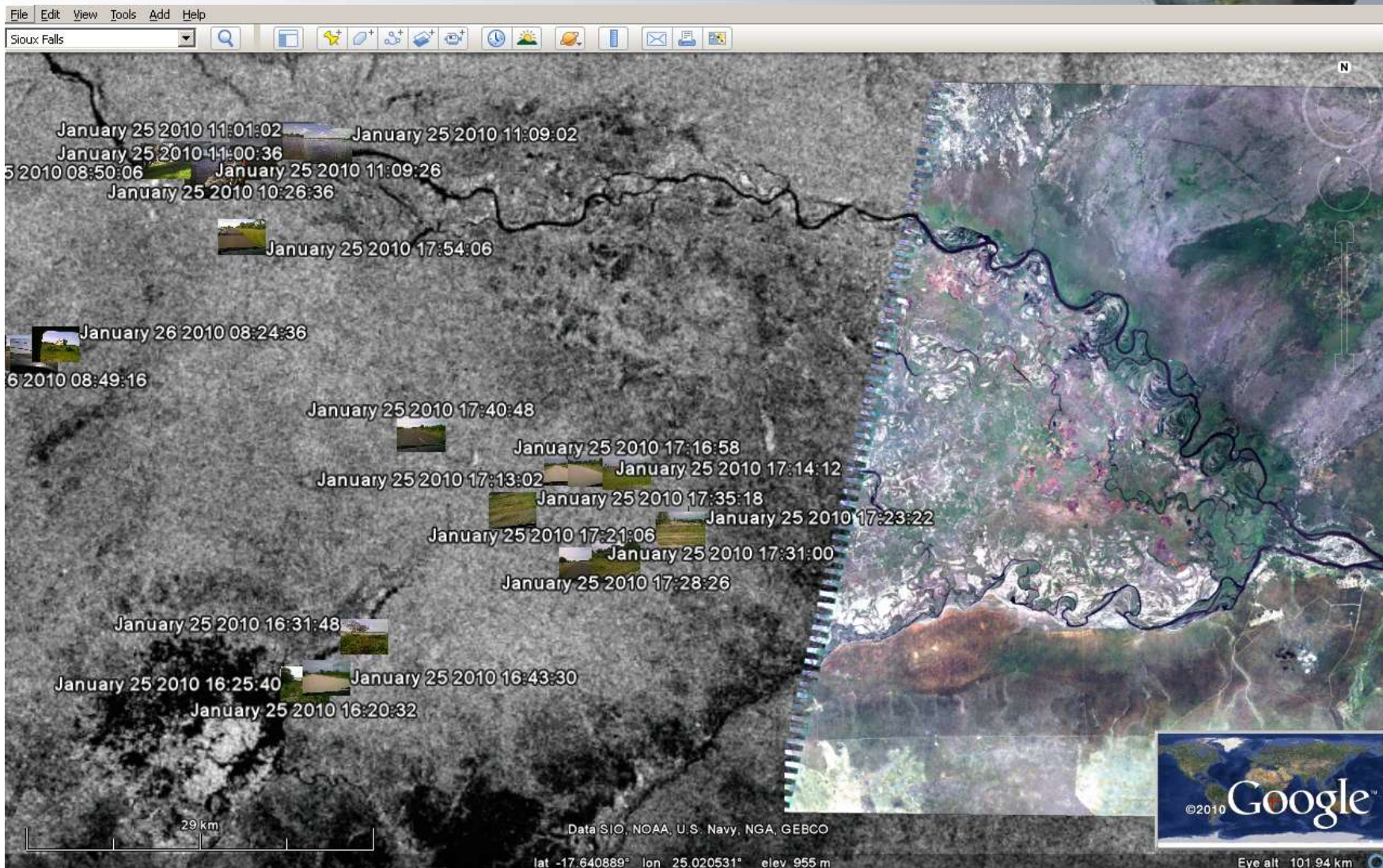
Envisat/ASAR



Landsat-5/TM



Integration in Google Earth



Integration in Google Earth



File Edit View Tools Add Help

Sioux Falls

January 25 2010 16:20:32

January 25 2010 16:25:40

January 25 2010 16:

Directions: [To here](#) - [From here](#)

3.80 km

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

lat -17.885458° lon 24.394092° elev 944 m

©2010 Google™

Eye alt 13.85 km

Integration in Google Earth



File Edit View Tools Add Help

Sioux Falls


January 25 2010 09:17:24 January 25 2010 09:30:52 January 25 2010 10:14:56 January 25 2010 10:34:32

January 25 2010 09:10:14 January 25 2010 09:10:48 January 25 2010 10:33:00 January 25 2010 10:33:30

January 25 2010 10:22:18 January 25 2010 10:26:36 January 25 2010 10:24:12

January 25 2010 17:58:06

January 25 2010 09:30:52



Directions: [To here](#) - [From here](#)

2882 m

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

lat -17.487331° lon 24.289976° elev 995 m

©2010 Google

Eye alt 10.83 km

Integration in Google Earth



File Edit View Tools Add Help

Sioux Falls

January 25 2010 10:54:26

January 25 2010 10:54:56

January 25 2010 11:01:02

January 25 2010 11:09:02

January 25 2010 10:43:22

January 25 2010 10:34:32

January 25 2010 10:22:18

January 25 2010 10:33:30

January 25 2010 10:26:36

January 25 2010 10:24:12

January 25 2010 17:58:06

January 25 2010 10:54:26

Directions: [To here](#) - [From here](#)

3276 m

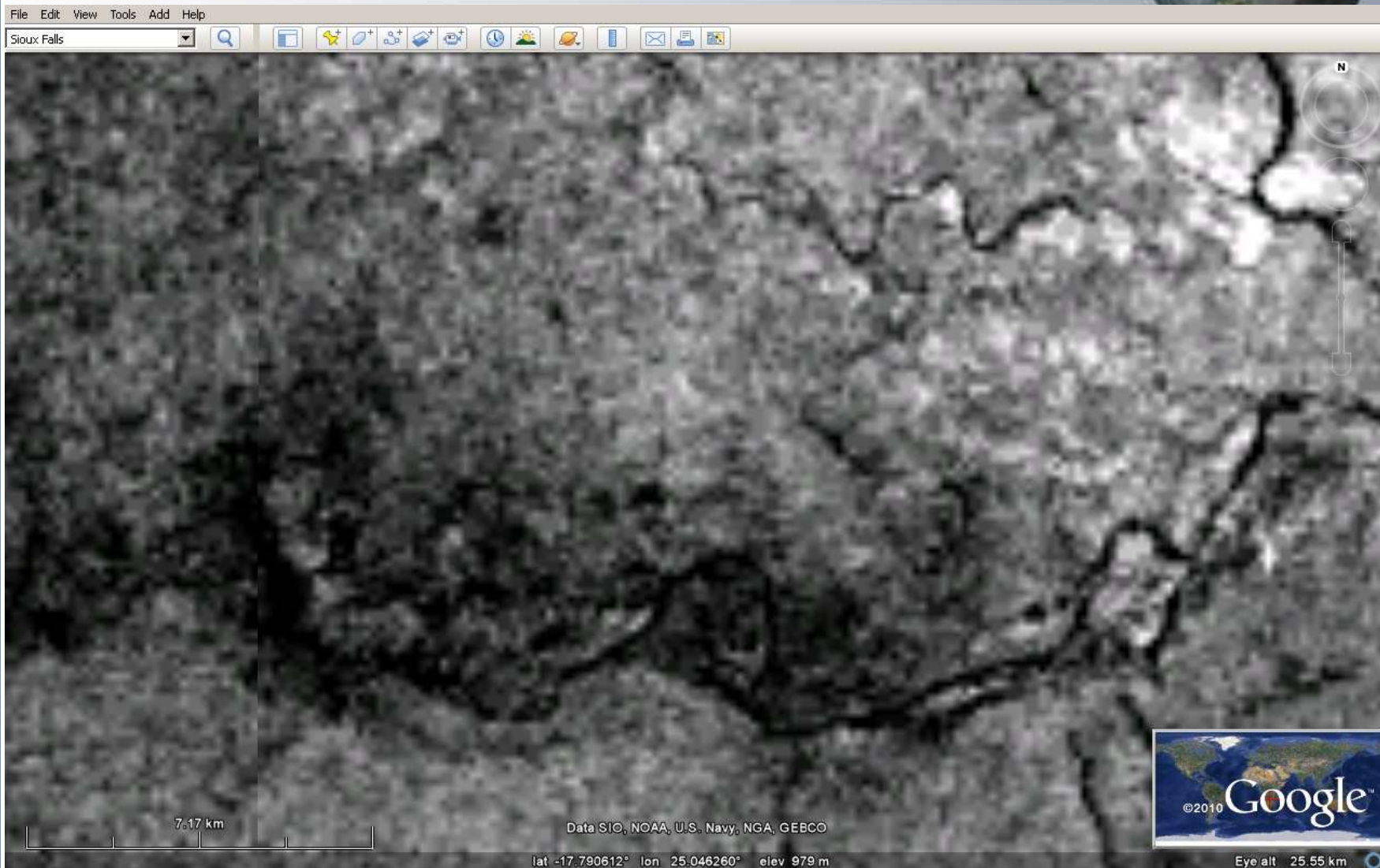
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

lat -17.475426° lon 24.387879° elev 985 m

©2010 Google

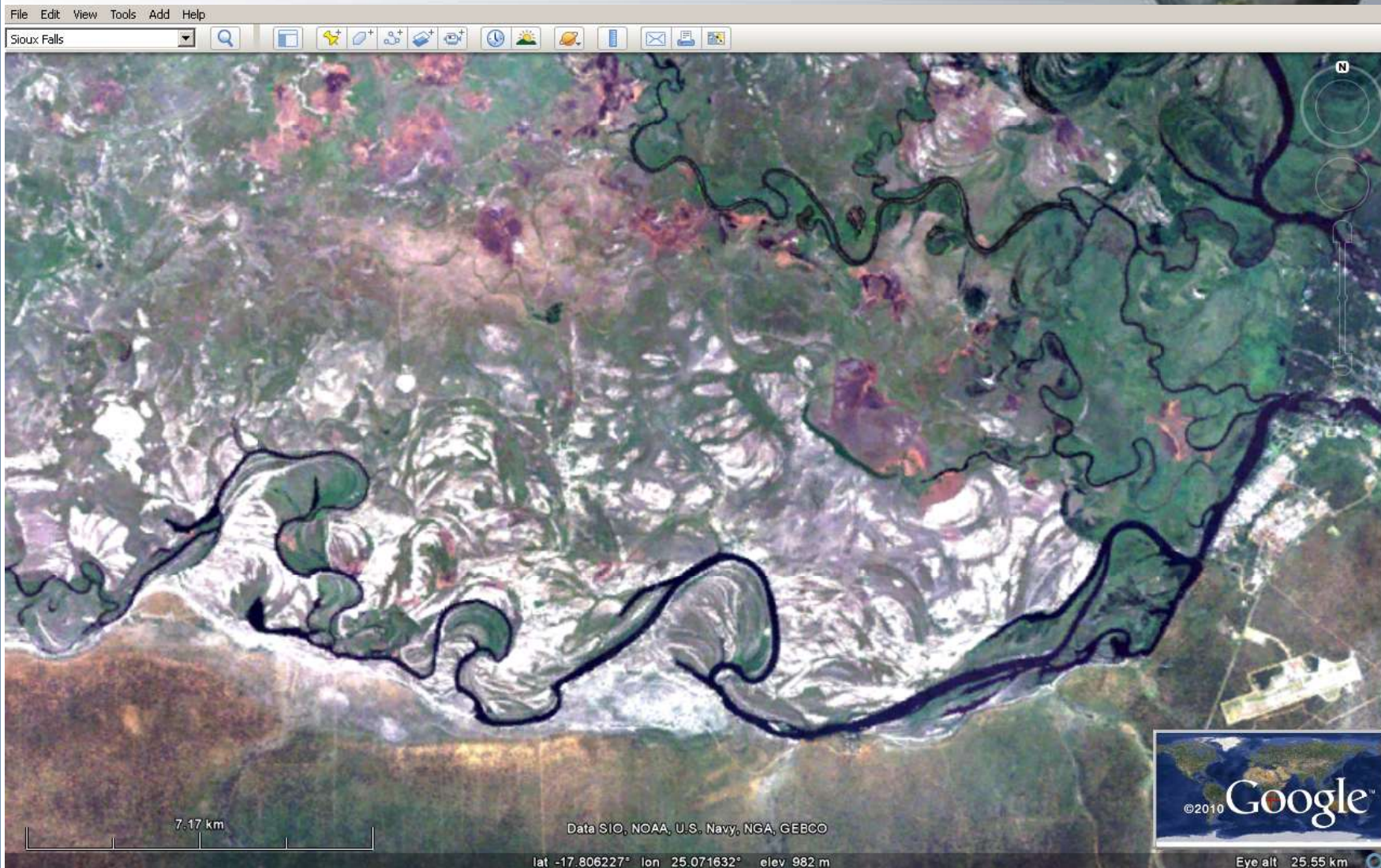
Eye alt 12.18 km

Integration in Google Earth



Envisat/ASAR 30-Jan-2010

Integration in Google Earth



Landsat-5/TM 26-Jan-2010



Thank You!

