

ArcPad and PDA Technology Streamlines Field Surveys in Saudi Arabia



In order to facilitate the Kingdom of Saudi Arabia's survey of marine, coastal, and terrestrial resources, Ecology and Environment, Inc. created a customized personal digital assistant (PDA) application that allows field teams to simultaneously collect data point locations and associated data on a hand-held computer. This solution is helping the client streamline its field surveys and improve data quality.

The survey covers huge distances. Given this geographic challenge, the volume of data involved, and an aggressive schedule, Ecology and Environment, Inc. designed a customized field pack—a Compaq iPAQ PDA connected to a barcode scanner, ESRI's ArcPad and a Trimble GPS unit. Field teams can navigate to a pre-determined survey area and get an accurate idea of site conditions by using the GPS and digital map backdrops such as satellite imagery. The scanner is used to read pre-labeled barcodes on sample collection bottles. Perhaps most importantly, both scanner and GPS data feed into standardized electronic forms so

that all field team members gather the same kind of information in the same fashion. The resulting database on each PDA is in turn electronically uploaded into a central database that is accessible through a secure extranet site, developed in ESRI's ArcIMS, so the management team can view and query both the spatial and analytical data.

Tony Zoccolillo, a programmer for Ecology and Environment, Inc. (E & E), stated that the application should streamline field operations significantly. "In the past, you would have a person who collected location information, either with a GPS or through a manual survey, and you had field crews collecting sample information in notebooks. The data was merged back at the office, with data transcription errors resulting in erroneous and missing data. By collecting all the data on one device at the same time, errors are minimized and post-processing operations are reduced," he said.

E & E selected ArcPad 6.0 from ESRI because of the needed mapping functionality and the recording of spatial information. ArcPad 6, can collect real-time electronic data from a wide variety of GPS protocols, such as TSIP and NMEA, making it usable with nearly any commercially available GPS product. It directly supports common imagery such as JPG and MrSID imagery and the industry standard Shapefiles data types. New shape data, such as points, lines, polylines and polygons, can be created by hand or from data received through the GPS. ArcPad 6 has built in support for the VBScript programming language, allowing the developer to write custom scripts for a multitude of potential functions, i.e., creating buffers, querying data, special calculations or numeric conversions, or validating form data inputs.



The Saudi application was a step in the growing use of PDAs at E & E. The field PDA has applications for many of our current and future projects. It is being used in a similar project in Kuwait, on a pipeline project, for managing hazardous waste on US Air Force bases, and for an east coast forestry consultant. We currently have another project near completion for the EPA to catalog uranium mines. Basically, these units extend the network client computer to the field and will be an increasingly integral component of the field data collection and integration process. E & E is also looking into the next generation of wireless technologies and the use of tablet PCs in our continuing effort to maximize productivity.