

UN-SPIDER Regional Support Office in Ukraine: Fire Monitoring using Satellite Data

Prof. N. Kussul, Dr. S. Skakun

Space Research Institute NASU-NSAU
UN-SPIDER Regional Support Office in Ukraine

REEFMC
4 March, 2013
Kyiv, Ukraine



UN-SPIDER RSO in Ukraine



- Signing of the Agreement during UN Committee on the Peaceful Uses of Outer Space (COPUOS) Session in 2010 in Vienna, Austria
- **UN-SPIDER Mission**
 - *to provide universal access to all types of space-based information and services relevant to disaster management*



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

NOTING the generous offer made by the Government of Ukraine to establish and host a UN-SPIDER Regional Support Office,

RECALLING that the General Assembly Resolution 61/110, paragraph 11, states that the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) Programme, being implemented by the United Nations Office for Outer Space Affairs, should "work closely with regional and national centres of expertise in the use of space technology in disaster management to form a network of regional support offices for implementing the activities of the programme in their respective regions in a coordinated manner and to take advantage of the important expertise and capabilities being offered, and to be offered, by Member States, particularly by developing countries";

FURTHER NOTING the guidelines for selecting and setting up the proposed UN-SPIDER Regional Support Offices as stated in A/63/20, paragraph 129, and the General Assembly's agreement with those guidelines, as expressed in A/RES/63/90, paragraph 40,

DESIRING to establish a common ground for cooperation between the United Nations Office for Outer Space Affairs and the Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine with regards to the operation of the UN-SPIDER Regional Support Office in Ukraine (hereinafter referred to as "Regional Support Office");

The UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS and the SPACE RESEARCH INSTITUTE OF THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE and the NATIONAL SPACE AGENCY OF UKRAINE,

HAVE AGREED as follows:


1. The Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine shall be responsible for providing office space, infrastructure (computer equipment, office furniture, communication facilities and maintenance and operational support) and at least one expert, to be the Coordinator of the Regional Support Office, as well as additional funding as needed to ensure the

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 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.

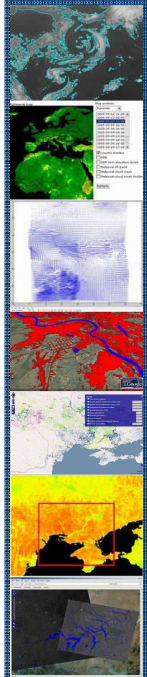
Signed on this _____th day of _____ 2010.

For the United Nations


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

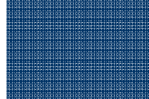
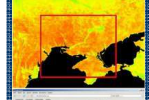
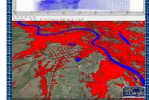
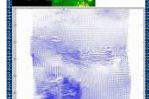
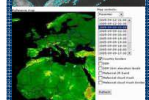
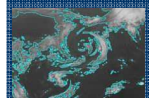
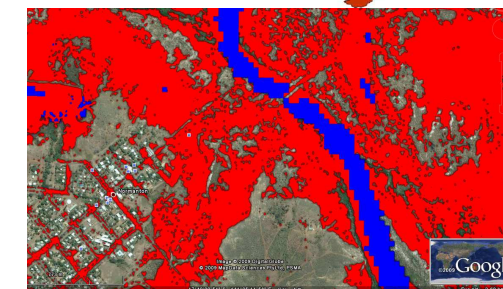
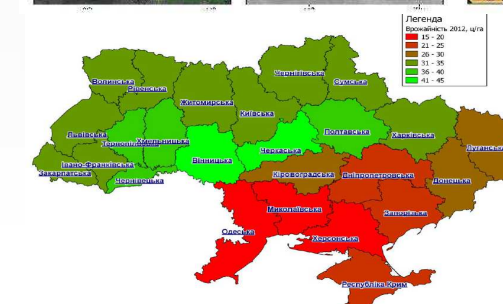
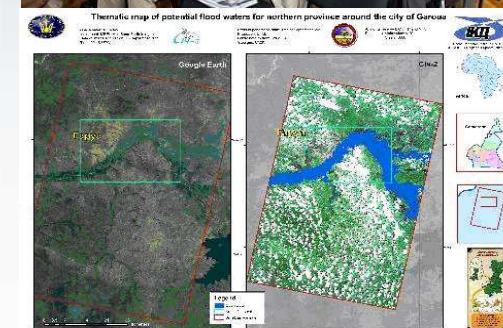
For the Space Research Institute of the National Academy of Sciences of Ukraine and the National Space Agency of Ukraine

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



Scope of activities

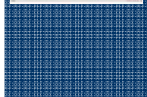
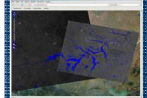
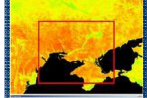
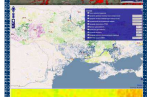
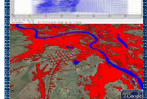
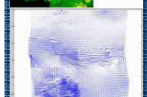
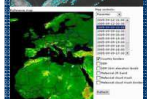
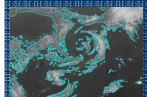
- **Outreach and Capacity Building**
 - Trainings activities and conferences
 - Contribution to UN-SPIDER newsletters, scientific publications
 - Participation in UN-SPIDER-related events
- **Technical Advisory Support**
 - Participation in the Namibian SensorWeb project
 - On demand flood risk mapping and flood risk assessment
- **Horizontal Cooperation**
 - Operational flood mapping based on satellite data on request from **UN-SPIDER** and **International Charter “Space and Major Disasters”**
 - Rapid mapping (floods, clear-cuts, fires) on request from local authorities



Fires in Ukraine, 2010



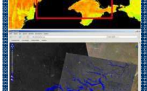
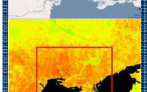
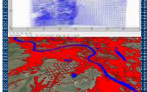
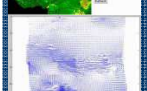
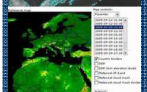
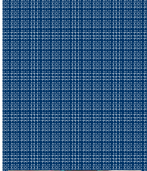
- Caused by extremely high temperature in July-August, 2010
 - **+35-39 C** in Eastern regions
 - **+40-42 C** in South regions
- High risk of:
 - Forest and agriculture fields fires
 - Fires approaching ammunition depots
- Statistics
 - From 5 to 20 August ~ 3000 fires were detected (**~200 per day**)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



Data and products



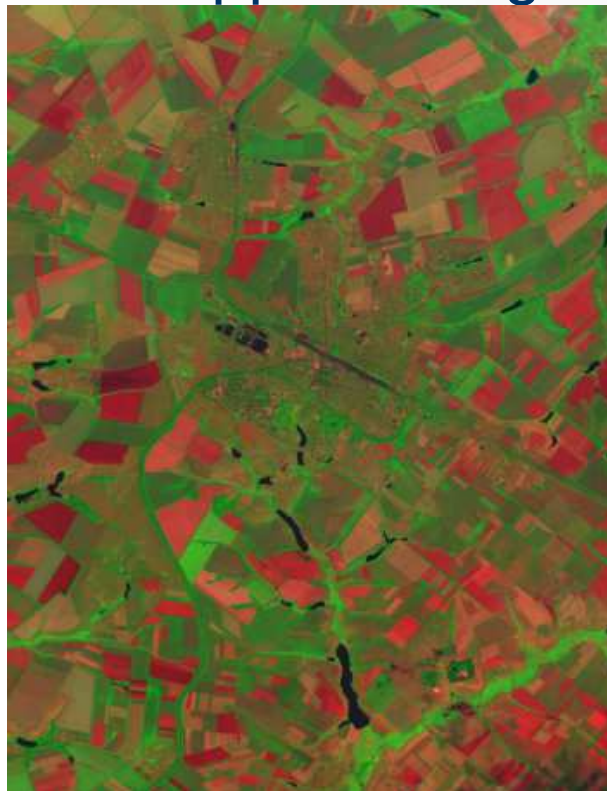
- ZKI Fire Service
 - Available on daily basis
 - Based on MODIS onboard Terra & Aqua
 - MOD14 algorithm
 - Available in KML, ESRI shapefile, WMS and WFS
- EO-1/ALI
 - Acquisition through Sensor Web prototype
 - Date: 14.08.2010 08:15UTC
- Landat-5/TM
 - Date: 02.08.2010 08:15UTC



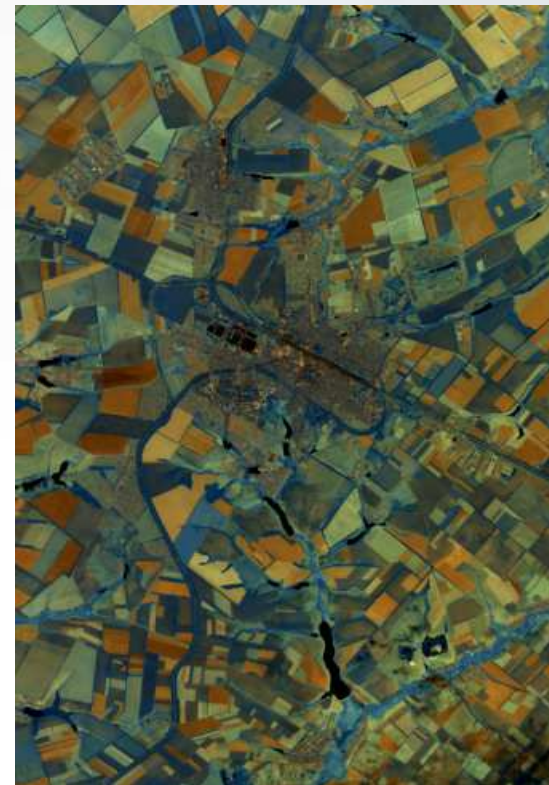
Application



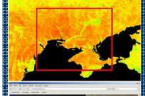
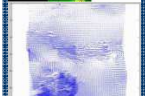
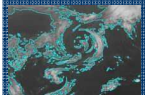
- EO-1/ALI
 - Monitoring location of military ammunition depots and approaching fire



10, 7, 5 - burnt areas



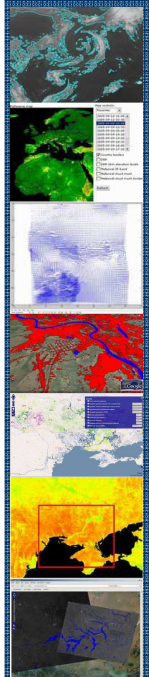
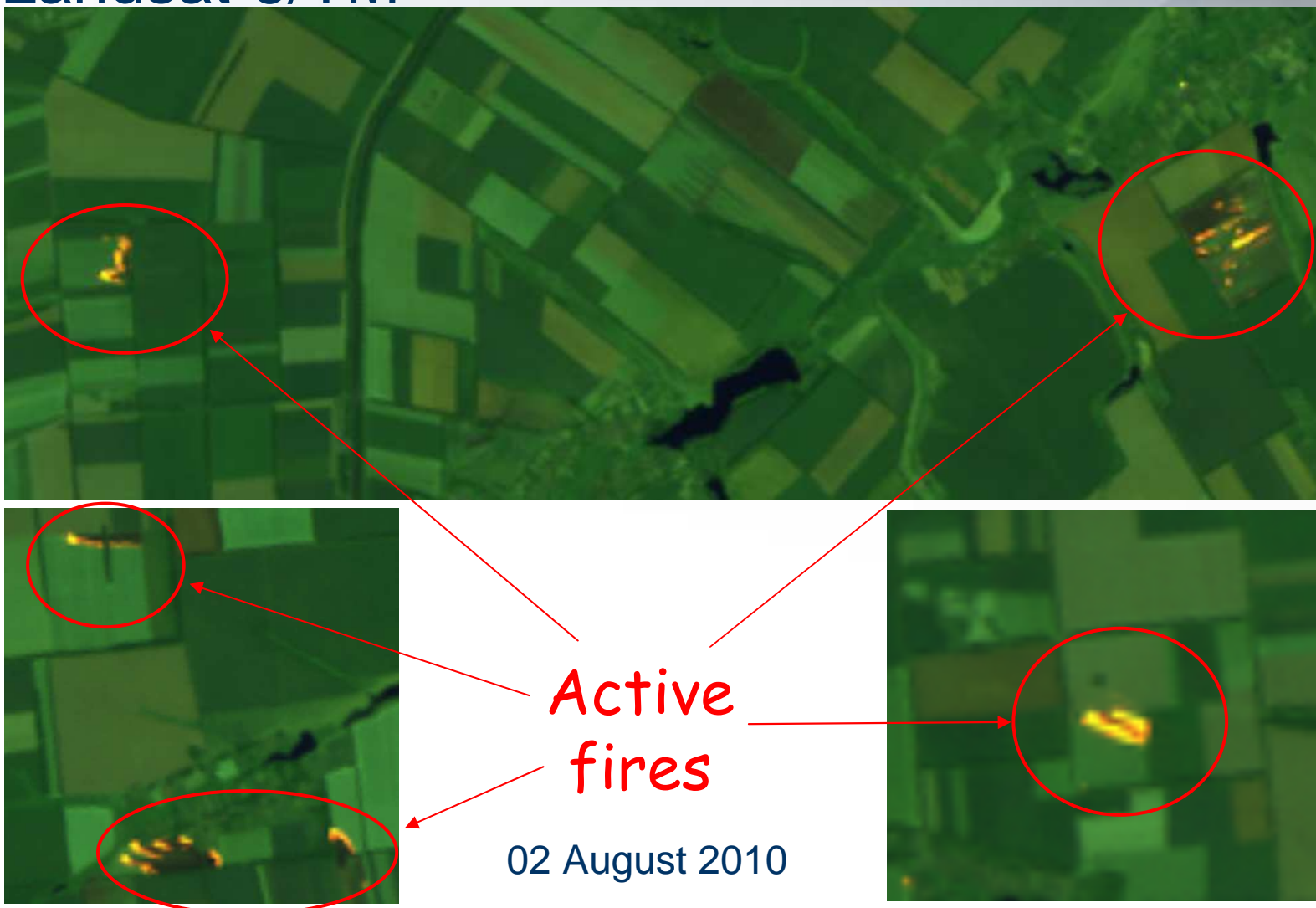
10, 9, 8 - active fires (appear in shades of red or yellow)



Application - cont



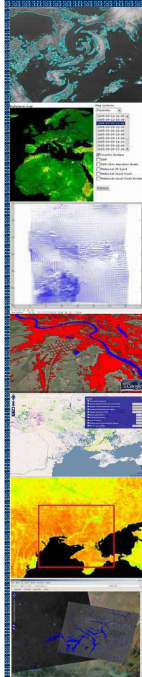
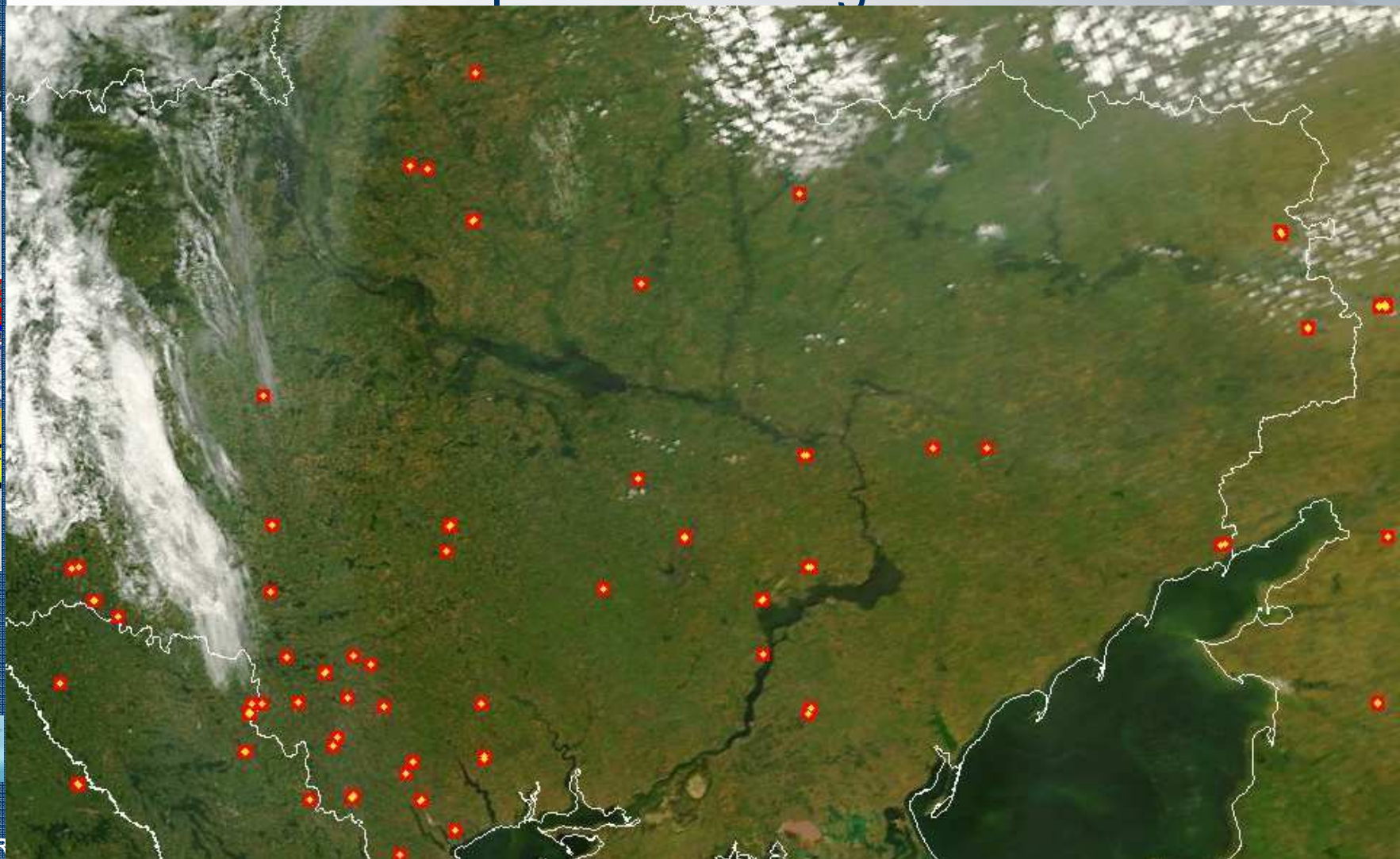
- Landsat-5/TM



Application - cont



- MODIS – hot spots – 02 August 2010

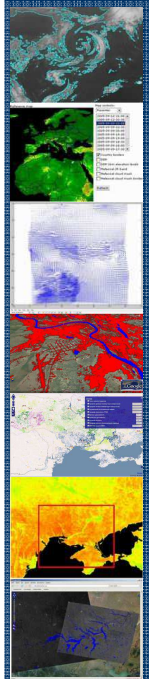
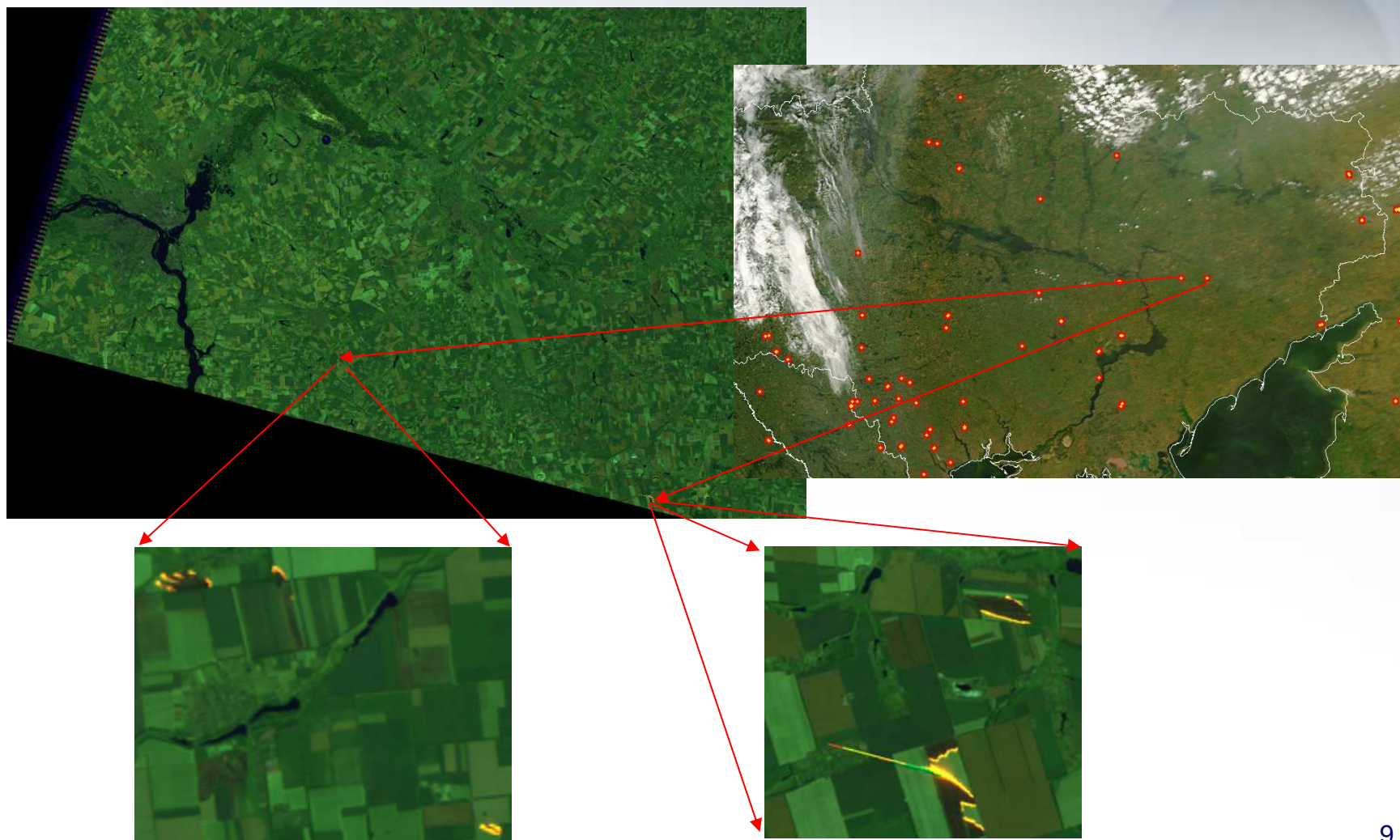


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Cross-validation



- 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](#)

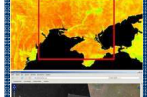
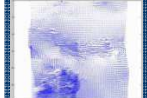
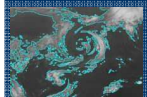
[22.02.2010]
[Snow cover and flood monitoring in Ukraine 2010.](#)

[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.



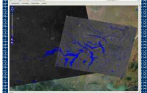
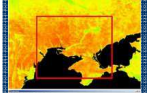
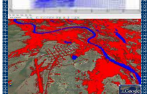
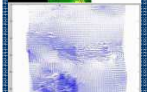
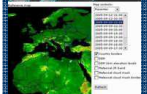
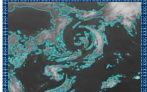
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Conclusions



- Satellite data are effective for fire monitoring in terms of:
 - coverage
 - timeliness
 - accuracy
- Data delivery latency
 - Medium resolution (~250 m – 1 km)
 - 4-6 h after image acquisition
 - High-resolution (30 m)
 - 6-48 h after image acquisition

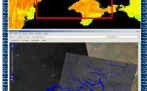
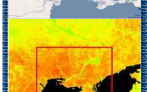
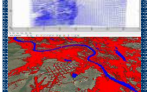
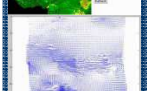
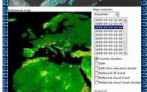
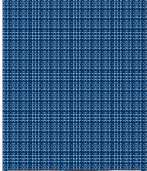


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Thank You!



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