INTRODUCTION

Established in 1905, the Santa Rita Experimental Range has been the site of numerous field studies. Many of these studies spanned several years and involved the use of specific locations on the range known as study areas (Figure 1). These study areas have generated a wealth of information in the form of research reports, study plans, photographs, and maps (Figure 2). Most of this information was developed and maintained in hardcopy format. Much of the information is unpublished and existed only as original documents.

Study area documents for research initiated on the SRER between 1915 and 1949 was automated by scanning and stored in digital file formats with funding from the USDA Forest Service. Some 300 study plans, reports, and maps were stored in the Adobe PDF format and some 440 photographs were stored in the JPEG format with JPEG compression. These data files represent over 2 gigabytes of content.

APPRAISAL

What is required to make these automated data useful to researchers is a method of searching the data files that is based on standard types of queries. To this end, a relational database model was suggested that would support queries of the historic data by location and by type of research activity. This model was to be implemented in forest that would support queries in a client-server environment.

The first step in our approach was the development of a relational model that would support topical queries based on type of activity. Over 30 different research activities were identified for the logical search as shown in Figure 2. These activity types were developed from a domain of all types of research on the automated study area data. The structure of the resulting database is shown in Figure 2. A custom user interface was developed using Microsoft Access for the input of information about the activity types, locations, and dates of the studies.

OPERATION

The Study Area Database Search website is designed to facilitate user interaction with a supporting database containing information related to historic activities on the range. The web application provides tools that let users complete text or attribute based queries as well as map based queries. The images below provide examples of typical user interaction with the application.

The activity type query image presents the results of a user selecting an activity type. Here the user has queried for Burroweed Removal. The resulting study areas that have had Burroweed removal are listed in the browser window to the right of the map. The user has selected study area 131. The map component of the application identifies the location of study area 131 and displays a list of documents. Future improvements may have the listed documents be filtered based on the selected activity type.

The study area query result image shows the results generated by the user selecting a study area link in the lower left region of the browser window. The map display updates showing the study area location. The browser output window updates as well and lists the study areas activities with a link that when activated will list the documents associated with the study area in the query output window located below the map. The user can select a document for further review.

The results of an activity type query for Burroweed Removal. The user has selected study area 131 and selected one of study area 131’s images to view.

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