

Space Monitoring of the Olympic Construction

On perspectiveness and promptness of applying materials of Earth remote sensing from space to assess impacts and monitoring of facilities and infrastructure construction in preparation to the 2014 Olympic Games please read the article “Space Monitoring of the Olympic Construction”, published in GeoRisk Magazine #3/2009.

A.A. Lukashov, Professor of Geographic Department, Lomonosov Moscow State University, and N.V. Pupysheva, Press-Secretary of ScanEx RDC, used multi-temporal space imagery data to demonstrate efficiency of remote monitoring in detecting dynamics of dangerous geomorphologic and geologic engineering processes within and outside the coastal margins.

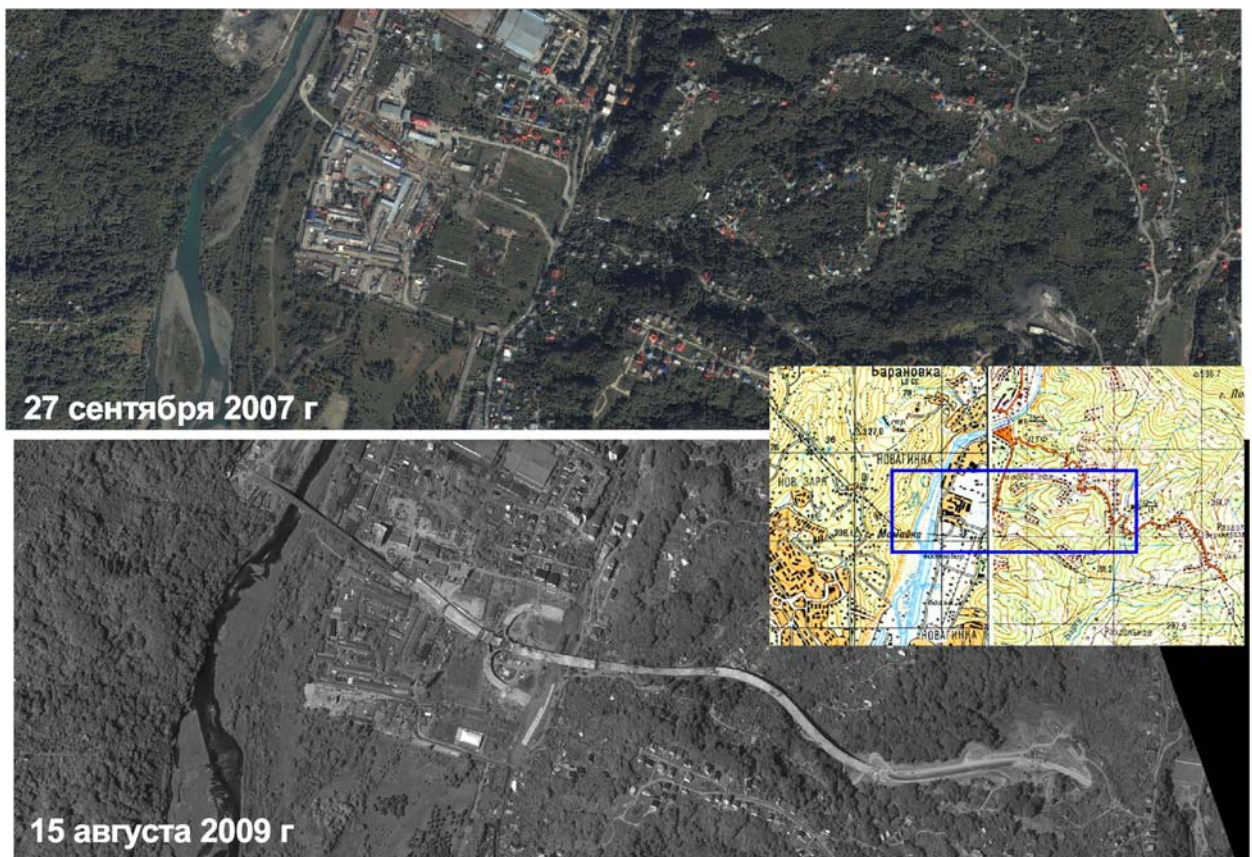
«[...] This information is important not only for regulatory agencies but also for the companies carrying out construction and operation of the facilities and infrastructure in order to avoid possible penalties or conflicts of interests with any economic entities, nature protection and ecological structures including those of international nature. The large-scale on-going construction inevitably interferes with quite vulnerable landscapes of subalpine meadows, euxinic wet mountain and submountain forest as well as river beds and first bottoms in Western Transcaucasia partially belonging to protected natural areas of Sochi National Park. Intensive area exploration could develop over the coastal zone and offshore area of the Black Sea having existing unstable balance of litho-dynamic flows. Operations also affect large area being rich in archeological sites. [...]

[...] Danger to archeological integrity of the Olympic development region is defined by a series of already found sites, cases of their partial destruction and justified prospects for detecting new objects. In addition to commonly known ruins of middle age fortresses where the Achipse River meets the Mzymta and on the right bank of the Beshenka River two kilometers upstream its meeting with the Mzymta the following sites are best studied: (1) cave site of Mousterian period of early paleolith - 1.5km south-west from Kepchy settlement at the foot of Akhtsu limestone massif at the height of 80 meters over the Mzymta water line; (2) farming sites dated IV - early III millennium in Moldovka and Akhshtyra; (3) Akhshtyra cave town-site of early bronze period; (4) up to a dozen of dolmen-like well type graves in the area of Krasnaya Polyana dated XVI–XIV century BC; (5) remains of early antique settlements along the sea coast in lower courses of the Mzymta and Kudepsta; (6) late antique sepulchral complexes of Krasnaya Polyana. One of these sepulchres was accidentally exposed (and destroyed) in 1942 while excavating a meter-deep trench at the road fork to “the hunter’s shack” and to Estosadok settlement at the north-east skirt of Krasnaya Polyana. Attitude of care towards yet not surveyed cultural layer missives shall be strictly observed including use of remote methods.

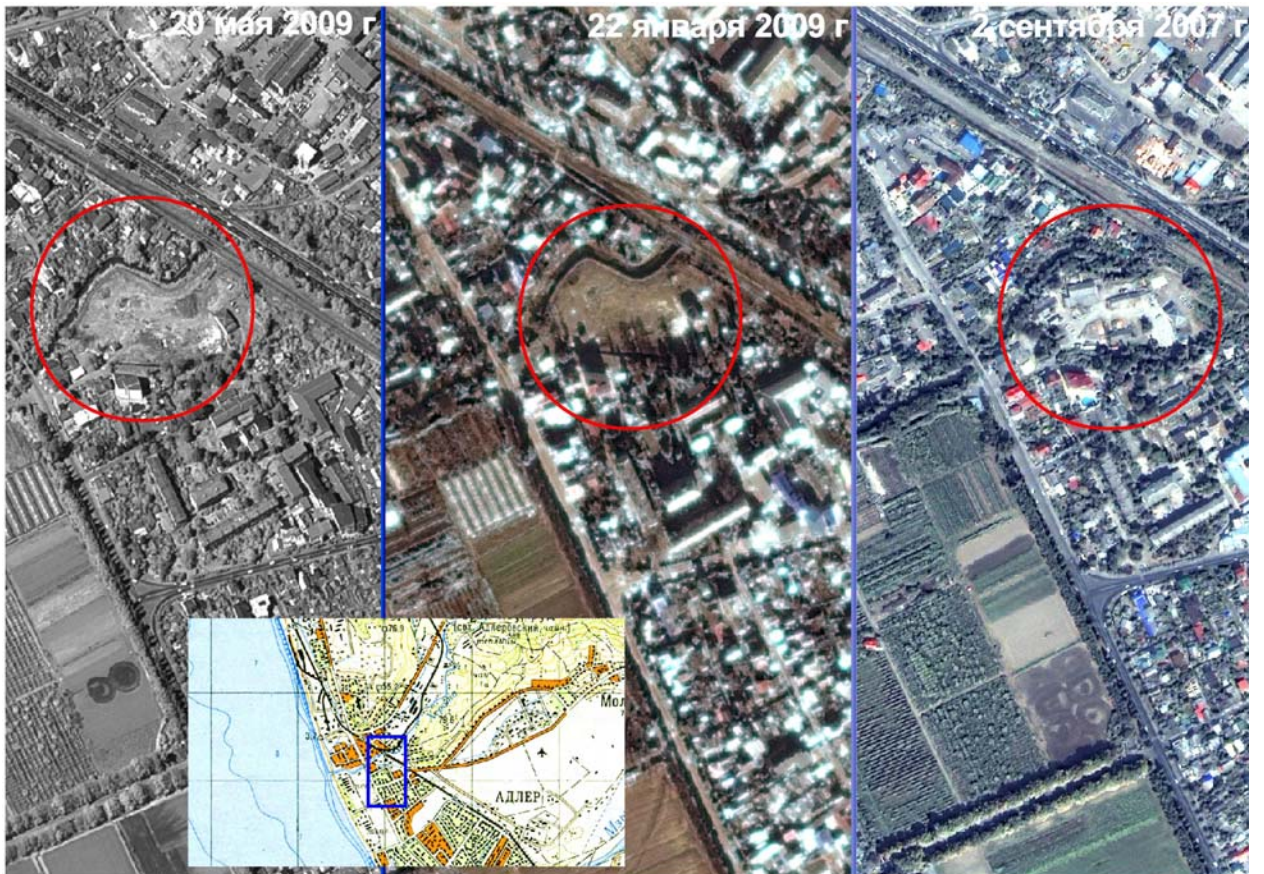
Potentially negative changes in the coastal zone and offshore shallow waters are possible and primarily in event of implementation of the plans for building a leveed land in Sochi region. The reference is made to possible implementation of the concept proposed by Dutch architect Erik Van Egeraat. It suggests building “Federatsiya” island across from Maly Akhun of the Khosta Region. The Black Sea shore in this area is subjected to wave abrasion. Destructive bottom washout aggravated after erection of port breakwater piers that blocked along-shore drift flows at a number of locations. South from Sochi Port a washout was taking place in few years at the rate up to 4 m per year. Full destruction of the 30 meter wide beach required dumping of fragmentary material to stabilize the shore. Abrasion in combination with abrupt depth increase in the offshore zone as well as with absorption of shallow water drift flows by tops of neighboring underwater canyons leads to difficulties in implementation of planned actions. In carrying out offshore and onshore work use of space monitoring will help preventing

unfavorable course of technogenic interference in the dynamic environment of the offshore coastal area. [...]

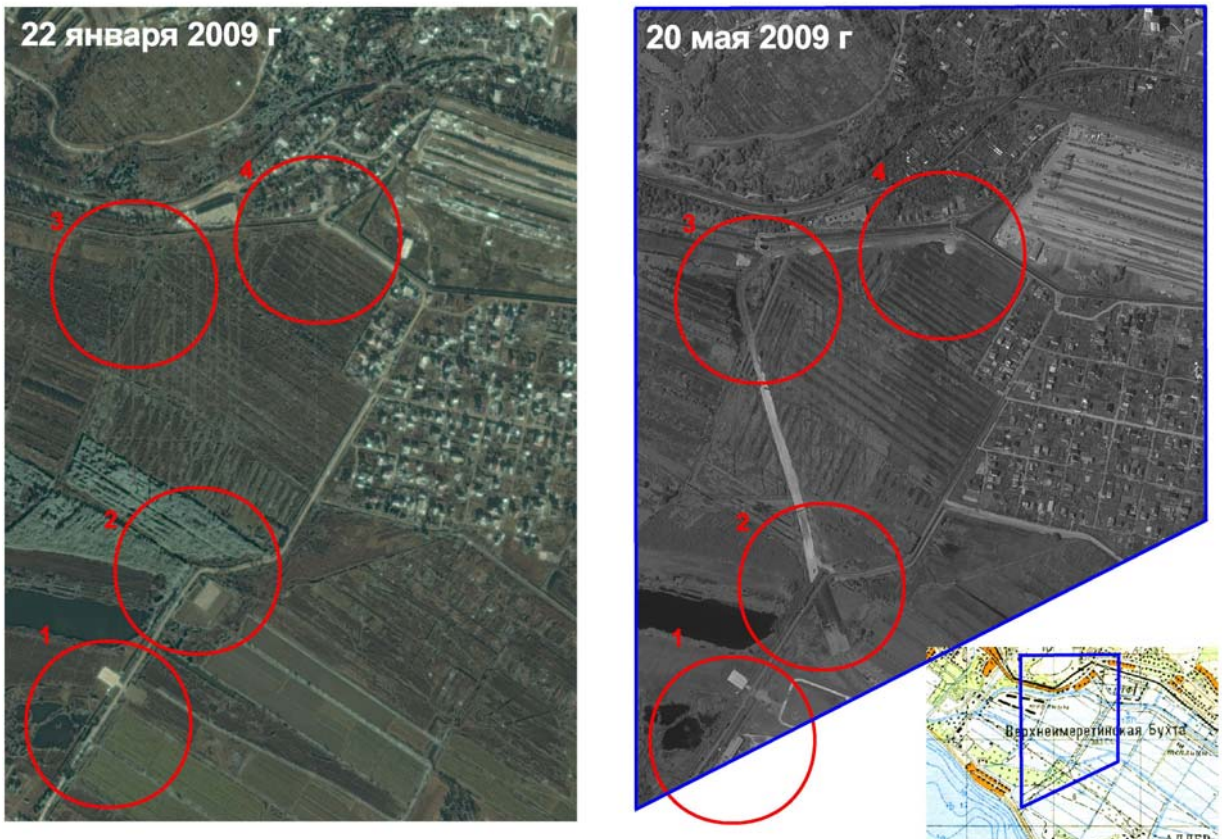
[...] An example of violating integrity of especially valuable landscapes, which space monitoring facilities are capable of handling, can be demonstrated by the situation occurring at the boundary of the protected natural areas on the left bank of the Mzymta River. Currently in the valley of the Mzymta alone public inspections carried out by Environment Watch for the North Caucasus resulted in detecting at least seven sites of large scale uncontrolled forest felling not to mention numerous instances of illegal construction. In the first block of Veselovskoye local forest division in the Mzymta riverside a part of virgin forest was cut, the understorey of which was comprised of Buxus Colchis that is prohibited to be cut. [...]».



Construction of a motorway. Top: image of IKONOS. Bottom: image of EROS B (GeoEye, ImageSat, SCANEX, 2007, 2009)



Area cleaning for construction purposes. Right and center: images of IKONOS. Left: image of EROS B (GeoEye, ImageSat, SCANEX, 2007, 2009)



Road construction. Left: image IKONOS. Right: image of EROS B (GeoEye, ImageSat, SCANEX, 2007, 2009)