Everything is Seen from Above—in the Kuban Satellites are Used to Fight Fires

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Satellite Monitoring of Agricultural Holdings at the Krasnodar Krai Ministry of Agriculture

The Ministry of Agriculture of Krasnodar Krai has begun using a system of satellite monitoring of agriculture holdings and the public web service <maps.krasnodar.ru>, with the help of which it hopes to effectively battle agricultural fires in the region. As the Ministry of Agriculture of the krai notes, even a single reminder that agricultural producers who burn are under satellite observation was sufficient to forestall mass burning of rice straw last year.

--Dmitry Shevchenko, March 3, 2014

Space Technology Against Fires and the Encroachment of Forest and Water Protection Zones

One wall of the Ministry of Agriculture of Krasnodar Krai is a huge monitor consisting of 8 plasma panels. From within this one room specialists in satellite monitoring of the earth's surface can obtain almost any kind of information about agricultural holdings—the structure and acreage under tillage, soil and crop conditions, whether necessary crop rotation is maintained and much more.

The idea to monitor agricultural lands with the help of cosmic technology arose in 2009 when the regional authorities and agrarians themselves became aware of "precision agronomy," through which each square meter of crop land can be monitored and controlled.

"The first task was to determine the exact extent of agricultural holdings, and it was shown that these are often not the same as the cadastre (land registry) boundaries. In places the area was smaller because of the expansion of the ravine and gully system; in other places the opposite was the case and producers had tried to expand holdings by encroaching on rural roads, the forest belt or water protection zones. High resolution satellite monitoring allows us to

determine what, where and how much is being cultivated to a meter's precision. We have found that in Krasnodar Krai the actual boundaries of many agricultural holdings do not in many cases coincide with the documents of Rosreestr (Federal Service for State Registration, Cadastre and Cartography), and we need to do something about this," says Igor Kozubenko, the head of the Department of Informatics and Analytical Systems of the Ministry of Agriculture of Krasnodar Krai.

In his view, space technology has facilitated tremendous work in less than five years in the inventory and registration of agricultural objects such as fields, farms, fisheries, grain elevators, food processing facilities and much more. Now the Krai Ministry has more or less complete information on agricultural production and financial indicators, their technology, tax payments and government supports. "We even get information on daily biomass growth on each field," adds Kozubenko.

Last summer the Ministry also added a system to monitor burning of stubble and crop residues and open fires in the fields of Krasnodar Krai. Now it is possible to determine stubble fire points with a few meters' precision. Greater accuracy is possible but would require paying for cosmic pictures of greater precision, which would take quite a chunk out of the budget. And in the words of Igor Kozubenko, "we can use free American web resources that have completely adequate locational accuracy."

"Fire information is collected four times a day, the pictures go through digital processing and each morning we produce a pdf-report. If we see that someone is burning somewhere, we contact the head of the region in question—the head of the regional directorate of agriculture. They organize a site visit for ground-truthing and work with the guilty agricultural producer. We have found that there are almost no mistakes and the system for pinpointing fires is quite accurate," say Kozubenko.

It must be said that that the Ministry admits that satellite monitoring of fires is not used for punitive purposes. First, the Ministry itself does not have the authority to impose penalties, and second, the resource at <maps.krasnodar.ru> is being positioned as a public use space. In the future the information it contains can be used by local authorities and the general public.

The innovation has had a serious impact on the agricultural producers themselves. Igor Kozubenko ads a notable fact—last year the very notification about the system of satellite monitoring of agricultural fires was sufficient to hinder mass burning of rice straw, the use of which presents a huge problem.

"in September-October when there is usually massive burning of the rice fields, we are able to see on the archived photos that there was almost none," notes a specialist who is showing cosmic photos of the rice growing regions of Krasnodar Krai on the wall screen.

Coordination of the "Seven Nannies"[1]

The current system costs the budget about 40 million rubles, including servers, program services and the educational and demonstration centers. An interagency geo-information system is planned to make this resource use more effective. For example, the oversight department for co-funded construction created an interactive map of illegal construction. Other departments have shown similar interest.

However, with regard to using the <maps.krasnodar.ru> service as a universal space for monitoring agricultural fires, the many agencies responsible for this activity have not been able to agree on joint work.

For example, it is known that the regional directorate of the Ministry of Emergency Situations (MChS) supports its own fire monitoring system. According to some, the Ministry of Natural Resources of the krai is also interested in its own system of satellite monitoring.

There is the danger that interagency disagreements and the desire of each of the "seven nannies" to have its own exclusive system for satellite monitoring of open fires means that nothing will come of any of it. It is necessary not only to collect data and put fire points on a map, but also to analyze the reasons for burning, identify losses, find and sanction the guilty, and work with the farmers, fishermen, forest users and hunters—in other words, to develop a menu of essential services and programs, which Krasnodar Krai hardly does.

And the "fear effect" should not be counted on in the long run for distance monitoring of agricultural territories. The agricultural producers who practice burning stubble and straw will quickly come to understand that oversight "from above" leads to no sanctions and they can freely revert to traditional activities.

--Translated by Gail Stevenson, ICCI Russia Program Director

[1] "With seven nannies, no one is watching the child"—Russian proverb