Supporting Statement B for
USGS LANDSAT SURVEY
OMB Control Number 1028 - NEW

Terms of Clearance: None

Collections of Information Employing Statistical Methods

1.   Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

Potential Respondent Universe and Sampling Selection Method

To date, the users of moderate-resolution imagery have been essentially unknown. Nationwide, there is no information about the number of users, in what capacities they use the data, how reliant they are on the data, the benefits they derive from the data, and in what sectors of the economy they are situated. As a result, moderate-resolution imagery users are characterized as an unknown population because there is currently little knowledge about the extent and characteristics of the user population. Because this population is unknown, it is important to first effectively identify a sample from this population in order to conduct a comprehensive survey.

To identify the sample, we conducted a user assessment. The user assessment consisted of two parts. The first step was a web-based search to find a pool of potential professional moderate-resolution imagery users. Professional users are defined as those who use the imagery in their work, as opposed to users who use it for personal purposes (for example, people using Google Earth for vacation planning). We conducted an extensive online search to identify potential moderate-resolution imagery users using the following approach. We completed searches by state to ensure nationwide coverage using hundreds of keywords. Through this process, we identified just over 21,000 potential professional users. For these potential users, we recorded email addresses, as well as identified the sector in which they were working if possible.

The second step in the user assessment was to use snowball sampling to establish a seed of confirmed moderate-resolution imagery users from the pool of potential users and to increase that seed to create the sample Snowball sampling is a nonprobability recruitment method used when the target population is not easily identified, hard to reach, or when the sample characteristic is rare.   Using this method, we contacted the 21,000 individuals identified in the web search as potential users to: 1) verify whether or not they personally use moderate-resolution data in their work; and 2) elicit other potential users of moderate-resolution data. The initial group of respondents from this contact formed the seed on which the rest of the snowball sampling was based. The potential users identified by the seed were the first wave of users, who, in turn, were contacted and provided the second wave. The

outcome from contacting the second wave produced the third wave, which contributed to the fourth wave, and so on. In all, we conducted waves until less than 100 new names were generated, indicating a natural end to the snowball sampling; a total of six waves were conducted.

At the completion of the snowball sampling, a total of 3,883 nonfederal respondents agreed to participate in the study (1,067 federal employees also agreed to participate in this study). This sample represents professional users of moderate-resolution imagery. It is not our intent to sample occasional users or to generalize to a nationwide population. Only 440 refused to participate, which was less than 10% of those who responded.

In order to ensure that all sectors were represented in the 3,883 person nonfederal respondent list, we compared the sectors represented by these individuals to those of the initial list of 21,000 potential users from the web search. All the sectors are represented in approximately the same proportion among respondents as they are among the original list of individuals. We also compared the states represented by the respondent list and the initial list. There was less than a 3% difference for each state between the original list and the respondent list, again indicating that all states were represented proportionately in each list.

Expected Response Rate

Because the individuals in the sample have agreed to participate in the survey, we anticipate a high response rate. Additionally, we will adhere to follow-up procedures for web surveys outlined in Dillman's Total Design Method (2007). As a result, we anticipate an 80% response rate.

2. **Describe the procedures for the collection of information including:**
    *   **Statistical methodology for stratification and sample selection,**
    *   **Estimation procedure,**
    *   **Degree of accuracy needed for the purpose described in the justification**
    *   **Unusual problems requiring specialized sampling procedures, and**
    *   **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

Statistical methodology for sample selection:

This sample was self-selected in that the individuals contacted during the snowball sampling agreed to participate in the study. Because this sample of 3,883 nonfederal respondents is not random and the population cannot be determined a priori with an adequate level of accuracy, we will sample 100% of the respondents who have agreed to participate. Therefore the sample for this collection will not require stratification.

Estimation procedure and degree of accuracy:

To obtain the sample of professional users of moderate-resolution imagery, a web-search and subsequent snowball sampling procedure were conducted (described in B1). This resulted in 3,883 nonfederal users who agreed to participate in the survey. An 80% response rate from the sample of 3,883 individuals will be a sufficient degree of accuracy to

represent this sample of professional users of moderate-resolution imagery.

Because the population of moderate-resolution imagery users cannot be determined with a high degree of accuracy, there will be some limitations in the results. The results will not be generalized to the population, but will represent the broad sample of users we have identified in the snowball sampling. Results will give an indication of the uses and societal benefits of moderate-resolution imagery across key sectors. Write-ups of results will carefully describe the interpretive limitations of the data.

Unusual problems:

Because the population of moderate-resolution imagery users is essentially unknown, snowball sampling was initiated to identify a breadth of users across sectors. Based on the results of the snowball sampling (described in B1 above), we feel we have an adequate sample that effectively represents current users of moderate-resolution imagery.

Periodic data collection cycles:

No periodic data collection will occur.

3. **Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.**

Using the web as an alternative to other survey modes such as mail or telephone is becoming increasingly accepted (Couper, 2000). Web based surveys are often used as a strategy to decrease costs, increase the speed of data collection, and increase response rates with the hope of decreasing the amount of non-response error (Dillman, 2007; Schaefer and Dillman, 1998). To maximize the response rate, Dillman's methods for web-based surveys will be followed with some modifications. Because every person in the sample has already been contacted, three emails, instead of the usual four, will be sent. The initial email invitation will contain a link to the survey. Email reminders will be sent out 4 and 8 days later to all non-respondents, excluding those who wrote back asking to be removed from the survey. If the overall response rate is acceptable (above 70 percent) we will not conduct a non-response bias check. In this case we have a list of confirmed users of moderate-resolution imagery. Based on our prior contact, and the fact that they have already agreed to participate in the study, we consider this to be a very attentive audience. We feel that due to the highly technical nature of the respondents, they will be more likely to respond to a web-version versus a paper survey option. We predict that the response rate of 80% will be met. If our response rate is below 70 percent we will employ intensive methods (described by Dillman) to conduct a follow-up survey of non-respondents. The non-respondent form will be e-mailed to a statistically valid number of non-respondents of the subsample who have not responded to the web survey.

As indicated above, there are difficulties in generalizing from a nonprobability sampling technique such as snowball sampling. However, in this case, it is the best available method for reaching an unknown population. To mitigate the issues of representativeness, we have

relied extensively on the snowball sampling literature (e.g., Atkinson and Flint, 2001; Faugier and Sargeant, 1997; Blanken et al., 1992) to ensure the seed of confirmed moderate-resolution imagery users is as representative as possible of professional moderate-resolution imagery users in the United States (defined as those using the imagery for their work). Specifically, we obtained as large a pool of potential professional users as possible from all 50 states spanning all sectors including all levels of government (national, state, and local), private businesses, non-profit organizations, academic institutions, and tribes. Additionally, we used a variety of indirect sources accessed through the Internet to identify potential users. As a result, we feel this sample of confirmed professional users obtained from the pool of potential users is as representative as it can be of professional users of moderate-resolution imagery. However, we do not intend to generalize to the larger population of all moderate-resolution imagery users. In all results write-ups, we intend to fully explain the limitations of generalizing the data to the larger population of professional users. Those confirmed users who are willing to participate will be highly motivated to complete the survey and provide information on importance and value of moderate-resolution imagery. We recognize that these respondents will not represent all moderate-resolution imagery users. Results will be presented in terms of willing participants only, using either counts or percentages of the sample, as opposed to percents of the entire population of professional users. However, the individuals who will be surveyed represent a very large group of professional moderate-resolution imagery users across a breadth of sectors and application areas and will provide meaningful information regarding the importance and value of the imagery not currently available.

4. **Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.**

During the 2008 17th William T. Pecora Memorial Remote Sensing Symposium, we asked twelve individuals (5 from federal government, 5 from academia, 1 from local government, and 1 from the private sector) working in the field of remote sensing to review the survey instrument. The purpose was to use this audience to help us refine and improve the utility of the instrument. Each participant was given a hard copy version of the survey. Their instructions were to review the survey and provide comments concerning the overall structure, sequence and clarity of questions. We did not ask these individuals to estimate the time burden of the survey.

We evaluated the comments and suggestions provided by the reviewers and revised the survey instrument accordingly. Most of the comments were incorporated, particularly those that improved technical clarity and comprehension. See Question 8 Part A for more detail on reviewer comments on the survey instrument.

During the Federal Register Notice, we will solicit additional input to the instrument from these same individuals (listed in Question 8 Part A) and ask that they provide the final comments.

5. **Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.**

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