Environmental geochemistry of the Second Songhua River in Northeast China

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Water environment has attracted people's attention due to its close relationship with the people's life and environmetal investigation and evaluation of the many large river have been carried out in the world. As a tributary of the Songhua River in Northeast China, the Second Songhua River is the largest river in Jilin province and water environment is essential for local residents. In order to investigate the water environment of Second Songhua River, water, sediments and suspended matter were sampled and many heavy metals (As, Cd, Cr, Cu, Hg, Pb, and Zn) and some organic pollutants (polycyclic aromatic hydrocarbons, phthalic acid esters and BTEX) were analyzed.

The results indicated that the content of heavy metals and organic pollutants of water were relatively low, while those of sediment were relatively high. Levels of contaminants in suspended matters were changed greatly. The content of heavy metals and organic pollutants tend to increase first and then decrease along the main river and this variation was influenced mainly by the industrial and agricultural activities in the drainage area.

The applications of photogrammetric technology in the deformation measurement based on CCD camera

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Optical three-dimensional measurement method is a non-contact, high precision, convenient and quick measurement method. The main topic is to research the applications of the technical architecture of digital close-range photogrammetry in the deformation measurement. There are two main aspects of deformation analysis, one is the monitoring data and information collation, analysis and interpretation, including gross errors excluding, monitoring data de-noising, etc.; the other is the structure of the security and stability of the state of assessment, prediction and forecasting to ensure the structural safety in construction and operation process.In this area, in addition to traditional statistical analysis methods, there are many methods based on fuzzy mathematics, gray theory, artificial neural networks, time series theory and so on. The subjects using the widely used CCD camera as a tool, according to the classical principles of photogrammetry and the latest research results of image processing and computer vision, study the three-dimensional measurement theory of not calibrating CCD camera under the control of nothing, or lacking material conditions, and provide a set of feasible three-dimensional measurement method. Take the displacement measurement in civil trials for example, using Matlab as tools develope a practical calculation procedures.