



# ITT

## Visual Information Solutions

## ENVI EX | Feature Extraction Workflow

Geospatial imagery is more than just a pretty picture or a backdrop to a map. Today, it is used to provide specific information about a geographic area of interest and can help you make decisions that are important in your line of work.

ENVI EX is the newest addition to the ENVI line of premier image processing and analysis software products. It provides user-friendly tools to read, explore, prepare, analyze, and share information extracted from all types of imagery. Designed specifically for GIS users and fully integrated with ESRI's ArcGIS® software, ENVI EX includes unique step-by-step workflows that walk you through previously complex image analysis tasks.

### What is Feature Extraction?

Feature extraction – the process of finding and extracting specific objects of interest from high-resolution satellite imagery based on the object's spatial, spectral, and texture characteristics – is an essential task for professionals across industries who use imagery for information. Many features can be identified and extracted from geospatial imagery such as vehicles, buildings, roads, coastlines, rivers, lakes, and fields. Once features are extracted, they can be used for many applications: in the military to find tanks or airstrips; in urban development to determine the extent of housing sprawl; or in local government to track highway assets.



### Feature Extraction in ENVI EX

Manually locating and digitizing features in an image is tedious and time-consuming, especially over large coverage areas. In addition, limited spectral content may make standard pixel-based extraction approaches inaccurate. Now, the automated workflow in ENVI EX guides you through each step of the feature extraction process with intuitive dialog boxes and preset parameters based on typical desired outcomes. And, the process works with panchromatic, hyperspectral, and multispectral imagery, allowing you to use the data that is readily available to you.

The feature extraction workflow in ENVI EX allows you to easily extract features from an image. The tool automatically segments an image into regions of pixels by computing attributes for each region to create distinct objects, and classifies the objects to extract the features you want to analyze.

The ENVI EX feature extraction workflow allows you to quickly and accurately locate, extract, and identify features of interest in imagery. And, ENVI EX is flexible so you can modify parameters and data at any stage of the process, allowing you to get the specific information you need from your imagery and make more informed decisions.

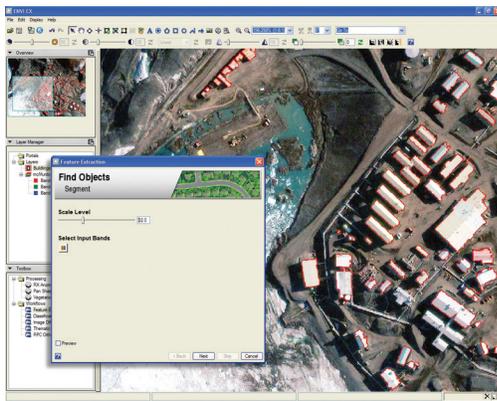
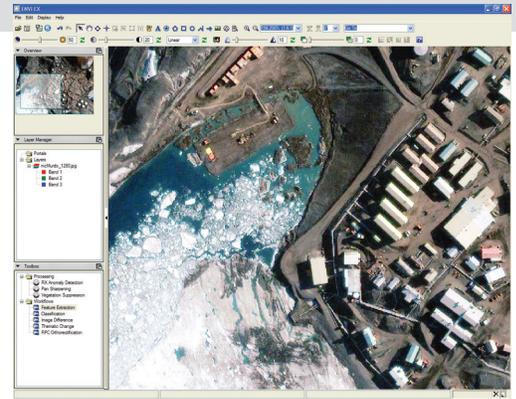
# Feature Extraction with ENVI EX

- **Select the Image You Want to Use**

Select an image from web or local search results, from ArcGIS, or from Windows® Explorer and simply drag and drop it into ENVI EX. ENVI EX supports today's most popular satellite and airborne sensors, and it can extract features from panchromatic, multispectral, and hyperspectral data.

- **Enhance Your Data**

If you have ancillary data about your image, such as a digital elevation model (DEM), you can import it into ENVI EX to provide additional criteria when segmenting and defining features. And, you can choose to confine image processing to specific areas of interest and reduce processing time.



- **Segment Your Image**

ENVI EX gives you the ability to extract a variety of features, depending on your specific needs and the imagery being analyzed. The feature extraction workflow guides you through the process of segmenting the image by dividing the image into discreet, real-world, objects through the identification of edges and the grouping of pixels into regions. A preview window provides immediate feedback on your segmentation without the need to process the entire dataset. This saves you time and provides the flexibility you need when experimenting with different results.

- **Classify the Segments into Features**

Following image segmentation, the workflow provides you with several options for defining the features that need to be extracted. You can choose example segments in the image that are representative of each

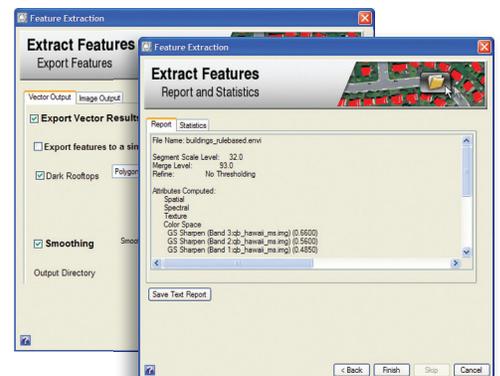
feature class or create rule sets that must be met in order to assign segments to a feature class. You can also apply existing GIS or field data to supplement the classification and help ensure the most accurate parameters.

- **Refine the Results**

Prior to final classification and extraction, the ENVI EX preview portal window allows you to view the preliminary results, so that you can make adjustments to the analysis before processing the entire image or example data. ENVI EX also provides tools to polish and refine your extraction results, obtain statistics, and assess accuracy so you can create a realistic final outcome. You can also choose to annotate results, count individual features, edit or smooth vectors, assess classification accuracy, and generate summary statistics about extracted features.

- **Share, Export, and Use Results**

ENVI EX allows you to share results at all stages of the workflow, use results for further analysis or for reports, or save the results. Results can be printed, included as part of a PowerPoint presentation, or saved to your computer, a geodatabase, or directly into an ArcGIS file. Additional analysis can also be done using ENVI EX or ArcGIS.



Unlock the information in your imagery. From reading and preparing, to exploring, analyzing, and sharing – you'll get information from imagery quickly and easily with the automated ENVI EX workflows. Learn more about ENVI EX at [www.itervis.com/ENVIEX](http://www.itervis.com/ENVIEX) or call 303.786.9900, and ask for your ENVI representative.