

Fieldwork campaign in Ruqigou coalfield, China

This project entitled 'Development and implementation of a coalfire monitoring and fighting system in China' is a collaborative project between the BRSC (Beijing Remote Sensing Corporation) and a Dutch consortium, which consists of EARS (a private company), RGD (Geological Survey of the Netherlands) and ITC. It is sponsored by the Chinese and the Dutch Government. This three year project started in July 1996 and aims at setting a prototype GIS for coalfire management. Information from remote sensing images, geological studies, geochemical studies and other field studies form the basic inputs in this GIS.

Site selected/ Study Area

Photo 1:
The ITC team.

Photo 2:
Cracks occur as a result of land subsidence where underground fires diminish the thick coal layers.

Photo 3:
Smoke and steam show where the coal is burning. Steam usually occurs where water is injected for fire fighting.

Photo 4:
Coalfires damage coal reserves, risk human lives, pollute the environment and create obstacles for mining.

Photo 5:
Several underground mines exploit the main coal seams.

Photo 6:
Measurements with hand-held thermometers were not the most pleasant part of the fieldwork.

Photo 7:
Thermal imaging camera was used for identifying the coalfire affected spots on the surface.

Photo 8:
GPS was used to locate the measurement spots.

Photo 9:
Detailed geological measurements, samplings and observations were carried out.

Figure 1:
Location of Ningxia Hui Autonomous Region and the time bar of the project.

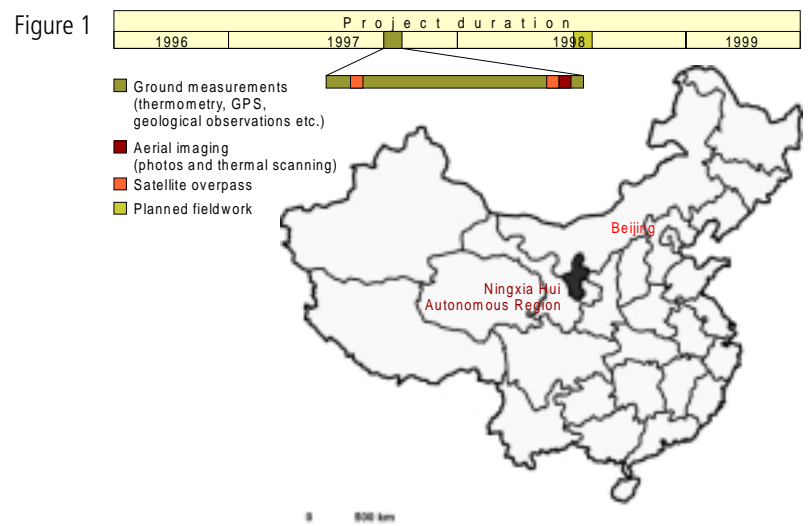
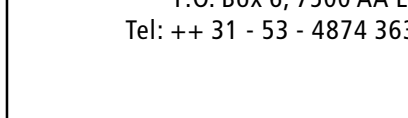
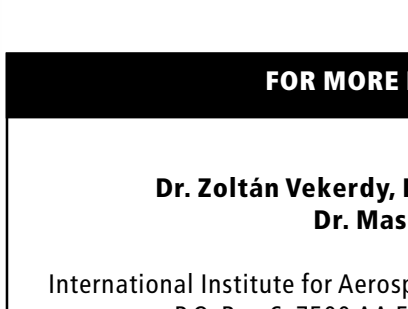
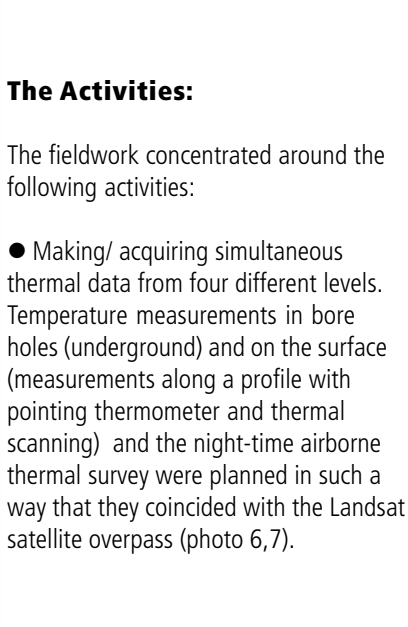
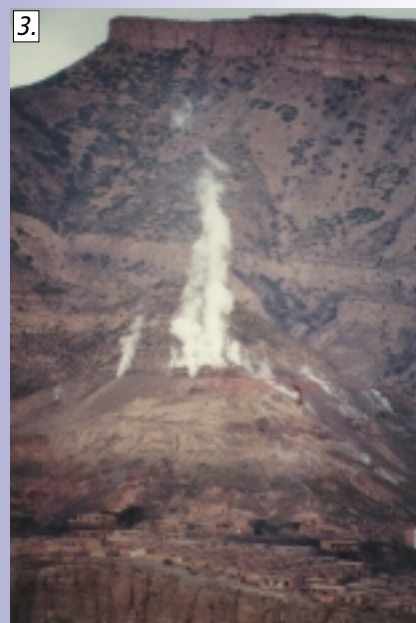
The site selected for this study is the Ruqigou coalfield in the Ningxia Hui Autonomous Region in North-Central China (Figure 1). This is a typical example of a coal mining area which faces all the usual problems associated with coal mining, viz. occurrence of coalfires, mining induced subsidences and a high level of air pollution.

Fieldwork

The Team: Three ITC personnels with different expertise along with their Dutch and Chinese project partners, carried out a detailed fieldwork during September 1997 (photo 1).



Most interesting phenomena were captured by the cameras. Massive crack structures, smoke and steam emitting vents, blazing coalfires, opencast and underground mining sites and areas with high pollution levels were among the most striking features observed in the field (photo 2,3,4,5).



● GPS measurements: High precision GPS were used to measure several locations in the field. Parameter of transformation were computed to transform the GPS coordinates to the local coordinate system (photo 8).



● Geological sampling: Several coal samples were collected from different coal seams. The sampling was done to cover the entire study area (photo 9).

● Spectral measurements: These were made specially for coal samples, burnt rocks, sandstones and shales at different sites.



Fieldwork results:

● Surface temperatures were measured at 142 reading points. Both day and night measurements were taken. Round-the-clock measurements were also made for some specific sites.

● Gas-temperature of 6 boreholes was measured.

● At 120 locations, high precision GPS measurements were made.

● Thermal scanning was done for 13 different fire sites, during day and night.

● 98 coal samples and 2 rock samples were collected.

● Spectral measurements were made at 20 different locations.

● 4 level measurements were carried out two times.

These data serve as the backbone of the coalfire monitoring and fighting system to be developed in the next phase of the project.

FOR MORE INFORMATION:

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