MANAGEMENT INFORMATION SYSTEMS (MIS) FOR INFORMATION CENTERS USING
SAS/FSP\textsuperscript{1}, SAS/Graph\textsuperscript{1}, AND SAS/BASE\textsuperscript{1} SOFTWARE

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ABSTRACT

The Carbon Dioxide Information Analysis Center (CDIAC), sponsored by the Carbon Dioxide Research Division of the U. S. Department of Energy, has developed a Management Information System (CDIAC/MIS) that records and tracks a large number of the data center's varied information requests. CDIAC/MIS comprises three procedures: a menu-driven, front-end program written as an IBM/TSO CLIST; full-screen data entry and edit options written in SAS/FSP; and SAS execution modules written in SAS/Graph, SAS/BASE, or both. The CDIAC/MIS contains two SAS data bases: one records information requests and the other SAS data base is a distribution list for CDIAC's newsletter and other CO$_2$-related publications. The data bases can be manipulated to produce statistics and graphics that illustrate the information requests made by CO$_2$ researchers and policy makers and the types of persons on the distribution list. CDIAC/MIS facilitates the recording and processing of data by organizing and maintaining a permanent record of information center activities and by providing a mechanism to analyze information requests.

INTRODUCTION

The Carbon Dioxide Information Analysis Center (CDIAC) supports the nation's carbon dioxide (CO$_2$) research program by coordinating exchanges of information on global atmospheric CO$_2$. CDIAC's objective is to compile, evaluate, and distribute CO$_2$-related information. The Center's major functions include: distributing Department of Energy and CDIAC publications; publishing a CO$_2$ newsletter, CDIAC Communications; providing answers to information requests; searching CDIAC's computerized Bibliographic Information System; compiling, evaluating, and packaging numeric databases and computer codes; providing the means for the exchange of information among other data centers.

\textsuperscript{1}SAS, SAS/FSP, SAS/Graph, and SAS/BASE are registered trademarks of SAS Institute Inc., Cary, NC, USA.

\textsuperscript{2}Operated by Martin Marietta Energy Systems, Inc., for the U. S. DEPARTMENT OF ENERGY under contract No. DE-AC05-84OR21400.
and between them and CDIAC; and compiling a computerized distri-
bution list that identifies CO₂ researchers and policy makers.

As the number of requests for CDIAC's products and services increased and the distribution list grew, the manual system of
recording and processing the requests and the distribution list became too cumbersome. To manage the growing information
requests and distribution list data bases, CDIAC developed a
Management Information System (CDIAC/MIS) using SAS software
products. SAS software was selected because it is a multi-
functional software package that combines data base management
and recording, statistical analyses, and production of graphics,
tabular output, and specialized forms.

METHODOLOGY

CDIAC/MIS comprises three procedures: a menu-driven,
front-end program written as an IBM/TSO CLIST; full-screen data
entry and edit options written in SAS/FSP; and SAS program
modules written in SAS/Graph, SAS/BASE, or both. The CLIST
contains IBM/TSO (Time Sharing Operation) commands that combine
and organize a large number of related SAS program modules. This
combination forms a complex SAS system; however, a non-SAS user
can invoke the SAS software and execute the SAS programs because
of a user friendly menu (Fig. 1).

The system manages two SAS data bases. One data base is a
record of information requests for about 150 products and
services such as CO₂-related documents and bibliographic
searches. The second SAS data base is a distribution list, which
contains more than 3500 CO₂ researchers and policy makers from
150 countries, for CDIAC's newsletter and other general
CO₂-related publications.

From the CLIST, data input and output selections are made.
When the user chooses a data input option for one of the data
bases, the CLIST automatically executes a SAS program module that
contains SAS/FSP commands. The SAS/FSP commands open the SAS
data base that was chosen allowing the user to input new data or
edit existing data. When the user chooses an output option, the
CLIST automatically executes a SAS program module that contains
SAS/BASE or SAS/Graph commands. When a SAS/Graph option is
chosen, the graph is routed locally to a specified output device,
such as a pen plotter. When a SAS/Base print option is executed,
the printout is treated as a batch file and is routed to a remote
printer.

RESULTS

CDIAC/MIS enables the user to produce statistics
(Fig. 2) and graphics (Fig. 3 and Fig. 4) that illustrate the
information requests made by CO₂ researchers and policy makers
and the types of persons in the distribution list. The system
also executes program modules that allow an end-user to search
any variable in either of the data bases and to generate the
search results in the form of mailing labels (Fig. 5) or other
specialized output. CDIAC/MIS facilitates the recording and
processing of data by organizing and maintaining a permanent
record of the information center requests and distribution list
data bases and by providing a mechanism to update and analyze the
data bases.
Fig. 1. The CDIAC/MIS CLIST forms a user-friendly menu.
### COUNTRIES REQUESTING CDIC SERVICES

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Fig. 2. Frequency of countries requesting CDIC’s products and services.
Fig. 3. World map illustrating the distribution of CDIAC's products and services.

Fig. 4. Pie chart showing the distribution of carbon dioxide publications.
Fig. 5. Search routines generate mailing labels for carbon dioxide publications.
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