

Resource Baseline Mapping Training at DSC Described

Editor's Note: The following article was written for other Resource Management Trainees, but is included here because it contains much of interest to NPS scientists and managers in general.

By Bruce L. Freet

Recently I combined a trip to the Air Quality Course with an orientation and training session at the Denver Service Center (DSC). I spent three days at DSC and fulfilled several aspects of the information Baseline/Ecosystem Mapping component of my individual development plan (IDP). Some of the other Resource Management trainees have satisfied similar goals by attending the USGS Remote Sensing and Mapping course or the USFS Vegetative Mapping course, but I believe that a training session at DSC might be more pertinent to our needs.

Because it is part of the same agency we work for, the DSC staff shares common management philosophies and goals, is interested and conversant with the resource issues of our particular areas, and so can establish an interactive working relationship with us. Most of the DSC staff I dealt with had biological science backgrounds and understood my needs.

Gary Waggoner of the Remote Sensing Section was my host and created an itinerary that included baseline mapping materials and techniques, computer hardware and software for ecosystem maps (digital data base), a search for past and present aerial photography at the National Cartographic Information Center (USGS), a search of the Technical Information Center (DSC) files for historical documents and maps, plus discussions with micrographics personnel, regional planning teams and WASO staff for minerals management and air quality.

The majority of my time was devoted to developing a strategy for mapping resource baseline data. It needed to be practical NPS-operations-oriented, and yet provide the accuracy and compatibility for eventual computer entry. Objectives, costs, and benefits were examined. The flow chart evolved from these discussions. For example, we decided that all resource data should be mapped by theme or subject

(archeological sites, wildfire/year, exotic plant encroachment, etc.) on individual four mil. frosted mylar overlays, using mylar maps as the base. Whereas the dimensions of paper maps will vary with changes in temperature, humidity, and use, the mylar maps are stable. This assures greater accuracy, which is essential when the data are computerized later. The mylar bases (chromatin maps) are more expensive than paper, but their dimensions do not change over the years and they can be used to make very inexpensive black-and-white diazo paper copies (a few cents per copy).

We also discussed the benefits of using Universal Transverse Mercator (UTM) points for mapping resource data with some modifications for mapping fires. Because of their irregular size and shape, wildfires and prescribed fires will employ UTM coordinates to designate the ignition point. Size and shape will be depicted by actually drawing the fire perimeter on mylar overlay keyed to the chromatin base maps. (These can be precisely reproduced by the com-

puter). Information management is complicated to some degree by the Individual Fire Report, DI-1201 form and the FIREPRO data form, which require location by either Township and Range or latitude and longitude. However, the latitude/longitude coordinates can be converted to UTM coordinates and vice versa using the Remote Sensing Section's computer programs.

At the National Cartographic Information Center (NCIC) we conducted a preliminary file search on microfiche for black/white and color aerial photographs and on slides for Landsat 4 satellite imagery (digital data). We also requested that USGS search their files for high altitude photographs. These could form a resource baseline for Big Cypress National Preserve. From our initial findings, priorities were established to purchase certain photographs and magnetic tapes. This will be done through DSC. In the future, we can contract with DSC to classify and geo-reference the information on the magnetic tapes to form a digital data base.

REMOTE SENSING

IMAGES

PHOTOS

MANUAL PHOTO INTERPRETATION

PHOTO TRANSFER TO MAPS (Zoom Transfer Scope)

*DIGITIZE/SCAN RESOURCE INVENTORY MAPS

DIGITAL DATA BASE

DIGITAL DATA

COMPUTER CLASSIFICATION

GEO-REFERENCING

DIGITAL DATA BASE

*If good base line map data exist for an NPS area, it can be entered here and the above phases bypassed. Inquire further.

Photointerpreting the aerial photographs and then digitizing the results for entry into the computer is another way to create a digital data base. A third option is to digitize an NPS area's existing resource inventory/ecosystem maps for entry into the computer. The accuracy obtained depends almost entirely upon the scale of your source materials. For Big Cypress, I chose to use 1:24,000 map scale and resource inventory map overlays to further define the digital data base.

Using either SAGIS (Systems Applications Group Information System) or ELAS (Earth Resources Laboratory Applications Software - a NASA product), one can make virtually unlimited comparisons between and among different data themes. Both systems have extensive editing capabilities, allowing changes to the data base to be made easily at any time. Each requires special computer hardware; SAGIS runs on a Bureau of Reclamation mainframe computer in Denver while ELAS runs on the Remote Sensing Section's own minicomputer. There may be limitations to tying in to either of these systems from the field, but Denver is keenly aware of the potential problem and is working on solutions. In any event, I recommend thinking about getting your data base into a form that could readily be entered into a computer when desired.

Resource Management trainees can benefit enormously by organizing a training session at DSC as regional group. DSC will need some funding assistance to conduct the training, but as trainees, you can transfer funds to DSC from your special accounts. The best option in terms of cost and individual attention might be to have five trainees per DSC session. I would anticipate that you would want some unstructured time while there in order to pursue your individual interests. You should contact Dr. Maury Nyquist, Chief, Remote Sensing Section, and/or Dr. Harvey Fleet, Program Manager for Digital Cartography, to arrange for a training session. (303-234-4527).

Before going to DSC it would be helpful to read *Remote Sensing of Wildlife Resources: A State of the Art Review* by Robert C. Aldrich (GTR RM-71 Rocky Mountain Forest and Range Experiment Station, USFS, USDA, 240 W. Prospect St., Fort Collins, CO 80526). Three short articles have been published in *Park Science* (Spring 1981 and Winter 1983) which discuss natural resource data base construction at the DSC. Also check the DSC telephone directory or staff roster to see what other contacts you may wish to make.

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