DAMAGE ASSESSMENT FOR JALAL-ABAD, KYRGYZSTAN
Damage Analysis Based on Ikonos-2 Satellite Imagery Recorded on 21 June 2010

Overview of Building Damages in Jalal-Abad

Example (1) of Building Damages in Jalal-Abad

Example (2) of Building Damages in Jalal-Abad

Example (3) of Building Damages in Jalal-Abad

BUILDING DAMAGE CLASSIFICATION

Active fires by location

Active fire detected within 1km² area of MODIS satellite pixel

MISC. SITE IDENTIFICATION

DAMAGE BUILDING DENSITY

Note: Damage building symbols and imagery can be turned off for screen display or printing - See PDF Layers Tab at Left

Crisis Satellite Imagery: IKONOS
Resolution: 1m
Imagery Date: 21 June 2010
Pre-crisis Imagery: Worldview-01
Resolution: 54cm
Copyright: GeoEye 2010 & DigitalGlobe 2010
Fire Data: MODIS Aqua - Terra
Fire Processing: U. of Maryland, NASA
Fire dates: 9 - 14 June 2010
Admin. Data: OCHA
Analysis: UNITAR / UNOSAT
Projection: UTM Zone 43N, WGS-84

The depiction and use of boundaries, geographic names and related data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNOSAT is a program of the United Nations Institute for Training and Research (UNITAR) providing satellite imagery & related geographic information, research and analysis to UN humanitarian & development agencies & their implementing partners.

ANALYSIS NOTES: the following damage analysis is based on crisis satellite imagery from 21 June 2010 and pre-conflict satellite imagery from 9 Sept. 2009 and 9 July 2006. Affected buildings were classified as destroyed or severely damaged by standard image interpretation methods. The figures on building damages likely represent minimum estimates. Actual damages could be higher, especially for severe and moderate levels of building damages which are more difficult to identify with a high degree of confidence from the available satellite imagery. This is an initial damage assessment and has not yet been validated on the ground. Please send additions / corrections to UNITAR / UNOSAT at emergencymapping@unosat.org.

Contact Information: unosat@unitar.org 24/7 Hotline: +41 76 487 4998 www.unosat.org
Jalal-Abad, Kyrgyzstan Damage Assessment by UNITAR/UNOSAT – 30 June 2010

ANALYSIS NOTES: the following damage analysis is based on crisis satellite imagery from 21 June 2010 and pre-conflict satellite imagery from 9 September 2009 and 9 July 2006. Affected buildings were classified as destroyed or severely damaged by standard image interpretation methods. The figures on building damages likely represent minimum estimates. Actual damages could be higher, especially for severe and moderate levels of building damages which are more difficult to identify with a high degree of confidence from the available satellite imagery. This is an initial damage assessment and has not yet been validated on the ground. Please send additions / corrections to UNITAR / UNOSAT at emergencymapping@unosat.org.

DAMAGE ASSESSMENT SUMMARY:
This is a quantitative damage summary for the city of Jalal-Abad based on a detailed analysis of crisis satellite imagery acquired on the morning of 21 June 2010. A total of 330 affected buildings were identified within the city of Jalal-Abad. Of this total, 291 buildings were totally destroyed and 39 were severely damaged. An additional 28 potentially damaged buildings were identified outside the main damage clusters but were likely the result of normal construction/demolition activities unrelated to the recent conflict. In contrast with the city of Osh, no SOS distress signs or roadblocks were identified within Jalal-Abad.

As illustrated in the overview map on page three, a density analysis of the affected building sites indicated there is a single major cluster of destruction located along two major intersecting roads within the Kugartskaya Dolina area of the city. This single major cluster contains 69.4% of all identified damages for Jalal-Abad. Two smaller clusters have also been identified in the Khazret-Ayub suburb. Within these three spatial clusters there is a high degree of damage type homogeneity of almost 90% building destruction. The boundaries between affected and unaffected neighborhoods in Jalal-Abad are significantly more diffuse and poorly defined than in Osh.

A preliminary assessment of building damage signatures indicates that arson was the probable cause because of the prevalence of destroyed rooftops with visibly intact load-bearing walls, a common signature of fire-related damages. Although no active fires were detected in Jalal-Abad by satellite sensors (unlike in Osh and Bazar-Kurgan), this was likely the result of local cloud cover and/or the lack of sensor coverage when the fires were active. Because of this lack of corresponding sensor data, it is not possible to identify the probable date of when building damages occurred in Jalal-Abad.

A significant majority of affected buildings are directly accessible from main primary or secondary roads suggesting that the suspected arson attacks were perpetrated by individuals or groups who restricted their movement to these main transport routes. Almost all affected buildings appear to have been residential or situated within residential neighborhoods, however there are a few cases of destroyed or severely damaged industrial warehouses or commercial / government facilities. No damages have been observed to the transportation network (e.g. roads, bridges) or other key infrastructure sites within the city. The airport is likely fully operational and unaffected.

JALAL-ABAD DAMAGE ASSESSMENT BY CLUSTER SITE: (See adjacent overview map for exact location of damage clusters).

1) Damage Cluster 1: A total of 229 affected buildings were identified (201 destroyed and 28 severely damaged) in the Kugartskaya Dolina area, containing 69.4% of all identified damages in the city within this single damage cluster.

2) Damage Cluster 2: A total of 16 affected buildings were identified (13 destroyed and 3 severely damaged) within the first of the two smaller damaged clusters in the Khazret-Ayub area of the city.

3) Damage Cluster 3: A total of 64 affected buildings were identified (58 destroyed and 6 severely damaged) within the second of the two smaller damaged clusters in the Khazret-Ayub area of the city.

Each cluster has a corresponding focus map within the report.
MODIS Aqua and Terra Satellites
OVERVIEW OF DAMAGES IN JALAL-ABAD

Damage Analysis Based on IKONOS Satellite Imagery Recorded on 21 June 2010

Damage Analysis Summary: A total of 330 affected buildings were identified within the city of Jalal-Abad. Of this total, 291 buildings were totally destroyed and 39 were severely damaged. 69.4% of identified damages were concentrated in a single large cluster along two major intersecting roads within the city center. Two smaller clusters were also identified in the Khazret-Ayub suburb.

Building Damage Cluster 1:
- 201 destroyed
- 30 severely damaged

Building Damage Cluster 2:
- 13 destroyed
- 3 Severely damaged

Building Damage Cluster 3:
- 58 destroyed
- 6 Severely damaged

No damages to main airport facility

Density of damaged buildings: red to blue shift indicates increased
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Damage Site Classification
- Building: Destroyed
- Building: Severely Damaged

Misc. Site Identification
- "SOS" Distress Signs
- Roadblocks

Map Scale for A4: 1:2,750
Data Frame rotated 76 degrees from North
UNITAR/UNOSAT
satellite solutions

The UNITAR advantage
Since its establishment in 1965, UNITAR has built a unique set of expertise, experience, knowledge and capacities to design and implement a variety of research and training activities. In keeping with its mandate to "enhance the effectiveness of the United Nations in achieving the major objectives of the Organization" the Institute contributes with concrete actions to developing the capacities of Member States in the fields of economic and social development, diplomacy, and peace and security.

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UNITAR programmes provide training to approximately 80,000 professionals every year in some 200 different types of training activities, applying both face-to-face and distance-learning methodologies. Technology and satellite applications are gaining an important place in these activities as a growing number of UN and national entities adopt satellite derived geographic information methodologies in which UNOSAT, the Operational Satellite Applications Programme of UNITAR, excels since 2001.

A challenging mission
UNITAR mission is to deliver innovative training and conduct research on knowledge systems to develop the capacity of beneficiaries. Building on our experience, we optimize expertise, information and knowledge-sharing to achieve this mission. The specific mission of UNOSAT is to develop applied solutions and use training to make the UN system and member states benefit from space technology in the areas of human security and humanitarian relief, disaster prevention and territorial planning, and all other relevant areas.

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Since 2001, UNOSAT has delivered satellite solutions to relief and development organisations within and outside the UN system and member states to help make a difference in the life of communities exposed to poverty, hazards, and conflict or affected by humanitarian and other crises. Our skills are focused on satellite derived geographic information and data analysis. Our work record includes over 1000 analyses since 200, and 150 activations during humanitarian crises since 2003. UNOSAT is also a specialised training force with capacity to train national experts in situ or at headquarters in Geneva.

For information and contacts: Unosat@unitar.org or www.unitar.org/research

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