

# DISTRICT of NORTH VANCOUVER

## SATELLITE IMAGERY

Located against the backdrop of BC's Coast Mountains, the District of North Vancouver is home to over 80,000 citizens who work and live in B.C.'s lower mainland. The diverse geography and undulating terrain make this large area a popular outdoor destination for many of Vancouver's residents. Making North Vancouver a liveable region requires many resources.

The local government has an advanced technological profile that allows digital tracking and change detection in habitat, environment, water quality, and commercial development. Recently, the benefits of satellite imagery and the field of remote sensing have opened a new world of understanding the community and its geography.



In 2000 and 2001, the District's GIS Department purchased imagery captured by the IKONOS satellite. IKONOS was the first commercial high-resolution imaging satellite, offering multispectral data with a resolution of 4-meters and black and white imagery of 1-meter. The Lockheed Martin-built IKONOS Satellite was launched on Sept. 24, 1999 from Vandenberg Air Force Base, California by Space Imaging of Denver, Colorado

The colour, or "multispectral" sensor onboard the IKONOS satellite captures images in four image bands. Similar to the human eye, the sensor records the red, green and blue wavelengths, but it also senses infrared (IR) information. Analyzing the infra-red bands is useful in identifying impervious surfaces, vegetation health, trees species, and man-made features, for example.



R,G,B Colour Image:  
Northlands Golf Course

After the completion of a pilot project, which was lead by two students from the British Columbia Institute of Technology (BCIT), the GIS Department funded an effort that involved processing the IKONOS imagery and preparing it for analysis. But rather than outsource the complex processing of the data the District's vision was to invest in the skills needed to

In October 2001 the District of North Vancouver GIS Department successfully orthorectified and enhanced the IKONOS satellite imagery. Once the IKONOS imagery was orthorectified, or "stretched and draped" over the digital elevation model, the imagery was then colour-balanced and mosaicked. Having first used IDRISI software to perform the processing tasks the GIS Department eventually migrated to PCI's GeoMatica suite of image processing tools.

The resulting product was a virtual warehouse of possibilities and through the process of site training and classification GIS Analysts could begin to interpret the satellite imagery and apply its uses to a wide variety of



IR Image: Northlands Golf Course

Classification of tree species, vegetation coverage, and land-use was immediately beneficial to the District's Forestry Management Program. Using the newly obtained raster satellite imagery along with a five-year spatial database of inspected trees allowed environmental analysts to identify areas of concern across the entire municipality.

Moreover, the satellite imagery not only provided a rich base for classification and identification of geographic features but it also lent itself to producing high-quality visualization products.

In 2002, the GIS Department created a variety of fly-through movies that allow the user to experience a "virtual flight" through the North Shore mountains, its rivers and the community. The movies can be viewed on *GeoWeb*, the District's GIS website, at [www.geoweb.dnv.org](http://www.geoweb.dnv.org). In addition, the use of 3D models derived from satellite imagery brings remote areas immediately to the desktop, thereby aiding planners and engineers to help shape our community.

As new satellites become operational greater imagery resolutions will offer even greater detail. The District of North Vancouver now annually acquires remotely sensed data and will in time develop a temporal database that can be used for long-term change detection. The move towards merging raster spatial data with vector data has leveraged the corporation's GIS to new levels by providing products for staff and the community alike.

### More Information

District of North Vancouver  
GIS Department  
355 West Queens Road,  
North Vancouver, B.C. Canada V7N 4N5  
(604) 990-2450



District of  
**NORTH VANCOUVER**  
*naturally beautiful*

<b>Population:</b>	Over 80,000
<b>Area:</b>	16,461 ha
<b>Number of Properties:</b>	Over 26,300
<b>Percentage of Parks</b>	62% Park Land
<b>Average Rainfall:</b>	260 - 270 cm
<b>Average Temperature:</b>	13°C
<b>Total Length of Road:</b>	453 km
<b>Length of Water Network:</b>	486 km
<b>Total Area of Sidewalks:</b>	278 ha

### 3D VISUALIZATION of NORTH VANCOUVER

