

Building the Irrigated Parcel to URF Zone relationships

Overview

To build relationships between the Irrigated Parcels and the URF Zones developed for the RGDSS StateMod model, Hydrosphere processed two ESRI shape files (in the UTM meters NAD27 Zone 13 projection), using ArcView 3.2, to generate a third file representing the intersection of the Parcels and URF Zones. The underlying .dbf file of this intersection shape file contained at least one record for each irrigated parcel, its corresponding URF Zone, and its acreage. If the parcel overlapped more than one URF Zone, a record was created for each URF Zone the parcel intersected with the acreage of the overlapping portion only. The resulting .dbf table was then processed in Microsoft Access to replace the one-to-many relationships with a one-to-one correspondence between the parcel's largest overlapping portion and the associated URF Zone.

Input data

Irrigated parcels input data

The irrigated parcels ESRI shape file (.shp, .shx, and .dbf files) we received required no manipulation or pre-processing.

URF Zones input data

The URF Zones shape file was incomplete when we received it. The topology of the coverage was unclear, as it contained many overlapping polygons, slivers, and polygons that were not closed. In addition, URF Zones bordering waterways on either side were merged, and the URF Zones representing buffer zones along the waterways were absent altogether.

To prepare this file for use, we first cleaned the existing topology using PC ArcInfo's build and clean utilities. Second, the merged URF Zones bordering waterways were split using the river coverage provided with the parcels and zones coverages. We then generated buffers along the same river lines and clipped them into the URF Zones map. The resulting Zones were then numbered uniquely and, where appropriate, associated with a river reach (buffer zones only).

Intersecting the Parcels and Zones and outputting the results

The non-automated method

ArcView 3.2 contains a new geoprocessing extension that automates the intersection of two shape files. It generates a third file with the intersected polygons and all the fields from both input files. This enables "quick and dirty" preparation of a parcel-to-zone relationships table for modeling. The calculation of a new acreage value for the intersected parcels must be done by hand, and then just the necessary fields (ParcelID, ZoneID, acreage) in the underlying .dbf file can be read into MS Access for post-processing.

Building the automation extension script

To make the intersection process easy to accomplish by those less familiar with ArcView, Hydrosphere built an ArcView extension too that fully automates the process from beginning to end. The extension prompts the user for the parcel and zone files, prompts for the ID fields in each input file, performs the intersection, calculates a new acreage for each resulting polygon, and creates a new shape file with just the ID and acreage fields. The .dbf file associated with the new shape file can be read into MS Access for post-processing.

To use this custom extension, the user needs only to copy the .avx file into their ArcView ext32 directory.