

Remote sensing* and forensic investigation.

*We are using remote sensing in a wide sense. Satellite, aerial and drone's images are included.

Remote sensing in forensic investigations is becoming crucial as source of data in many cases, It is a new application of images, satellite data and conventional aerial and drone images to get information about present and past. These kinds of applications have demonstrated to be very useful in due diligences process, case presentation in the court, corporate merger and acquisitions process, tender preparation...etc.

Additionally, this kind of applications demonstrates that today remote sensing is an extraordinary source of information for the management of different business. Even more, when AI (Artificial Intelligence) is opening new ways for the business.

What is a forensic application of remote sensing?

Argongra is using remote sensing data to rebuild the history of any territory.

Governments and even some private companies take systematically remote sensing images of terrestrial surface. These images are archived and they can be recovered anytime.

Remote sensing images are raw documents that must be analyzed to get useful information. But they are an objective trial and image seller can certificate their origin (date and technology used).

Probably remote sensing images are the most important archive that the world has about evolution of earth surface during the last 40 years or even more. To get remote sensing images (from plane) from 80 years ago is possible in most countries.

Frequency and image quality have been improved dramatically for these last years. 40 years ago, we had satellite images with a pixel resolution of 100 m, and images from plane in black/white: Now we have resolution from satellite of 30 cm and images in natural color, infrared color or even radar images. But, in even more important in some cases, there are two additional advantages, first. - to recover a lot of images, in some few hours is possible now, second. - costs, to get these images, have been reduced dramatically.

Thanks to remote sensing data is possible to rebuild the history of any territory. This is the main objective to use historical images in forensic investigations in relation with topics like: environment, mining, civil

works, oil&gas, forestry, water, and a very long list of issues.



Images of Argongra office area in Madrid.
Above. - year 1927, Center. -year 1956, Below. -year 2014
Source: <http://www.madrid.org/cartografia/planea/>

Two examples

The applications are numerous and two of them are shown below

Soil contamination and due diligences

When a real estate developer buys a land or a company wants to buy a facility from a third party, they need to know if there is a possibility in the plot of

having land that is contaminated. The official records are not, in general, useful because this type of information has not been registered until very recent dates. That is why a work of forensic reconstruction of uses of the site must be done. Aerial photographs and satellite images play a fundamental role because they constitute a historical and objective record of the plot situation for several tens of years.



Above, two images of the same industrial site can be seen, in different years. 2004 on the left and 2016 on the right. In this period factory and its auxiliary elements have been demolished. Anyway, 2004 image has enough information to know where it is necessary to look for a possible soil contamination, deposits, ponds, electrical transformers, etc..

Insurances

When an event occurs, the insurance companies are faced with the need to know the situation before, during and later the event. The before situation can be analyzed with historical images and the evolution during and later with images acquired "ad hoc".



Pleiades Satellite Image - Tripoli, Libya

Although medium resolution images (up to 10 m/pixel sizes) are taken systematically by space agencies of different countries, for high resolution images do not occur the same. High-resolution images should be asked in advance if you want to be sure that in the future there will have available images.

Forensic investigations are greatly improved if you have an image acquisition program before and after the event. Today, the costs of programming and

acquiring satellite images have been dramatically reduced. Therefore, to propose a program of acquisition of systematic images on a specific site is a possibility that both, insurance companies and the insured has. Images are also useful for management different issues in the company, from environment to safety.

Argongra services.

Monitoring services.

Information services about industrial sites in relation to Due Diligences, Tenders, Insurance, etc

Inputs

From client

- Objectives'
- Area of interest
- Private mapping (if it exists)).
- Main dates in relation to expected events (if they are).
- Additional info

Argongra

- Selection of historical images (sensor, date,...)
- Program to acquire new images.
- Acquisition of public maps

Development

This depends on the requirements and objectives of the client. Common issues are:

- Installations mapping. 2D and 3D are possible
- Detection of relevant changes inside work areas. Historical development.
- Detection of relevant changes around work areas. Historical development.
- Earth movements. Quantitative analyses are possible.
- Stocks valuation.
- Spills valuation.
- Ponds valuation.
- Detailed analysis of points of interest.
- Waste management.

Output

Argongra delivers:

- Conclusions report. Signed report to be used in the court, if it is the case.
- Maps with more relevant information
- Listed of material used.
- Detailed description of elements identified on the image, position, surface, volume, etc.
- Original and corrected image for project acquired images
- Certificate of authenticity of images acquired in digital format.
- Argongra offers support for audiences if it is requested.