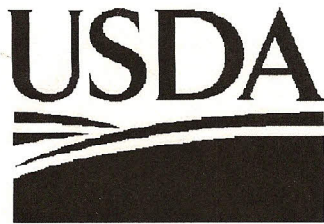


BIBKEY 7011



U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
Watershed Planning Services
Davis, California

Alhambra Creek Watershed – Phase II – GIS Development

' 5\$)7 FINAL REPORT

May 1999



USDA Natural Resources Conservation Service
Watershed Planning Services
430 G Street, #4164,
Davis, CA 95616-5475

**Alhambra Creek Watershed – Phase II – GIS Development
May 1999**

**Bill Cunningham, Biologist, Team Leader
Robyn Myers, Landscape Ecologist – GIS development**

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GIS Report and Recommendations

The Geographic Information System (GIS) data and metadata (information about the data) that was compiled for the Alhambra Creek Watershed represents the data that was available for the Alhambra Creek Watershed area of Contra Costa County in 1997-98. The data was located, purchased and processed so that digital map information from a variety of different sources could be viewed together. Because these data come from a variety of sources, their scale of resolution, accuracy of information, and the precision of conversion from paper to digital maps will vary. However, this does not prevent these data from being viewed or used together for analysis. It simply means that the source, scale and quality of the data needs to be considered when using it.

Development of a GIS data set for a particular land area or project usually requires several stages. In the case of the Alhambra Creek Watershed, the first stage was to conduct a Resource Inventory, which reviewed the resources in the watershed, their history, and currently available information (data) about them. The next stage was ...

What data you have

Summary table of Alhambra Creek Watershed GIS Metadata, recorded on the CERES Information Catalog database at http://ca.ceres.gov/catalog/bin/show_catalog?catalog=167. In addition to digital GIS data, some paper information products are listed in the CERES Metadata catalog for Alhambra Creek:

- Alhambra Creek Watershed Resource Inventory Report (1997)
- Paper Maps (Figure 1-7) from the Resource Inventory Report

Metadata Summary Table of Alahmbra Creek Watershed GIS Data

Coverage/ Shapefile	Description	Directory path	Scale of Data	Data Source (Original source)	Original Projection /Final	Area covered
alhambra.tif alhambra.tfw (DRG)	Alhambra DRG (digital raster graphic) file and header file	C:\geodata\alhambra\ DRGs\	1:24,000	Sure!Maps, Horizon Technologies (USGS)	UTM Zone 10 NAD 83 /same	Great Alhambra Creek Watershed Area
Benicia (dem)	Benicia DEM digital elevation model data (also includes hillshade and contours)	C:\geodata\alhambra\ GRIDDEMs\	1:24,000	NRCS (USGS)	UTM Zone 10 NAD 83 /same	Benicia 7 ½ minute quadrangle map
Benne (doq) Bennw Bensw Bense (ie:benne.bil benne.hdr)	Benicia digital orthoquad and header file-- in 4 quarter quads (NW, SW, NE, SE corners of 7 ½ minute quadrangle map)	C:\geodata\alhambra\ DOQs\	1:24,000 (in quarter quads)	NRCS (USGS)	UTM Zone 10 NAD 83 /same	Benicia 7 ½ minute quadrangle map
Bound.shp	Watershed boundary -- ACW Inventory	C:\geodata\alhambra\ shapefiles\	1:2000	NRCS Davis (Contra Costa Flood Control Map)	Unknown /UTM Zone 10 NAD 83	Alhambra Creek watershed
Brionval (dem)	Briones Valley DEM digital elevation model data	C:\geodata\alhambra\ GRIDDEMs\	1:24,000	NRCS (USGS)	UTM Zone 10 NAD 83 /same	Briones Valley 7 ½ minute quadrangle map
Bvne (doq) Bvnw Bvsw Bvse (ie:bvne.bil bvne.hdr)	Briones Valley digital orthoquad and header -- in 4 quarter quads (NW, SW, NE, SE corners of 7 ½ minute quadrangle map)	C:\geodata\alhambra\ DOQs\	1:24,000 (in quarter quads)	NRCS (USGS)	UTM Zone 10 NAD 83 /same	Briones Valley 7 ½ minute quadrangle map
Ccveg	Contra Costa vegetation	C:\geodata\alhambra\ ccutm\	1:250,000	Teale (USFS, CDF)	Albers Equal Area NAD 27 /UTM Zone 10 NAD 83	Contra Costa County
Febgpsu10.shp	February 1998 GPS data	C:\geodata\alhambra\ shapefiles\		Field collected by NRCS & CCRCD	Latitude- Longitude /UTM Zone NAD 83	Alhambra Creek Watershed area
Fireprot	Fire (CDF) areas of state responsibility	C:\geodata\alhambra\ ccutm\	1:24,000 1:62,500	Teale (CDF)	Albers Equal Area 27 /UTM Zone 10 NAD 83	Contra Costa County
Geonames	geographic names and locations	C:\geodata\alhambra\ ccutm\	Mostly 1:24,000	Teale (USGS Geographic Names Information Center)	Albers Equal Area 27 /UTM /UTM Zone 10 NAD 83	Contra Costa County
Govtown	land ownership	C:\geodata\alhambra\ ccutm\	1:100,000	Teale (BLM, CDF)	Albers Equal Area /UTM Zone 10	Contra Costa County
Grdwtr	ground water basins	C:\geodata\alhambra\ ccutm\	1:250,000	Teale (Ca DWR)	Albers Equal Area /UTM Zone 10	Contra Costa County
Hardwd	hardwoods	C:\geodata\alhambra\ ccutm\	1:24,000 1:58,000	Teale (CDF- FRAP)	Albers Equal Area /UTM Zone 10	Contra Costa County
Lu.shp	Land Use for watershed (ACW Inventory)	C:\geodata\alhambra\ shapefiles\	1:2000	NRCS Davis (Contra Costa Landuse Zoning map)	Unknown/ UTM Zone 10	Alhambra Creek watershed
Majrds	major roads (highways)	C:\geodata\alhambra\ ccutm\	1:100,000	Teale (USGS DLG)	Albers Equal Area NAD 27 /UTM Zone 10 NAD 83	Contra Costa County

Newveg.shp	Updated vegetation based on DOQ and veg.shp	C:\geodata\alhambra\shapefiles\	1:24,000	NRCS Davis (Based on DOQ and CDF/USFS veg maps)	UTM Zone 10 NAD 83 /same	Alhambra Creek watershed
Othrds	roads (local streets)	C:\geodata\alhambra\ccutm\	1:100,000	Teale (USGS DLG)	Albers Equal Area NAD 27 /UTM Zone 10 NAD 83	Contra Costa County
Range.shp	Range site description (ACW Inventory)	C:\geodata\alhambra\shapefiles	1:2000	NRCS Davis (Contra Costa Soil Survey 1977)	UTM Zone 10 NAD 27/ UTM Zone 10 NAD 83	Alhambra Creek watershed
Rrmisc	Railroad and miscellaneous transportation	C:\geodata\alhambra\ccutm\	1:100,000	Teale (USGS DLG)	Albers Equal Area NAD 27 /UTM Zone 10 NAD 83	Contra Costa County
Sactohyd Sfranhyd Sjosehyd Srosahyd	hydrography (xxjhysa) by 1:100,000 quads	C:\geodata\alhambra\ccutm\	1:100,000	Teale (USGS DLG)	Albers Equal Area /UTM Zone 10	Santa Rosa, Sacramento, San Francisco and San Jose 1:100,000 quads
Soil	Soils and erosion potential (ACW Inventory)	C:\geodata\alhambra\shapefiles	1:2000	NRCS Davis (NRCS Contra Coast Soil Survey)	UTM Zone 10 NAD 27 / UTM Zone 10 NAD 83	Alhambra Creek watershed
Veg.shp	Vegetation (ACW Inventory)	C:\geodata\alhambra\shapefiles	1:100,000	NRCS Davis (CDF Veg Cover and Hardwoods Range maps)	UTM Zone 10 NAD unknown/ UTM Zone 10 NAD 83	Alhambra Creek watershed
Vineh (dem)	Vinehill DEM digital elevation model data	C:\geodata\alhambra\GRIDDEMs	1:24,000	NRCS (USGS)	UTM Zone 10 NAD 83 / same	Vine Hill 7 ½ minute quadrangle map
Vhne (doq) Vhnw Vhse Vhsw (ie:vhne.bil vhne.hdr)	Vinehill digital orthoquad -- in 4 quarter quads (NW, SW, NE, SE corners of 7 ½ minute quadrangle map)	C:\geodata\alhambra\DOQs	1:24,000 (in quarter quads)	NRCS (USGS)	UTM Zone 10 NAD 83 / same	Vinehill 7 ½ minute quadrangle map
Walcr (dem)	Walnut Creek DEM digital elevation model data	C:\geodata\alhambra\GRIDDEMs	1:24,000	NRCS (USGS)	UTM Zone 10 NAD 83 / same	Walnut Creek 7 ½ minute quadrangle map
Wcne (doq) Wcnw Wcse Wcsw (ie:wcne.bil wcne.hdr)	Walnut Creek digital orthoquad - in 4 quarter quads (NW, SW, NE, SE corners of 7 ½ minute quadrangle map)	C:\geodata\alhambra\DOQs	1:24,000 (in quarter quads)	NRCS (USGS)	UTM Zone 10 NAD 83 / same	Walnut Creek 7 ½ minute quadrangle map

History of the dataset

This request for GIS database development followed the delivery of the Alhambra Creek Watershed Resources Inventory Report delivered in 1997. NRCS staff involved with the Inventory report used UNIX platform ARC/INFO GIS and UNIX and PC AutoCad to create the maps and map drawings included in the report. The Contra Costa RCD and Concord NRCS Service Center Field Office requested our further assistance to develop these same map data layers, as well as integrate all data that could be reasonably purchased or otherwise acquired for Contra Costa count and the Alhambra Creek watershed area.

This involved CCRCD purchasing data (delivered on CD rom) from the Teale Data center for Contra Costa County. It also involved retrieving the map data layers used in the inventory report from their archive tapes (which required some reconstruction of the data). CCRCD also purchased a CD rom from Horizon Technologies Sure!Maps containing 7.5 minute quadrangle digital raster graphics (DRGs) for Contra Costa county. NRCS had already purchased copies of the digital elevation models (DEMs) and Digital Orthoquadrangle quarter quads (DOQQs) for the four 7.5 minute quadrangle maps that cover the Alhambra Creek Watershed: Benicia, Vine Hill, Briones Valley, and Walnut Creek.

Based on recommendations from the UC Davis Information Center for the Environment (ICE), the best map projection for integrating data at the county level is UTM Zone 10, NAD 83. Data were purchased in whatever form they were available, and so if they were not delivered in UTM Zone 10, NAD 83, the data had to be converted to this projection and datum. Information on what processes were used to do this are included in the metadata for each data layer, recorded on the CERES California Information Data Catalog.

deliver via Iomega ZIP disk, and setup, complete GIS dataset on CCRCD computer
enter metadata for each datalayer on the CERES environmental
information catalog (to be maintained and updated in the future by
CCRCD) -- which is accessible via the WWW
update Alhambra Creek web site to reflect all these products and how
to get more information about them
prepare presentation for Watershed Group on Phase II work
prepare a final written report summarizing all these things and making
recommendations for future GIS efforts of the Watershed Group and CCRCD

The only thing that Nancy and I planned to do that was not completed was to create a data layer that locates the flooding survey photos and information by street address, because the street map data we received from the County (I believe that was where it came from) was corrupt. Jonathan scanned the photos, and created an Excel table of the survey data which he delivered to Nancy (and I do not have a copy of it). Nancy and I had planned to purchase a commercially available CD-ROM of Contra Costa street map data (from AAA or Thomas' guide etc...), if funds were available -- however, we were not able to do this before she left. If in the future you can purchase a Street map CD-ROM, Sue should be able to do the matching of the photos and excel table of survey responses to the street addresses within ArcView.

One exciting aspect of the GIS is the use of the DOQ (or DOQQs) as a basemap. The DOQs (digital ortho quads) for the four 7.5 minute quadrangles (Vine Hill, Benicia, Briones Valley and Walnut Creek) have great clarity down to one meter pixels -- meaning anything with an area of about 3 feet or great is visible. Within ArcView you can "zoom in" to see individual trees, cars on the freeway, and buildings. This level of detail is simply not visible on 9x9 air photos. These photos are from 1995 and may be used to update the vegetation, soils, range and other maps that were created for the original inventory. I have demonstrated this for Bill, who created the inventory maps from aerial photos and existing paper maps. While the original maps are accurate for the scale at which they were made, in the future (i.e. a Phase "III" request if you are requesting Bill and I to work on it) there is the potential for Bill or perhaps someone else from the Watershed group, working with Sue or me to do the on-screen digitizing, to update the inventory maps to the "next level of detail." Because this inevitably would be a very time consuming process, we should be sure that the Watershed Group would like or needs this level of detail for their planning efforts.

What you can do with it

Right now, with the current data in the data set, a variety of maps can be produced and analysis conducted. Different data layers can be visually laid on top of each to show relationships, and with PC or UNIX ArcInfo, or using the ArcView Geoprocessing extension, new data layers can be created by combining two (or more) overlapping or adjacent data layers together. For example ...

What you may want to do in the future

What data you will need in the future will depend on the kinds of maps you wish to produce and the questions you wish to ask of your data. Collecting new data for the watershed, of any kind, should be combined with GPS point data collection, so that the new data can be included. New data might include ...

New data are being developed all the time by other local, county, state and federal agencies. Many of these datasets are available free for download. Others may need to be purchased. For example, the digital version of the Contra Costa Soil Survey is now available for download at http://www.ftw.nrcs.usda.gov/ssur_data.html. These data will be added to the data set upon delivery. Other examples might be ...

HOW TO USE THIS DATA SET

The Alhambra Creek watershed is located near the town of Martinez in Contra Costa County, California. In 1998 an integrated GIS database was compiled for the Alhambra Creek watershed from all the existing data that was available. These data, from a variety of sources, are being imported into the PC ArcView GIS environment, using the UTM Zone 10 projection. More information about this project can be found at <http://www.ca.nrcs.usda.gov/wps/alhambra.html>.

Contra Coast County Data (Teale Data Center)

County wide data coverages were available from the Teale Data Center in the Albers Equal Area projection (with the "Teale Shift"). Further information and metadata about Teale Data may be found at <http://www.gislab.teale.ca.gov>.

USGS Data (UTM Zone 10)

USGS 7.5 minute quadrangle maps, digital elevation models and digital ortho quarter quadrangles were available for the area in the UTM Zone 10 projection. For further information and metadata, please see <http://mapping.usgs.gov/www/products/status.html>. Four USGS 7.5 minute quadrangle maps cover the watershed:

- Benicia
- Briones Valley
- Vinehill
- Walnut Creek

NRCS Resource Inventory Data and February 1998 Flood Data (UTM Zone 10)

GIS data for the area was created, collected and compiled by the USDA NRCS California State office beginning in 1996, from both paper and digital map sources. In 1997 the "Alhambra Creek Watershed Resources Inventory" report was completed that included maps created with this data. In February 1998 GPS flood data were collected by for high water debris marks in Martinez, along with photographs. These data were imported as a coverage that displays a photograph for each location.

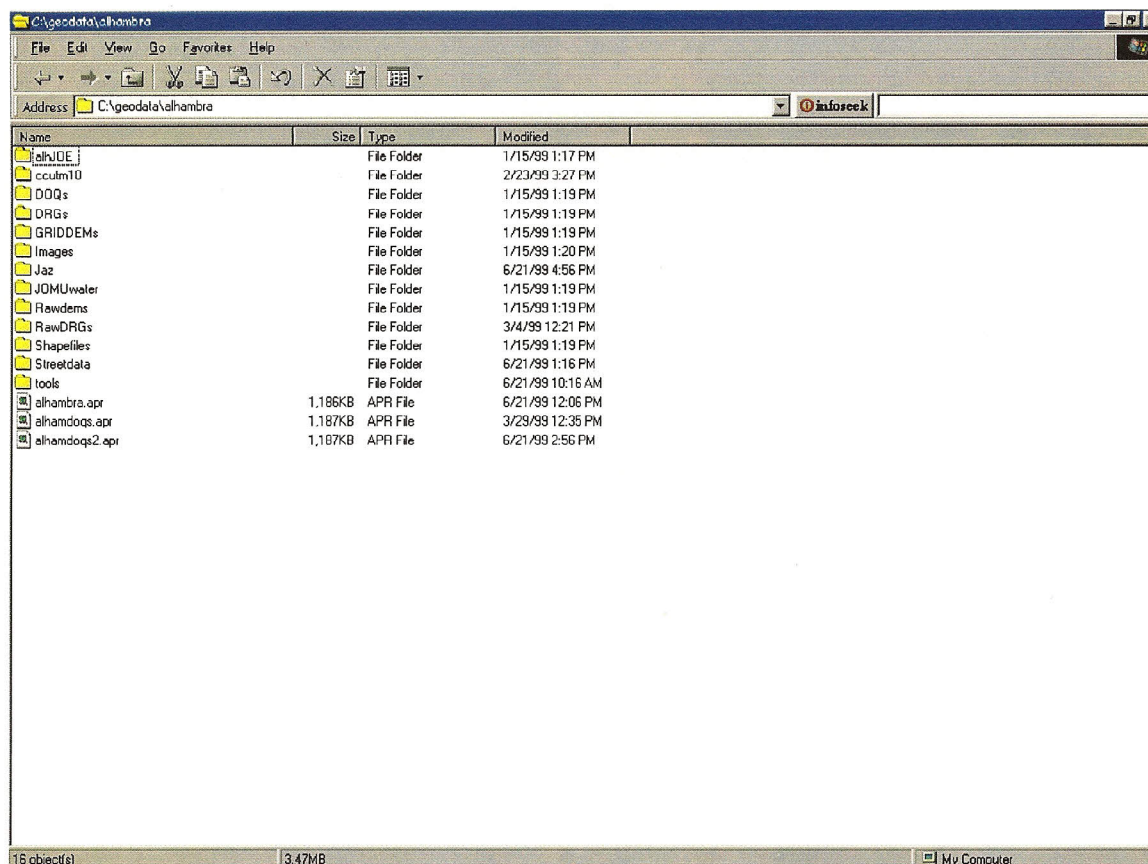
Metadata on CERES Environmental Information Catalog

Metadata for all the data, reports and maps created for this project can be found at <http://ceres.ca.gov/catalog/>. Select the "Alhambra Creek Watershed" catalog title.

GIS METADATA NOTEBOOK CONTENTS

- Alhambra Creek Watershed Metadata
- NRCS 1997 Inventory Maps
- Teale Contra Costa County Data
- Alhambra DOQs
- Alhambra DEMs
- February 1998 Flood GPS Data
- Contra Costa County Martinez City Maps Data
- John Muir National Historic Site Stream Data (original returned to Phylis Shaw)

DATA AND METADATA SUMMARY – TECHNICAL SETUP



What you need to open "Alhambra.apr":

ArcView 3.1

ideally, load on C:/esri/av_gis/arcview

Extensions: Spatial Analyst

CD with DOQs for "core" watershed area

-BENW, BENE, BVNE, BVSE, VHSW, WCNW, WCSW

C:/geodata/alhambra

ccutm10

shapefiles

DRGs

GRIDDEMs

Existing copies of the Alhambra Creek GIS dataset:

WPS GIS computer - C:/geodata/alhambra
WPS Portable copy - J:/geodata/alhambra (2 GB Jaz disk)
CCRC computer - C:/geodata/alhambra
CCRC office, Iomega Zip disks and CD rom - 4 Iomega Zip disks plus 1 CD rom
- these copies are archive copies, and should be copied from the Zip disks to a hard drive with the following directory structure: C:/geodata/alhambra
NPS (Rick Inglis) - 1 GB Jaz disk copy of dataset with "core" DOQs

Directory Structure:

C:/geodata/alhambra/

Subdirectories:

AlhJOE - 1997 Resource Inventory data originally from UNIX Arc/Info

CCUTM10 -- Contra Costa County data (from Teale) in UTM Zone10

DOQs -- DOQs and headers (may just be headers when used with CDs)

DRGs -- SureMaps! tiled digital raster graphics of 7.5 minute quads

GRIDDEMs -- DEMs, with derived contours, hillshade etc...

Images -- slides and scanned photos

Jaz -- "J:/ versions" of the APR files for use with JAZ disks

JOMUwater -- John Muir Natl Historic Site water study data

Rawdems -- Individual DEMs (original)

RawDRGs -- Individual DRGs with white borders (not tiled)

Shapefiles -- Shapefiles for Teale coverages, Inventory coverages etc...

Streetdata -- Martinez street data from County (Autocad format?)

Tools -- projection files, DOQ header utility

Alhambra.apr -- Primary APR file for use with C:/geodata/alhambra directory sturcture*

Alhamdoq.apr -- Similar project focusing on DOQs

(*version for use with Jaz drive defined as "J" in the Jaz directory. If JAZ drive NOT defined as "J" -- open *.apr file in text editor and search for J:/ and replace with the Jaz drive letter */)

