

CALIFORNIA

OCCUPATIONAL GUIDES

GEOGRAPHIC INFORMATION SYSTEMS SPECIALIST

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INTEREST AREA
PROFESSIONAL AND MANAGERIAL



WHAT DOES A GEOGRAPHIC INFORMATION SYSTEM (GIS) SPECIALIST DO?

GEOGRAPHIC INFORMATION SYSTEMS (GIS) SPECIALISTS work with related software and programs to create and maintain data and/or maps that can be combined with geographically referenced data. GIS software has the capacity to relate different types of data such as socioeconomic, demographic, administrative or political boundaries, land use, land cover, environmental, infrastructure, and transportation networks.

GIS Specialists perform the following tasks:

- Create maps and graphs, using GIS software and related equipment.

- Meet with users to define data needs, project requirements, required outputs, or to develop applications.
- Conduct research to locate and obtain existing databases.
- Gather, analyze, and integrate spatial data from staff and determine how best the information can be displayed using GIS.
- Compile geographic data from a variety of sources including censuses, field observation, satellite imagery, aerial photographs, and existing maps.
- Analyze spatial data for geographic statistics to incorporate into documents and reports.
- Design and update database, applying additional knowledge of spatial feature representations.
- Enter new map data through use of a digitizer or by direct input of coordinate information using the principles of cartography including coordinate systems, longitude, latitude, elevation, topography, and map scales.
- Analyze geographic relationships among varying types of data.
- Prepare metadata and other documentation.
- Operate and maintain GIS system hardware, software, plotter, digitizer, color printer, and video camera.
- Move, copy, delete, and add files, drawings, and maps to output reports in hard copy or electronic transfer.
- Present information to users and answer questions.
- Retrieve stored maps.

WHAT SKILLS ARE IMPORTANT?

GIS Specialists possess the following skills, knowledge, and abilities:

- Geography – Knowledge of various methods for describing the location and distribution of land, sea, and air masses

including their physical locations, relationships, and characteristics.

- Communication, Written, Oral, and Cartographic – The ability to convey GIS/spatial information to non-GIS/technical people.
- Analytical Skills – The ability to solve problems using the GIS suite of tools.
- Mathematics – Using mathematics to solve problems.
- Information Gathering – Knowing how to find information and identify essential information, and validate the information.
- Information Ordering – The ability to correctly follow a given rule or set of rules in order to arrange things or actions in a certain order.
- Computer Science – Using and developing computer programs to solve problems.
- Systems Evaluation – Looking at many indicators of system performance, taking into account their accuracy.

WHAT'S THE WORK ENVIRONMENT?

GIS Specialists usually work in clean, well lit, and well-ventilated offices. They generally work in their own cubicle equipped with computers and automated mapping equipment. The work often involves long hours in front of a computer screen using a keyboard and a mouse. Some GIS professionals do fieldwork to collect data.

Union Membership

Union membership depends upon the employment setting. Some government and utility company employees belong to public employee unions.

WHAT'S THE CALIFORNIA JOB OUTLOOK?

The following information is from the occupational projections produced by the Employment Development Department's Labor Market Information Division.

GIS Specialists are part of the Database Administrator occupational group, and this outlook

information applies to the whole occupational group not just the GIS Specialists:

Estimated number of workers in 1998:	12,300
Estimated number of workers in 2008:	20,500
Projected Growth 1998-2008:	66.7%
Est. openings due to separations by 2008:	2,700

These figures do not include self-employment.

Trends

Use of GIS continues to increase, but may not boost employment of GIS Specialists. Rather, it may lead to the addition of GIS duties to other occupations such as drafters, cartographers, and research analysts. Most GIS work is now done on personal computers whose increased speed and storage, relative low cost, and ease of use motivated GIS vendors to develop simpler GIS software.

Local governments face great challenges in providing transportation, health, employment, welfare, education, and infrastructure management to an ever-growing population. Since most of the decisions they make are related to location, geographic information is one of the most important and valuable factors in the areas of planning, public safety, urban renewal, and economic development issues facing local governments. Business also finds GIS an indispensable tool for marketing, location, and distribution decisions.

WHAT DOES THE JOB PAY?

California Earnings

Wages for Geographic Information Systems Specialists represent the broad occupational group Database Administrators.

Database Administrators 2001 Wages

Hourly wages range from	\$20.20	to	\$39.26
Average hourly wage	\$29.97		
Average annual wage	\$62,345		

Source: Occupational Employment Survey of Employers by EDD/LMID.

Hours

GIS Specialists generally work 40 hours a week. Longer hours and workweeks are not uncommon.

Benefits

Those GIS Specialists who work for governmental agencies and utilities enjoy a full range of benefits including health, vision, dental care, vacation, and sick leave. Benefits from other employers will vary.

HOW DO I PREPARE FOR THE JOB?

Education and Training

Those who wish to acquire GIS skills should pursue a GIS certificate program or obtain a Bachelor of Science degree in geography emphasizing GIS. There are a number of colleges and universities in California with certificate programs in GIS, including San Diego State University, American River Community College in Sacramento, Columbia College in Sonora, and the University of California at Riverside and Santa Barbara. GIS in combination with a major or minor, such as business, sociology, political science, or economics that emphasize analyzing data is a valuable education mix. Distance learning courses in GIS are also available over the Internet.

Licensing and Certification

California does not require licensing or certification for GIS Specialists. Employment and advancement opportunities may be enhanced for those who obtain certification through the professional associations listed in the Other Sources of Information section.

Continuing Education

It is important for GIS Specialists to keep up with new technology and practices in the field through extension courses and professional association seminars.

HOW DO I FIND THE JOB?

The majority of GIS Specialists work for government agencies or utility companies. Some GIS Specialists work as consultants and technicians to businesses that help private firms and public entities select the best hardware and software for their geographic information needs.

Direct application to employers remains one of the most effective job search methods. Private firms are listed in the yellow pages under Computer Graphics and Digital Imaging, Map Dealers and Services, and Marketing Research and Analysis. California job openings can be found at various online job-listing systems including CalJOBSSM at www.caljobs.ca.gov or at America's Job Bank at www.ajb.dni.us.

For other occupational and wage information and a listing of the largest employers in any county, visit the Employment Development Department Labor Market Information Web page at www.calmis.ca.gov. Find further job search assistance from your nearest Job Service office www.edd.ca.gov/jsloc.htm or the closest One-Stop site listed on the California WorkNet site, www.sjtcc.ca.gov/sjtccweb/one-stop.

WHERE CAN THIS JOB LEAD?

GIS Specialists in larger organizations may advance to supervisory and manager positions. Others may choose to become self-employed as GIS consultants.

OTHER SOURCES OF INFORMATION

California Geographical Information Association (CGIA)
P. O. Box 914
Adelanto, CA 92301-9998
www.cgia.org

American Society for Photogrammetry and Remote Sensing (ASPRS)
The Imaging and Geospatial Information Society
5410 Grosvenor Lane, Suite 210
Bethesda, MD 20814-2160
(301) 493-0290
www.asprs.org

Association of American Geographers
 1710 Sixteenth Street, NW
 Washington, D.C. 20009-3198
 (202) 234-1450
www.aag.org

University Consortium for Geographic Information
 Science (UCGIS)
 43351 Spinks Ferry Road
 Leesburg, VA 20176-5631
 (888) 850-8533
www.ucgis.org

Urban and Regional Information Systems
 Association
 1460 Renaissance Drive, Suite 305
 Park Ridge, IL 60068
 (847) 824-6300
www.urisa.org

Employment Projections by Occupation
www.calmis.ca.gov/htmlfile/subject/occproj.htm

Employment and Wages by Occupation
[www.calmis.ca.gov/file/occup\\$/OES\\$.htm](http://www.calmis.ca.gov/file/occup$/OES$.htm)

RELATED OCCUPATIONAL GUIDES

Computer Programmers	No. 81
Surveyors	No. 106
Drafting Occupations	No. 338
Cartographers (Map Makers)	No. 517
Computer Systems Analysts	No. 541

OCCUPATIONAL CODE REFERENCES

SOC (*Standard Occupational Classification*)
 Database Administrators 15-1061

O*NET (*Occupational Information Network*)
 Database Administrators 15-1061.00

OES (*Occupational Employment Statistics*)
 Database Administrators 25103

DOT (*Dictionary of Occupational Titles*)
 Drafter, Cartographic 018.261-010
 Photogrammetrist 018.261-026
 Stereo-Plotter Operator 018.281-010
 Database Administrator 039.162-010
 Database Design Analyst 039.162-014
 Information Scientist 109.067-010