Integrating ArcPad into Municipal Services

The Regional District of Okanagan-Similkameen (RDOS) is located in south central British Columbia and encompasses the lower Okanagan and Similkameen Valleys, north of the Washington State boundary. The area offers a mild climate, scenic environment, and wide variety of recreational opportunities to its population of approximately 78,000.

From 1994 to 2001, GIS at RDOS focused on capturing approximately 16,000 land parcels in CAD format. In 2001 they increased the presence of GIS in the organization and migrated their data to the ArcGIS suite of products. The GIS team quickly began building applications to share this data with internal staff. Within six months the team had implemented an ArcIMS application for internal staff to access, view, and query GIS information including cadastral, civic, ownership, legal, tax code, assessed values, topographic, water systems, sewer systems, and various other data layers. The application allows these users to select parcels, generate buffers, and create mailing lists directly from their web browser.

In 2001, two ArcPad applications were built to track noxious pest control programs in the region. Based on the success of these initial applications, RDOS has expanded the use of ArcPad in 2002 with three new applications related to the region's water systems. A common goal of all five applications is to improve access to data collected in the field by staff in the office and local board members.

According to Tim Bouwmeester, GIS Coordinator, RDOS, there has been strong management support for these projects from the beginning. "Our Public Works and Engineering Manager was especially eager to apply new technology to improve efficiency in distributing important information to local staff and the public, and he was a key factor in the success of these implementations."

ArcPad for Noxious Pest Control

As part of the noxious pest control program, two ArcPad applications were implemented, one for tree fruit pest control and the other for mosquito control.

To protect the commercial fruit industry in the South Okanagan and Similkameen Valleys, one of the main fruit producing areas in Canada, the RDOS has renewed its Noxious Insect Control Bylaw. This Bylaw helps to ensure better control of fruit tree pests, which can cause substantial economic damage. For example, if one cherry fruit fly larva is found in a shipment of cherries sent to the United States, the entire shipment is destroyed or sent back, with considerable economic consequence.

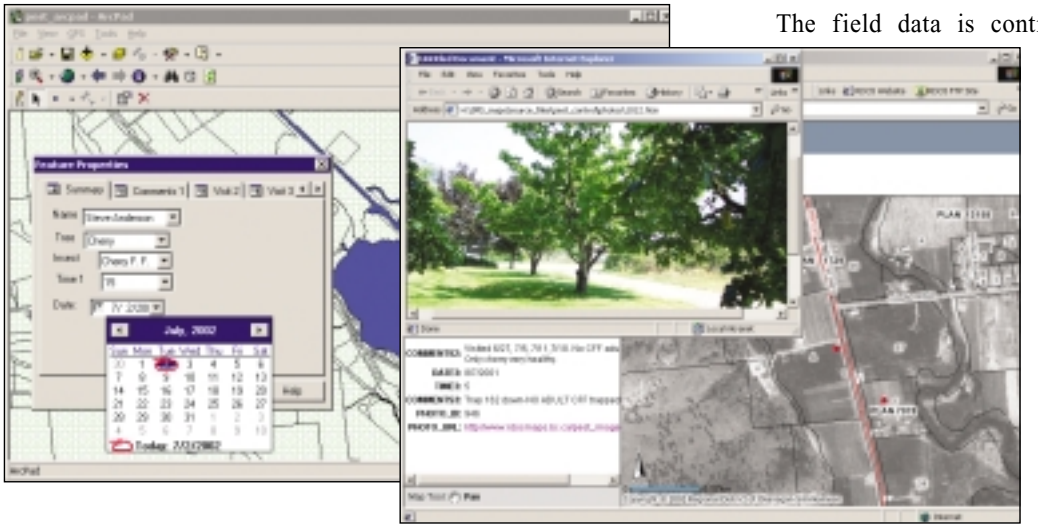
RDOS staff is responsible for following up on complaints of fruit tree pest infestations, informing property owners of their obligations under the Bylaw, and ensuring their compliance.

In the spring of 2001, the Public Works Department requested that reports of infested areas be tracked and recorded. An ArcPad application, including a custom form with a calendar and pull-down lists, was created and loaded onto an iPAQ handheld device to allow staff to map problem areas and attach comments about the infestation while out in the field. The RDOS parcel base for the area of interest, including all civic and ownership information (9,100 parcels), along with the stream and road line work, was added to ArcPad for reference.

"Once the field technician has determined that there is an infestation, he marks the location using the ArcPad application and adds information regarding the infestation such as fruit tree species affected, insect pest, date, and comments about the severity of the infestation," said Mr. Bouwmeester.

Next, the technician contacts the owner to discuss the problem and review possible solutions. The technician returns to the site at least one more time to ensure that some control action has taken place and records the date and comments on actions taken and results of the actions. The field technician also takes a digital photo of the site and records the photo ID in the appropriate field so that the photo can later be linked with the particular location.

The field data is continually added to the GIS database and in turn the ArcIMS application is updated with the new data so staff can see where the current pest problems are located and view the status of the problem. They can also click on the 'Photo' field and view an image of the infested area on the screen.

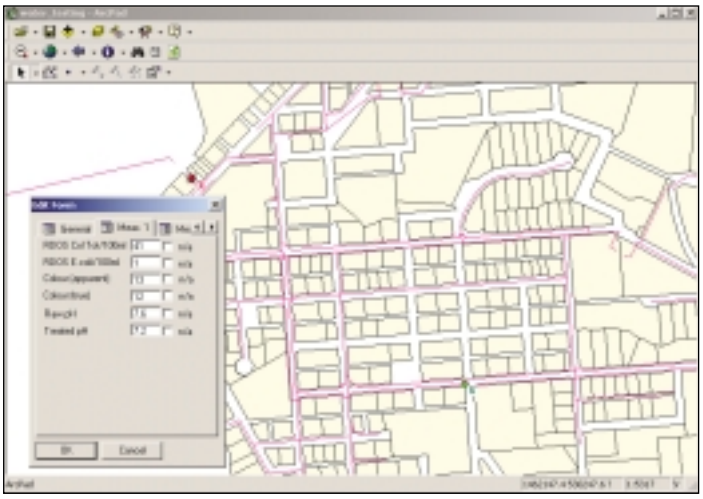


The RDOS developed an ArcPad application to track fruit tree pest control and has integrated the data collected in the field into an ArcIMS application.

The second pest control program maintained at RDOS is the mosquito control program. In this program technicians check stagnant water bodies for mosquito larvae and predators that eat the larvae, and apply larval sprays where required.

Using an ArcPad application on an iPAQ handheld device, the technicians indicate on a map where the sprays have been applied and record comments for each location including the type of site (flooded field, pond, riparian, etc.). This data is also periodically downloaded and added to the GIS database. It can then be promptly displayed through ArcIMS, permitting staff to quickly and easily obtain details about the locations where the mosquito control program has been applied.

"The biggest advantage to collecting the data using ArcPad for both of these programs is that our ArcIMS applications can easily be updated with the latest information on a regular basis, so that staff in the office and board members can access details about the infestations and the sprays in a more timely manner, rather than waiting for the end of the field season when the technician writes a report," said Mr. Bouwmeester.



An ArcPad application is used to track water sample testing results for locations throughout the RDOS.

Water Sampling with ArcPad

In addition to pest control, the RDOS is also responsible for the supply, treatment, and delivery of potable water for four water service areas in the region. Weekly water samples are taken at numerous set locations throughout the water system. The samples are tested for a variety of water parameters including temperature, turbidity, pH, E.coli, and fecal coliform.

In early 2002, an ArcPad application was developed to allow Public Works staff to input the results of these tests for each individual location into a custom form, while in the field. The technician can then download the data to a local computer and use a VBA application to import the values collected using ArcPad into an Microsoft Access database and append the new data to a table with data for the entire year. Graphs of the various water parameters can be generated for each location to show changes in the data over time. These graphs are distributed in a monthly report that is available to the public.

Later this year a static map of the water system will be posted on the public website. This map will display the general sampling locations and allow users to click on a location and choose to see one of the several graphs about the water samples.

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Tim Bouwmeester, GIS Coordinator, RDOS

Moving Forward

In addition to the water sampling application, RDOS is working on two more water applications. The first, a water valve and maintenance application, was created to record maintenance information for the valves and hydrants in the water systems. When a technician completes an inspection and/or maintenance for a valve or hydrant, it is located and selected using ArcPad, and the date, type of service preformed, parts replaced, and any remarks are entered on a custom form. An ArcIMS application will soon be developed to show all of the water systems and allow users to perform a query to select all hydrants and valves that have not been maintained for a given time period (i.e. six months). Staff can then generate a report showing the selected records and provide it to the technicians in the field.

A second new ArcPad application will help RDOS collect connection information for the water mains in the region including location, type of connection (domestic or irrigation), connection diameter, and pipe material. This data will be loaded into the GIS database and used to create a geometric network. Staff will then be able to notify owners affected by maintenance or other issues related to the water system in their area.

The RDOS is also planning to establish a public ArcIMS website in 2002 to display cadastral, civic, land use, and several other GIS datasets. This site will allow the public to search for a specific parcel, based on civic address and/or assessment roll number, and find legal information, assessment values, tax code, and land use information. They will also be able to create simple maps to display the cadastral base with civic or legal information.

"We are extremely pleased with these custom applications created using ArcPad," concluded Mr. Bouwmeester. "We built user-friendly applications with drop-down menus and calendars in a short period of time, and since data now is input using a standard format and only set values can be chosen for certain fields, the result is very clean field data for our ArcIMS applications."

RDOS is taking advantage of the interoperability of many of the ArcGIS tools and, as a result, has been able to display and share results from the field with office staff in a timely manner. As more staff are introduced to the capabilities of the existing applications, the demand for new applications is sure to increase and the benefits of GIS will be realized by more departments throughout the organization in the coming years.

RDOS - www.rdos.bc.ca