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Socio-Economic-Environmental-Demographic Information System

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SEEDIS

SOCIO-
ECONOMIC-
ENVIRONMENTAL-
DEMOGRAPHIC

INFORMATION
SYSTEM

The LBL GEOGRAPHIC BASE FILE INVENTORY

and CARTE THEMATIC MAPPING SYSTEM

DISCLAIMER

SEEDIS

The Lawrence Berkeley Laboratory SEEDIS consists of a set of program modules for retrieving, analyzing, and displaying selected portions of a very large database used for environmental impact studies, health and pollution relationships, energy policy analysis, and labor force assessment [1-4].

SEEDIS features a user-friendly interface to the complex data management, analysis and display modules and additionally shields the user from the complex job control language of the computer system.

The SEEDIS MONITOR [5] is an executive program which provides straightforward access to SEEDIS tools and data, as well as "help" facilities, a local computer mail system, and an option to provide comments to the system designers. A menu format guides the user through selection of a geographic study area, specification of data to be extracted from the large integrated database, data entry [6], analysis and display modules.

The AREA MODULE

Before the mapping session begins, the Geographic Base File (GBF) is selected in the AREA module of SEEDIS. In addition to normal political divisions, the module is very generalized to allow the inclusion of administrative districts, such as prime sponsors or congressional districts.

The GBF inventory resides in the AREA module. GBF files purchased from outside sources or digitized on-site are added to the inventory on a project "need" basis. A majority of the files used in project applications at LBL are aggregations or modifications of existing files. There is a surprising small number of unique boundary file tapes; LBL has nine such tapes that have generated approximately forty-five percent of the inventory total. The county boundary file has generated the remaining sixty-five percent, about sixty GBF files.

In addition to the standard county/state boundary file, other tapes include

Population Centroids File
1970 Census Places

Med-X File
Sub-county Areas

Urban Atlas File
1970 SMSA Census Tracts

Air Quality Monitoring Stations File

Watershed Boundary File

Congressional Districts Boundary File

LBL File/EPA Place Locations File

World Data Bank I and II

The DATA MODULE

The Data Selection module provides on-line browsing and data item selection for all SEEDIS data bases. The inventory at LBL includes spatial data on approximately 150 energy, environmental, socio-economic, demographic and health data files [7].

An alternative data specification interface is the Subject module which satisfies the need for a subject oriented search facility for the vast number of data elements available in SEEDIS. Subject supports a tree structured representation of the data elements. By means of simple menu selection inputs, the user proceeds from more general to more specific data specifications.

When available, LBL will acquire the complete 1980 census. Preparations are already underway to produce specialized reports, many with choropleth mapping and chart graphics.

COMPUTER MAPPING PROJECTS

Environmental Impact Study Maps

An early LBL study produced a series of maps for the US Army Corps of Engineers, showing selected socio-economic-demographic data for SMSA's from five states and combined county corridor areas bordering the upper Mississippi and Illinois rivers.

SMSA Urban Atlases

One of the more widely known set of atlases was produced by a joint effort of LBL, the Bureau of the Census and the Department of Labor. A series of 65 atlases, one for each of the largest US urban areas, portrayed selected 1970 census characteristics by census tract. At LBL, the CARTE Mapping System was used to generate the initial maps as output on film which eventually became the color separation negatives for the printing process. A highlight of this project was the first full scale digitization of all the 1970 census tract outlines.

The Endangered Species Act/Energetics Atlas

Color maps were prepared showing geographic ranges (by aggregated county) of endangered species by taxonomic groups (mammals, fish, etc). Also, an atlas showing natural resource production and use by county for the US. Both of these projects were a joint effort by LBL and Brookhaven National Laboratory [8,9].

The PAREP Project

More recently, studies into the relationship between cancer incidence and air pollutants, and patterns of US mortality for selected causes of death have produced colored maps to help in reporting associations between various components in the studies [10,11].

CANCER MORTALITY
RATE PER 100,000
WHITE MALES
1950-69

ABOVE		170
157	–	170
148	–	156
139	–	147
128	–	138
BELOW		128
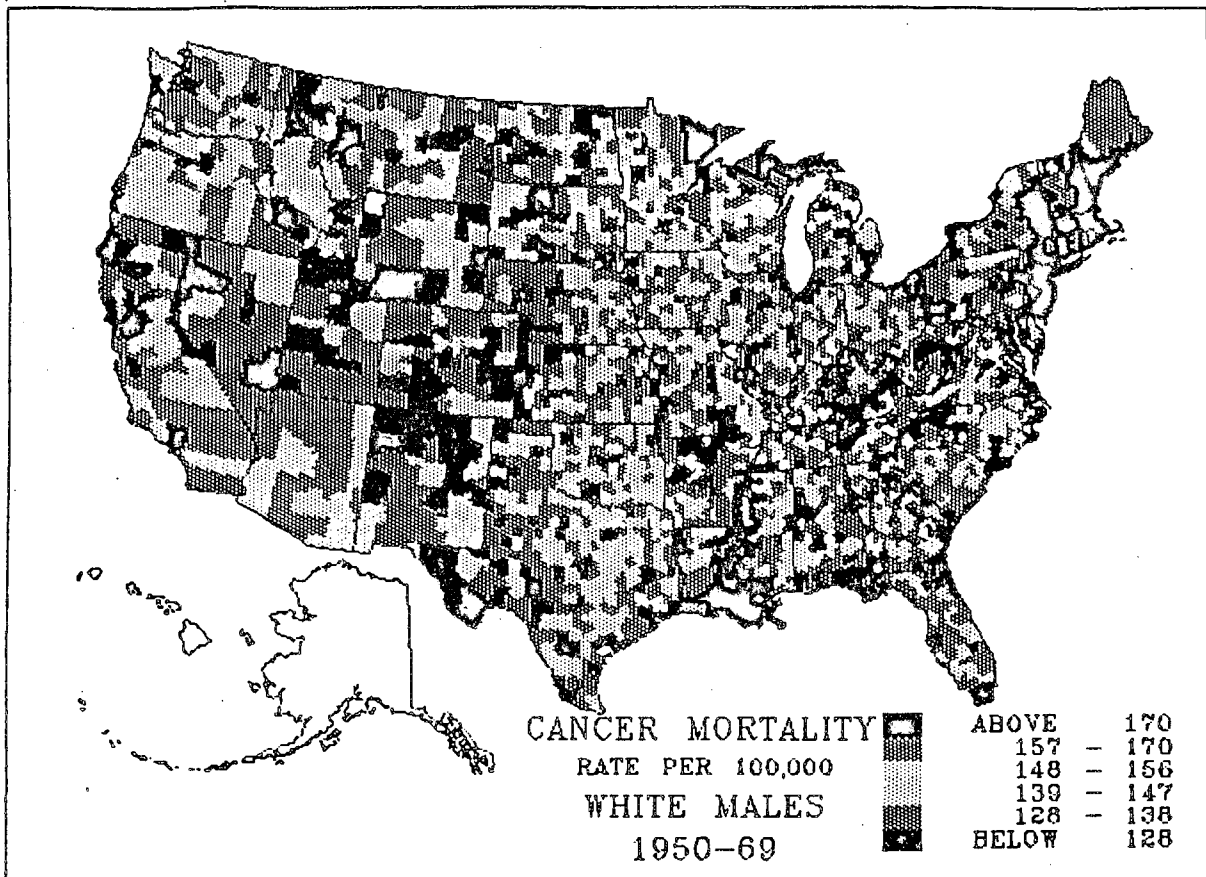
US By County CHOROPLETH MAP

This map represents annual average age adjusted mortality rates among white
males for all types of cancer combined. The data were tabulated from 20
years of death certificates (1950-69) [12,13].

CARTE MAPPING

CARTE is a thematic mapping system which has been under development at LBL
since 1972. While similar to other systems [14,15], it has concentrated on
interactive use and publication quality output.

CARTE was recently made available for the DEC VAX-11/780 minicomputer.
Changes were made to improve the user interface, the control logic and graphic
design portions of the system, and the graphics display functions.

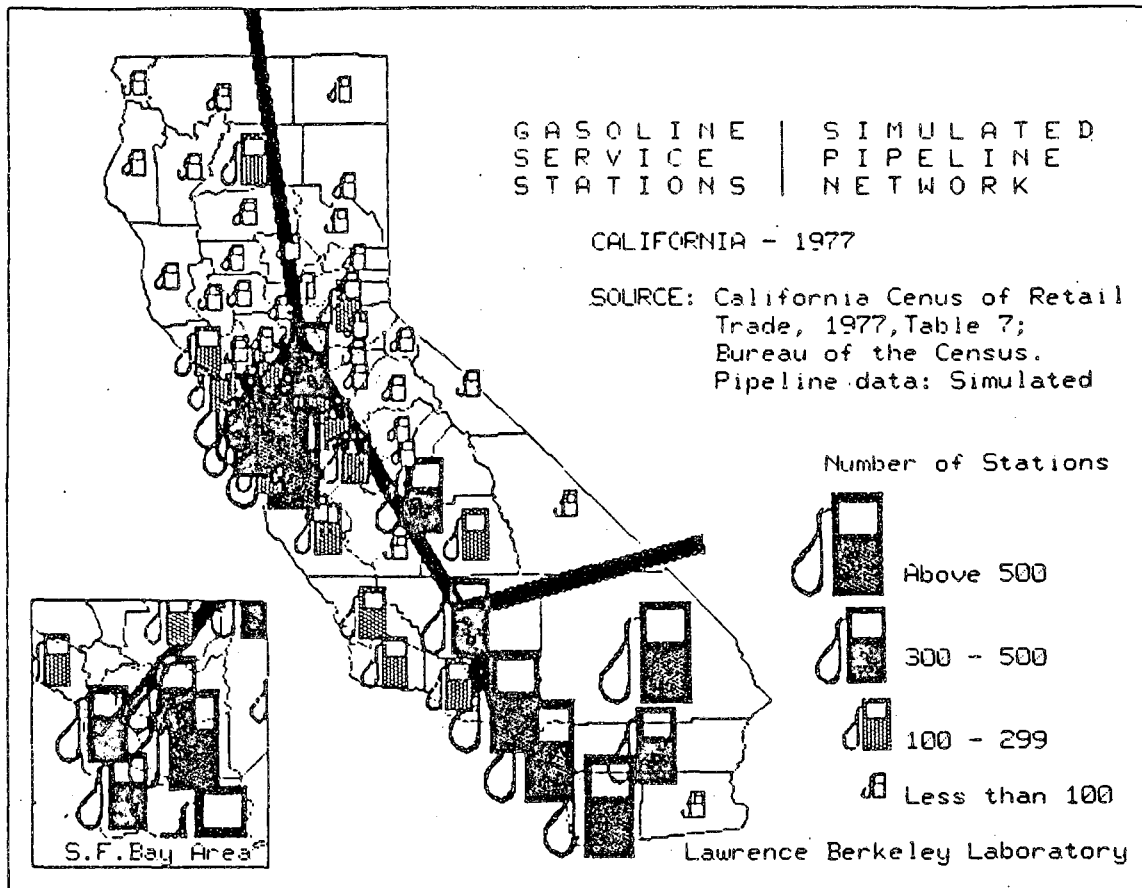The new user interface provides a script facility, better control of graphics
display parameters, and flexibility in adding new features to CARTE. This new
version is sufficiently modular that changes to the user interface can be made
with little difficulty. This capability will be used to explore a variety of
user interfaces to determine which user interface techniques work best with
CARTE's user community.

SEEDIS GEOGRAPHIC LEVELS

The various geographic levels available in either polygon or point location format are listed below. To the left is the abbreviated name for user selection in the AREA module [16].

Single-State portions of the total US files have been created so that geographic areas which cross state boundaries can be easily divided into their respective state portions.

AQCR	Air Quality Control Regions
AQMS	Air Quality Monitoring Stations
BEA69	1969 Bureau of Economic Analysis Areas
BEA77	1977 Bureau of Economic Analysis Areas
BECHT	Bechtel Energy Model Regions
CENSUS	1970 Census Regions
COUNTY	1970 Census Counties
COUNTY80	1980 Census Counties
FED	U.S. Federal ..egions
LMA	BLS Labor Market Areas
MCD70	1970 Census 35,000 Minor Civil Divisions
NATION80	World Data Bank I Countries
NCHS	Nat Ctr for Health Stat Cnty Equivalents
NCI	Nat Cancer Institute Cnty Equivalents
PAD	Petroleum Allocation District Regions
PLACE	1970 Census Places
PLBLS	Bureau of Labor Statistics Places
PLEPA	Environmental Protection Agency Places
PRSP80	1980 Dept of Labor Prime Sponsors
PUS70	1970 Census Public Use Sample Cnty Groups
SEA70	1970 U.S. State Economic Areas
SMSA71	1971 Standard Metropolitan Statistical Areas
SMSA73	1973 Standard Metropolitan Statistical Areas
SMSA75	1975 Standard Metropolitan Statistical Areas
STATE	U.S. States
STAQCR	Single-State Portions of AQCR's
STBEA69	Single-State Portions of BEA69's
STBEA77	Single-State Portions of BEA77's
STLMA	Single-State Portions of LMA's
STSMSA	Single-State Portions of SMSA's
STPUS70	Single-State Portions of PUS70's
STWATER	Single-State Portions of WATER's
STWRASA	Single-State Portions of WRASA's
STWRSA	Single-State Portions of WRSA's
TRACT	Census Tracts for Oakland–San Francisco SMSA
WATER	Water Research Council Water Resource Regions
WRASA	Water Research Council Aggregated Sub-Areas
WRSA	Water Research Council Sub-Areas

GASOLINE | SIMULATED
SERVICE | PIPELINE
STATIONS | NETWORK

CALIFORNIA - 1977

SOURCE: California Cenus of Retail
Trade, 1977, Table 7;
Bureau of the Census.
Pipeline data: Simulated

Number of Stations

Above 500

300 - 500

100 - 299

Less than 100

S.F. Bay Area

Lawrence Berkeley Laboratory

PICTORIAL SYMBOL MAP

This California by county service station range-graded symbol map was
made by CARTE using the Symbol command to generate the pumps. Symbol
shapes can be entered using a coordinate digitizer and can be stored
in a file.

Line locations are entered in the same format as GBF boundaries. A
choice of width and shading parameters are available for each separately
identified set of connected points.

CARTE SCRIPT FILE

A script file can be created in advance or it can be saved as the record
of an interactive session. Control functions include: multiple insets
(opptional with multiple data sets), software characters with a variety
of type fonts, multiple geography levels, and comprehensive selection of
color and patterns for shading [17,18].

MAPPING HARDWARE

LBL has a variety of graphic output devices. The GRAFPAC software drives
a selection of devices from Tektronix storage tubes to Ramtek raster CRT's
to Zeta plotters to a Dicomed film recorder.

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