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Division of Agriculture and Natural Resources
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NRCS Natural Resources Conservation Service
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Farm Water Quality Planning

A Water Quality and Technical Assistance Program for California Agriculture
http://waterquality.ucanr.org

This REFERENCE SHEET is part of the **Farm Water Quality Planning (FWQP)** series, developed for a short course that provides training for growers of irrigated crops who are interested in implementing water quality protection practices. The short course teaches the basic concepts of watersheds, nonpoint source pollution (NPS), self-assessment techniques, and evaluation techniques. Management goals and practices are presented for a variety of cropping systems.

UC PEER REVIEWED

Reference:

Farm Maps

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Although farm maps can be as simple as hand sketches, they generally are more elaborate, drawing their information from topographic maps, aerial photographs, soil survey maps, and Geographic Information Systems (GIS) technologies. Notes or drawings added to maps and photographs can provide important site-specific information. Aerial photographs are useful in identifying changes over time.

TOPOGRAPHIC MAPS

The United States Geological Survey (USGS) has prepared topographical maps for most areas in the United States. These maps illustrate geographic features of the landscape such as hills, valleys, and streams. They come in two sizes: the 15 minute (1:62,000) and 7.5 minute (1:24,000) series. A 15 minute series map covers an area of about 230 square miles. The 7.5 minute maps are printed on the same sized sheet as the 15 minute maps, but because four 7.5 minute maps cover the same geographical area as a single 15 minute map, the 7.5 minute maps show much more detail.

Topographic maps are available from the US Geologic Survey:

Earth Science Information Center
USDA – U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025
Telephone: (650) 329-4390
http://www.usgs.gov
http://topomaps.usgs.gov/ordering_maps.html

USGS topographic maps can also be purchased at outdoor recreation or sporting goods stores and stores that specialize in maps. Look in the yellow pages under maps. The Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service) office has USGS topographic maps and may be able to provide photocopies.

AERIAL PHOTOGRAPHS

Aerial photographs make an excellent base map for farm and ranch planning. For some sites, old aerial photographs can be obtained and used with newer photographs to identify changes over time. Two sources where aerial photographs usually are available are the local Farm Services Agency (FSA) and WAC Corporation in Eugene, Oregon.

Aerial photographs can be ordered in two different forms and can be enlarged to different sizes. You can have them printed on photographic paper (so they look like regular black and white photographs) or on Mylar. The Mylar version is a type of film positive, an opaque image printed onto a transparent sheet. You can have 'blackline' prints produced from Mylar prints at a blueprint shop. The blackline prints are not as crisp as regular photographic prints, but they are inexpensive (generally $1.00 each) and you can make many copies from a single Mylar print. The initial cost of a Mylar print is approximately $5 to $10 more than a print on photographic paper.

Besides allowing you to create cheap blackline prints, Mylar has the further advantage that you can write on it using erasable ink and then duplicate your map with appropriate notes. The advantage of a photographic paper print is that the image is more crisp and slightly easier to read, but there is no good, inexpensive method for reproducing additional copies. If you add notes to a photographic paper print, use erasable ink or tracing paper overlays.

Aerial photograph originals are taken at a scale of 1" = 3,333' (FSA) and 1" = 2,640' (WAC). These scales are calculated on the basis of average flight elevations, so they are not exact. Commonly used scales for enlargements are 1" = 500' and 1" = 660'. Photographs can usually be enlarged to 1" = 200', though they lose clarity at this scale. At a scale of 1" = 660', one square inch is equal to 10 acres.

In some instances, a specific range or site may appear in part on two maps. For such sites, you can make a special request to combine the maps.

Orders from USDA are filled in 3 to 4 weeks. The standard-sized print is 2' x 2'. At a scale of 1" = 660', this size of print would cover 5,760 acres. Cost in 2002 was $40 for a Mylar film positive and $16 for a black and white photographic paper print.

To order from WAC, send a FAX of a USGS topographic map with the property outlined and specify the scale and type of print (Mylar or photographic paper) that you want. Orders are filled in about a week. Aerial photograph prices are based on the size of the enlargement. Minimum orders in 2002 were $60 for Mylar or photographic paper. Optional 2-day shipping and handling costs an additional $12. Coverage for a 500 acre ranch at a scale of 1" = 500' should be within these minimum prices.

To order from USDA FSA, contact

USDA FSA APFO Sales Branch
2222 West 2300 South
Salt Lake City, UT 84119-2020
Telephone: (801) 975-3503
TDD: (801) 975-3502
FAX: (801) 975-3532
http://www.apfo.usda.gov/orderingimagery.html

To order from WAC, contact

WAC Corporation
520 Conger Street
Eugene, Oregon 97402-2795
Telephone: (800) 845-8088
FAX: (541) 485-1258
http://www.waccorp.com

SOIL SURVEY MAPS

Soil surveys, including maps, are available from the USDA Natural Resources Conservation Service. Modern soil surveys are aerial photos with soil mapping units superimposed. The soil survey includes soils descriptions and management information.

Soil survey maps, in addition to aerial photographs, wetland maps, and coastal zone maps, can be obtained from the USDA-NRCS. Find a local number in your phone book under U.S. Government Offices, or point your Web browser to
http://www.nrcs.usda.gov

GIS MAPS

A Geographic Information System (GIS) is a combination of computer software, hardware, data, and personnel designed to support the collection, manipulation, analysis, modeling, and display of spatially related data. Using GIS, a map maker can link layers of data to map features in a database that you can query to visually reveal relationships, patterns, and trends.

The advantage of GIS is that your map can include overlays for features such as soils, topography, streams, and plant communities. The disadvantage is that you may require the services of a knowledgeable consultant in order to use GIS technology.

To find general information about GIS and links to GIS Web sites, point your Web browser to the California Polytechnic State University (Cal Poly) at this URL:
http://www.lib.calpoly.edu/research/all_databases/gis/gis.html

For specific information about your watershed, click the California link on that Web page.

To query a GIS database that includes natural resource information provided by several California agencies and then create an interactive map, point your Web browser to this site at UC Davis:
http://ice.ucdavis.edu

ADDITIONAL MAP SOURCES

For Topographic Maps (Quad sheets), National Wetland Inventory Maps, and Aerial Photographs:

USDA – U.S. Geological Survey
Western Distribution Branch
P.O. Box 25286
Denver, CO 80225
Telephone: (800) 435-7627
Fax: (303) 202-4693
http://www.usgs.gov

For Topographic Maps and Geologic Maps and Reports:

USDA – U.S. Geological Survey
Western Mapping Center
345 Middlefield Road
Menlo Park, CA 94025
Telephone: (650) 329- 4309
Fax: (303) 202-4188
http://www.usgs.gov

For Geologic Maps and Reports:

California Department of Conservation
Division of Mines and Geology
107 S. Broadway, Room 1065
Los Angeles, CA 90012
Telephone: (213) 620-3560
Fax: (213) 620-3691
http://www.consrv.ca.gov

REFERENCES

Rangeland Watershed Program Fact Sheet No. 32, Ranch Maps (no author). July 1996. Information prepared and edited by John Harper (County Director and Livestock and Natural Resources Advisor, Mendocino County), Melvin George (Range and Pasture Specialist, Agronomy and Range Science, UC Davis), and Kenneth W. Tate (CE Rangeland Watershed Specialist, UC Davis).

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FOR MORE INFORMATION

You'll find detailed information on many aspects of field crop production and resource conservation in these titles and in other publications, slide sets, CD ROMs, and videos from UC ANR:

Nutrients and Water Quality, slide set 90/104
Protecting Groundwater Quality in Citrus Production, publication 21521
Sediments and Water Quality, slide set 91/102

To order these products, visit our online catalog at http://anrcatalog.ucdavis.edu. You can also place orders by mail, phone, or fax, or request a printed catalog of publications, slide sets, CD ROMs, and videos from

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