# PROJECT PROFILE

## SATELLITE IMAGERY CLASSIFICATION FOR STUDY AREAS IN CENTRAL CHINA

D'Appolonia was a member of a consortium that provided technical services related to evaluation of environmental conditions and changes in these conditions with time for six study areas in central China. In the past decade, industrialization and associated exploitation of natural resources has heavily impacted and is still affecting the natural environment in China. The overall goal of the work was to provide the basis for Chinese decision makers to determine the most suitable countermeasures to mitigate and inhibit impacts on the environment and to develop feasible guidelines and policies to protect and improve the quality of the natural environment while allowing for continued economic development and utilization of natural resources.

Six areas in central China were targeted for implementation of this program. The project had the following objectives:

- Evaluation of environmental conditions and changes in the six target areas utilizing the earliest available and most recent remote sensing satellite imagery
- Establishment of current methodologies for evaluation of the natural ecology utilizing remote sensing techniques
- Development of a database of environmental/ecological data for each of the six target areas
- Preparation of comprehensive reports documenting environmental and ecological conditions for the six target areas
- Identification of emerging environmental and ecological problems in the six target areas
- Development of environmental protection and remediation strategies for central China

A two-week training seminar for senior Chinese officials related to application of Geographic Information Systems (GIS) and remote sensing techniques for evaluation of environmental and ecological conditions was held in the fall of 2003 and a second training session was held in early 2005. The Chinese officials at the seminars included representatives of the Chinese State Environmental Protection Administration (SEPA).

Landsat 5 and Landsat 7 imagery for the six target areas for two dates (1986 and 2001) was provided by the Chinese for classification relative to land use and environmental conditions. Some aspects of interest included:

- Land use/land cover
- Water resources
- Urbanization
- Agricultural practices
- Vegetation/forest cover
- Soil erosion/desertification
- Water quality/pollution sources

D'Appolonia performed classifications on Landsat imagery provided by the Chinese using the ERDAS IMAGINE software. Classifications were completed for the Three Gorges reservoir area along the Yangtze River and for the Wuyi Mountain area. ArcView GIS software was used to combine classified



*Vegetation classification for the Wuyi Mountain study area.*

images from the Three Gorges area into a large single image. Ground truthing was performed to verify the classifications, and reclassification was performed based upon the ground truthing data and the results of discussions with local environmental experts in the study areas.

The project concluded with a presentation of study results in Beijing in May 2005. At that time it was indicated that the work would be extended. Future studies will involve advanced remote sensing techniques, including data obtained by sensors with advanced radiometric and spectral resolution.



*Satellite image showing the central China location of the six project study areas.*

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