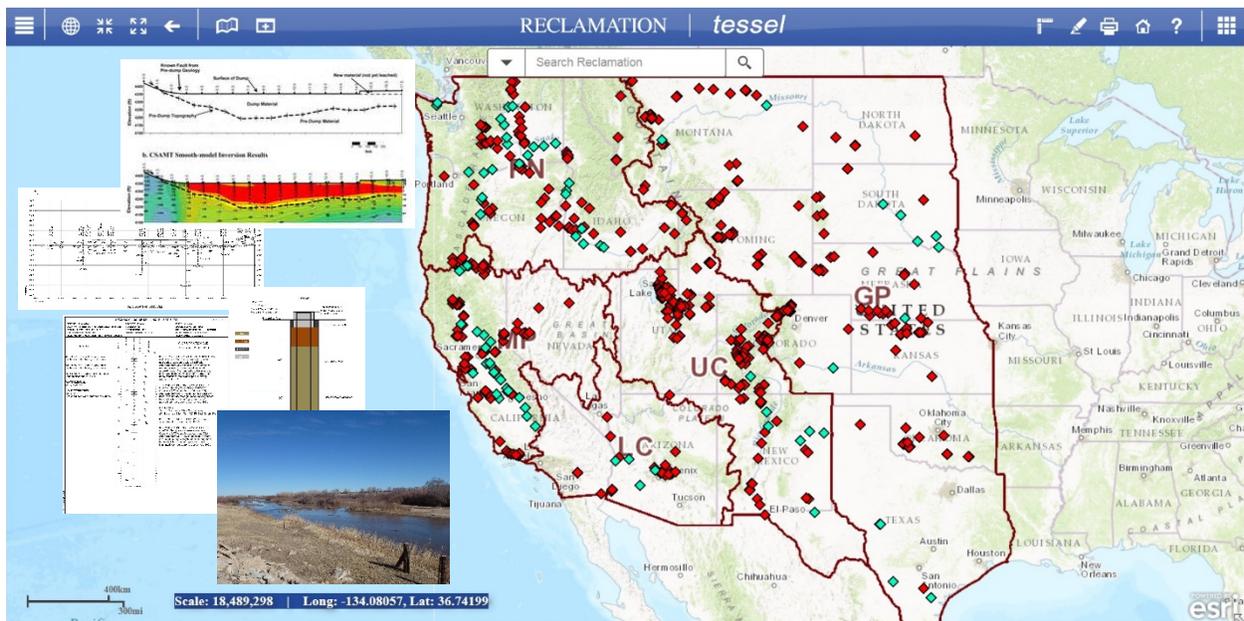


# RECLAMATION

*Managing Water in the West*

## Reclamation-Wide Site Investigation Data on Tessel

Research and Development Office  
Science and Technology Program  
(Final Report) ST-2016-9895-01



U.S. Department of the Interior  
Bureau of Reclamation  
Research and Development Office

September 2016

## **Mission Statements**

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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**Peer Reviewer:** I have reviewed the assigned items/sections(s) noted for the above document and believe them to be in accordance with the project requirements, standards of the profession, and Reclamation policy.

Reviewer \_\_\_\_\_

(Signature)

# Executive Summary

Preliminary research has been performed to determine if a non-project specific database for comprehensive use within the Bureau of Reclamation's web-based GIS system (BORGIS or Tessel) will be of value to Reclamation. This centralized database will allow for transparent dissemination of data across regional, local and area offices, congruent with the goals of the Reclamation Data Council (RDC). This preliminary or scoping research was accomplished by polling Reclamation's regional offices and select Technical Service Center (TSC) employees to find out:

1. If a comprehensive site investigation database is of value?
2. What types of databases are currently in use and how are they managed?
3. What types of data are being utilized and what format is the data reported in?
4. What is Reclamation's propensity to support (fund) maintenance of database(s)?

Answers to these questions will assist Reclamation in determining if a comprehensive database is a worthy venture, while also obtaining feedback from Reclamation employees on the major challenges/considerations in creating such a database. The results of this scoping research effort will assist the RDC, BORGIS Technical Team, and Reclamation Geospatial Coordination Council in developing good practices and procedures in creating and maintaining site investigation database(s) with a GIS component.

The results of the questionnaire are summarized as follows:

- ✓ Approximately 77% of respondents believed a comprehensive database would be valuable to Reclamation.
- ✓ About 69% of respondents were not aware of or did not use any databases; however, the remaining respondents used a combination of internal, private and public databases to improve their decision making. Databases were generally managed by one or two individuals and were often out of date.
- ✓ Approximately 65% of the respondents indicated multiple formats used to report site investigation data and only 10% reported adhering to an unchanging standard reporting format.
- ✓ 60% of the respondents who had authority to approve funding were not willing to finance efforts associated with data stewardship (gather, organize and manage data for use in a database).

The critical components of creating and maintaining such a comprehensive database are standardization of data collection and reporting, database maintenance, and funding once initial project funding is gone. The following recommendations are suggested:

1. Develop a support group for database stewards and managers by creating a sub-group under the RDC and mandating membership.
2. Promote database awareness and utilization through this RDC sub-group.
3. Use hydrology databases (Reclamation Hydrologic Data Base (HDB), Montana water database (GWRAT) and Texas water database (TWDB) to name a few) as "role models"
4. Design methodology for standardizing metadata and incorporating data into Tessel.
5. Use information provided by respondents to begin developing a database steward contact list and database inventory list.
6. Use results of this questionnaire to justify non-project funds (i.e. research funding) to finance database management efforts within regional and area offices.

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## Background

Preliminary research has been performed to determine if a non-project specific database(s) for comprehensive use within the Bureau of Reclamation's (Reclamation) web-based GIS system (BORGIS or Tessel) would be of value to Reclamation database users. This centralized database will allow for transparent dissemination of investigation information across regional, local and area offices, as well as the capability to perform detailed query searches and geospatial statistical analysis. The intent is to provide general site investigation data to design engineers and stakeholders to quickly assess the level of site investigation information available.

The success of such a system would be congruent with the goals of the Reclamation Data Council (RDC) to reduce redundancy and create efficiency in streamlining geospatial data and the accessibility of data [1]. In addition, a successful system would bring Reclamation closer to satisfying the OMB M-13-13 Federal Open Data Policy, particularly in regards to groundwater data which is most commonly gathered from site investigation data such as, monitoring wells, piezometers and boring logs.

## Proposal Development

Currently there are many databases used by regional offices, stakeholders, and the TSC. These databases are compartmentalized (accessible to a small population such as a specific region), non-standardized, region or project specific, and have limited search capabilities. This scoping research was accomplished by polling Reclamation's regional offices and select TSC employees to find out if a comprehensive site investigation database would be valuable. The researcher also sought to identify the types of databases currently in use, as well as the types of data being utilized and what format the data is typically reported in. Feedback from Reclamation employees on the major challenges with and considerations for creating a comprehensive database will assist the RDC, BORGIS Technical Team, and Reclamation Geospatial Coordination Council in their mission to develop and support Reclamation GIS data.

## Results

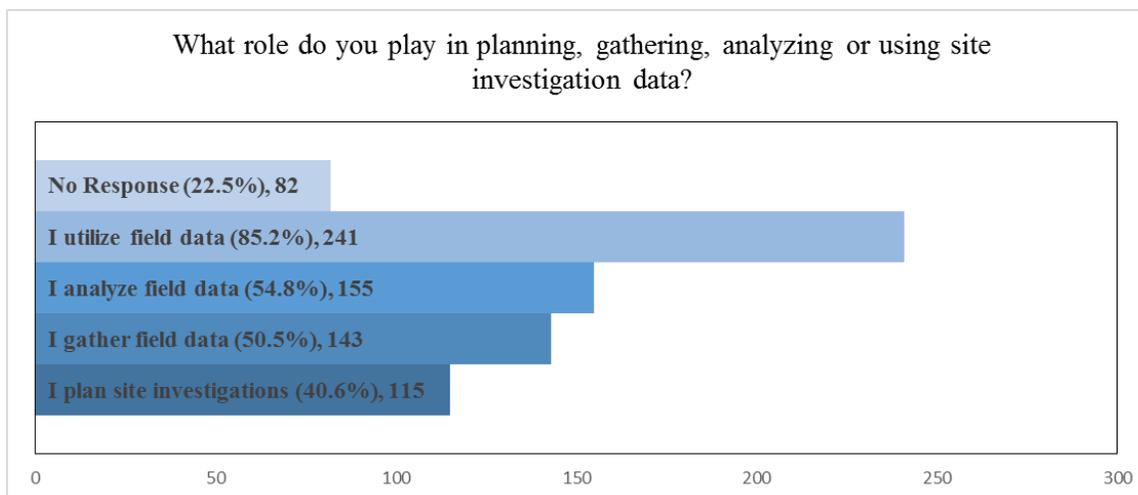
A total of eight questions were posed to staff in the Great Plains (GP), Lower Colorado (LC), Mid-Pacific (MP), and Pacific Northwest (PN) regional and area offices, as well as a select number of TSC representatives. The majority of the responses were collected from Reclamation Regional staff, because the majority of Reclamation site investigation data is gathered and managed by regional offices. The questionnaire consisted of three 'yes' or 'no', three multiple choice, and two brief statement questions, totaling eight questions that could be answered in less than five minutes. The questionnaire was limited in scope to minimize the time required to complete it, thus potentially increasing the number of responses. The questionnaire was created using Google Forms, integrated with Bison, allowing for distribution by email. The respondents were able to answer the questions, edit their responses and view a synopsis of all responses given. Respondents were not required to answer all question. Therefore the total number of people who responded to question one is different than the total responding to question 2. Respondents were kept anonymous, but were able to provide additional information, to include contact information, if desired.

## Reclamation-Wide Site Investigation Data on Tessel

The questionnaire, included herein as Figure 1, was available on Wednesday, September 7<sup>th</sup> through Wednesday, September 14<sup>th</sup>, 2016. Google Forms recorded a total of 365 responses which are summarized in Appendix A. The results are discussed in the following sections.

### Grouping of Survey Respondents

The first question asked respondents about their direct involvement in data collection, analysis and/or use. The respondents were able to make multiple selections to answer this question. The results are displayed in Figure A.:



*Figure A - Result of Question No. 1*

Approximately 78% (283/365) of respondents checked at least one box for Question 1 indicating that they have some involvement in planning investigations, data collection, analysis and/or use. This question provided an opportunity to segregate respondents into several categories for the remaining questions to discern whether there was a trend between data planners, collectors, analyzers and users. In addition, those who answered the survey, but did not respond to Question 1 were assumed to have no involvement with Reclamation site investigation data, and were segregated into another category.

In order to group the respondents into categories based on their involvement with Reclamation investigation data, the number of responses to question 1 were tallied. A total of 82 respondents did not respond to the question and are therefore assumed to have no involvement with investigation data. A total of 112 respondents checked only one box, of which 9 only plan site investigations, 17 only gather field data, 9 only analyze field data and 77 only utilize field data. The large number of respondents who answered the question as only utilizing field data comprise the second grouping. The remaining respondents comprise the third and final group, the majority of which (171/206) checked more than one box to answer Question 1. The grouping is as shown in Table A:

*Table A - Grouping of Respondents*

Group	Investigation Data Use	No. of Respondents	Percentage of Respondents
A	plan/gather/analyze/utilize	171	46.6
B	utilize	77	21.1
C	no use	82	22.5

## Reclamation-Wide Site Investigation Data on Tessel

The remaining responses to the questionnaire will be discussed based on the overall group and the above subsets. Note that Group A is largely responsible for creating site investigation data, while Group B utilizes the data. Both groups are considered to be direct benefactors of a comprehensive database. Group C does not have any dealings with site investigation data, but may have some knowledge or ideas on current Reclamation databases.

### Value of a Comprehensive Database

A total of 338 respondents answered Question 2, of which 261 (77.2%) saw benefit in creating a Reclamation-wide site investigation database while 77 (22.8%) did not. Group A and B had similar responses, both largely valuing a comprehensive database, with Group A having a total of 86.1% positive responses and Group B with 66 (66/77) positive responses. Group C was not as supportive with 27 “yes” responses, 32 “no” responses and 23 respondents did not answer the question.

A number of responders provided brief feedback as to why they valued a comprehensive database.

- “I think that having Geo-Referenced design data collections would be a huge benefit, and eliminate duplication of costs/efforts to collect the same data twice...I really like this idea...and think it could save significant costs.” – Respondent #1 [Group A]
- “If a site existed: various geological, geotechnical, and geophysical data is used in the design of structural features...Target audience would be designers...Great Idea! Proactive.” – Respondent # 5 [Group A]
- “There is so much data that could be utilized and is not currently being managed or utilized properly. This would be a great thing.” – Respondent #43 [Group A]
- “Each region has a geology-geotech library that contain numerous historical reports, logs and maps. Currently, Reclamation is dismantling all libraries in an effort to be ‘paperless’. The libraries are used extensively by geologist, geotechs, designers and project planners. Management of the current libraries are collateral duties that fall to the work group or branch in which they reside.” – Respondent #57 [Group A]
- “We document graphically with Auto Cad Drawings so in many ways a database would double the workload. However, Geo-referencing our drawings within GIS seems both worthwhile and reachable goal.” - Respondent # 73 [Group A]
- “Biology information is not catalogued well within Reclamation. So much so that institutional knowledge is used to spread word for ESA reviews on species within project areas.” – Respondent # 83 [Group A]
- “The Provo Area Office has discussed this very issue of developing a database of survey information, infrastructure, geology and drilling information. We are looking at getting the information into a GIS format, but would be interested in seeing what else is being considered.” – Respondent # 121 [Group A]
- “We need a GIS database that gives information on the sites NEPA has been completed.” – Respondent # 191 [Group A]
- “I think this is a great idea, much overdue and needed, and please include environmental data such as endangered species, habitat restoration projects, cultural resources, etc.” – Respondent # 243 [Group A]
- “Enterprise GIS is used by all other DOI offices and I cannot communicate our data with them. It is critical for data collection in all aspects of the USBR from lands and realty to engineering for us to have this capability. “ – Respondent # 246 [Group A]

## Reclamation-Wide Site Investigation Data on Tessel

- "...a Reclamation-wide site investigation database that has a GIS component would be highly beneficial. Centralizing this information could provide a comprehensive resource across Reclamation that has potential to enhance business decisions." Respondent # 260 [GIS specialist with the LC Region – Phoenix Area Office, Group A]
- "The ability to automate, or at the very least streamline the acquisition and maintenance (probably the more important of the two) of data would: significantly increase productivity of those that use it by making us more efficient in accessing reliable data and generate more creative and thorough solutions to situational problems." – Respondent # 276 [Group A]
- "Because there are so few Land Surveyors in Reclamation, other than certain reports to TSC in Denver, each individual, or group, appears to have their own database for their own use. I am an 'individual' one person survey group, and my data is stored for my own use, and for historic records." – Respondent # 304 [Group A]
- "The UC Drill Crew reports through me. I have been planning to do something like this with all of the new (and old) data we collect/have collected. I would be very interested in being part of the conversation related to this development. - Manager, Field Engineering Division, Provo Area Office, Upper Colorado Region." – Respondent # 308 [Group A]
- "Interested in a system to manage geotagged photos." – Respondent # 348 [Group A]

A few respondents provided feedback on why they did not think a comprehensive database was valuable to Reclamation.

- "We have been placing our data in EPA STORET for multiple decades (at least early 1970's). It seems disingenuous to reinvent the wheel for something that is already available. A plethora of different databases only leads to investigators not having access to data that has been paid for by public funds at their disposal. I believe the last time Denver tried this approach was late 1990's, after USGS came up with their own database." – Respondent # 205 [Group A]
- "I do not believe Reclamation needs a complete one shop data base location. When Denver helps us on field work we provide them with the appropriate data sources for each effort. Our main concern would be the cost of setting up, populating and maintaining such a data base. We do not need to incur additional charges for a service we may use only once or twice a year...Maybe the effort should be to encourage regional offices to set up or organize a site investigation data base for their area of operation. The information across regions is more consistent than information across Reclamation. Each region has unique characteristics not found in other regions." – Respondent # 273 [California, Group A]

A number of responders provided comments on creating or maintaining a comprehensive database:

- "I think it is a great idea, and something that is needed Reclamation wide. There is a vast amount of information in general in digital and hard-copy formats stored in various locations. The usefulness of all of this information would be greatly improved if consolidated into a GIS Database that can then be used to easily locate and analyze the information. The challenge is making it a priority, and obtaining the funding to complete such an effort." – Respondent # 128 [Phoenix Area Office GIS Branch, Group A]
- "Many online databases exist that are valuable in collecting data before a site visit. Ensure this one is not redundant and also keeps sensitive information safe. TWDB keeps well log records currently on their site in a sensitive, but open information way that is worth using as a template." – Respondent # 168 [Group A]
- "While I feel a database is useful, there is a significant effort involved in creating the database, but I feel the most difficult is in maintaining the database. An easy to use database – both for querying and for uploading is necessary." – Respondent # 200 [UC Region, Group A]

## Reclamation-Wide Site Investigation Data on Tessel

- “This proposed database would be very complicated and most likely not always reflect the effort or documentation required to provide the data. Simple explorations would be documented, but often explorations are dynamic and sometimes data collected does not fit the method used. Geology does not fit well into boxes.” – Respondent # 207 [Group A]
- “Gathering existing data into one place has some benefit, but there is no substitute for site-specific data related to a particular activity. As an agency, we have largely abandoned our traditional design data efforts and we pay for it over and over in contract modifications and delays. Also, assembling data obtained by different individuals over many years introduces the possibility of geospatial reference confusion – which datum was used, which coordinate system was used, etc. Database site data is only of value in final design if it is properly reference by qualified surveying personnel.” – Respondent # 266 [Group B]
- “This sort of thing has been attempted in the past and failed due to lack of long-term support and training of individuals responsible for field data collection. A wise strategy might be to embrace the use of a commercial software tool region-wide avoiding the risk of losing expertise and the entire enterprise.” – Respondent # 340 (examples provided) [Group A]
- “...see the need for standardization in the measurement and collection processes. Also standards in the data format to be inclusive for observed field notes and other forms of metadata....Sooner or later some standards will have to be discussed.” – Respondent # 353 [Group A]

The majority of respondents valued the idea of a comprehensive database. Overall, respondents believed a comprehensive database would provide a more transparent data collection process and a more streamlined dissemination process, allowing for more efficient and effective decision making. Many respondents also talked about the challenges of creating and maintaining a comprehensive database to include high variability in data measurement, collection, reporting, and data maintenance efforts.

## Current Databases

The respondents were asked if they were aware of any current database(s) used by their group or region. Alarming, 68.8% of the 349 that responded to the question (240) were not aware of any databases. Over half 57.6% of Group A respondents were unaware of existing site investigation databases, along with 62 Group B respondents and 60 Group C respondents.

Despite the lack of database knowledge displayed by the overall questionnaire pool, 92 respondents from Group A, 18 from Group B, and 8 from Group C were able to provide some information about the databases used by themselves or their group. The most prevalent and simplistic form of database used consisted of a structured file system on a server or sharepoint site, as mentioned by several respondents where final reports, documented investigations and analysis were stored and archived. Some respondents mentioned having or being aware of a departmental Access or Oracle database used to store and query final reports or testing information. Respondents also mentioned internal relational databases used for tracking projects, reports, or data for analysis. Examples shared by respondents include:

- PCQAS Earth and Concrete – Concrete compressive strength and field tests database
- SEL – Software for electrical protection devices and
- Solinst/In-situ – water data logger proprietary data storage system

These databases were generally used by a group of people. The data management system is proprietary and potentially shareable.

Respondents also mentioned interagency collaborative program databases, which are typically project specific, such as:

## Reclamation-Wide Site Investigation Data on Tessel

- Arkansas-Valley Conduit (AVC), Colorado water pipeline project GIS database
- Central Valley Project, San Joaquin River Restoration Program (SJRRP), California GIS database

These databases were funded by a project or stakeholder and managed by regional or GIS office personnel.

Several respondents mentioned state, government or organizational/municipal databases used to perform their functions such as:

- ArcGIS – online GIS software, Geodatabase and resource, manufactured by ESRI
- ArcSDE – An ArcGIS product suite, Spatial Database Engine, for geo-spatial query
- USGS – U.S. Geological Survey, national geologic map database
- CDEC – California Data Exchange Center, water data
- FRPP MS – Federal Real Property Profile Management System
- SHPO – State Historic Preservation Office, each state has their own data management
- Geothermal NEPA – National Environmental Policy Act, geothermal database
- GWRAT – Montana DNRC Water Resource Division water rights query system
- TWDB – Texas water database, “...keeps [records] in a sensitive, but open information way ... worth using as a template.” – Respondent # 168

The following Reclamation managed databases were mentioned by respondents:

- Tessel – Reclamation’s GIS database or BORGIS
- DSDams – Reclamation Dams database
- HDB (LC, UC, YAO) – Hydrologic database, Lower Colorado, Upper Colorado, Yuma Area Office: Colorado Basin/River, reservoir and gaging database
- HDB-poet – Hydrologic database visualizing, analyzing and editing tool
- HyMoP – hydrologic monitoring program, GP Region, Eastern Colorado Area Office

When speaking specifically about Reclamation’s GIS database(s), to include BORGIS and/or Tessel, respondents had the following comments:

- “Recommend that the GIS database be Arc query capable.” – Respondent # 8 [Group A]
- “I currently use our TESSEL site to look up land use data. I work as a realty technician and frequently respond to land use queries.” – Respondent # 76 [Group B]
- “It would also be nice to integrate the CNDDDB (CDFW), NWI (USFWS), local land info, and Corps mitigation site information.” – Respondent # 112 [MP Region, Environmental Compliance and Conservation, Group A]
- “We have various GIS databases that are managed primarily by myself (the GIS Data Manager). However the databases seem to be incomplete, as there are many hard-copy records that have not been converted into GIS, and updates are not always pushed to the GIS Branch.” – Respondent # 128 [Group A]
- “We work with a myriad of independent databases - and consolidation into a centralized system could be very helpful. We use operational data that is stored in our operational models, as well as in spreadsheets.... and data stored in various locations by various agencies.” – Respondent # 136 [Group A]
- “The Provo Area Office has discuss[ed] this very issue of developing a database of survey information, infrastructure, geology and drilling information. We are looking at getting the information into a GIS format, but would be interested in seeing what else is being considered.” – Respondent # 121 [Group A]

## Reclamation-Wide Site Investigation Data on Tessel

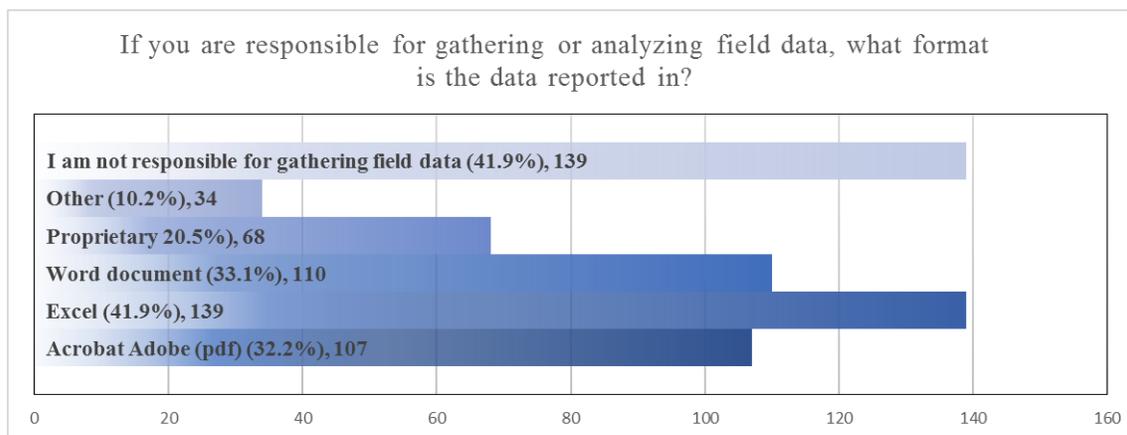
- “I am also working on development of a comprehensive database in SQL format for the Rio Grande Project. UC Region, Albuquerque Area Office, Water Management Division.” – Respondent # 136 [Group A]
- “My database is all on Indian lands, and you would need the permission of the tribes to include it in a database. They're not likely to provide it.” – Respondent # 89 [Group A]

## Site Investigation Data and Reporting Format

The study included an introductory statement which briefly defined site investigation data as any data obtained in the field for Reclamation use, to include survey data, soil boring and/or test pit logs, well logs, and geophysical data. Many respondents listed additional types of data that they believed should be included in a comprehensive database:

1. Survey data (topographic)
2. Groundwater data
3. Reservoir gauging data
4. Photos
5. Environmental data (endangered species, habitat restoration projects, cultural resources, fuel storage tanks, hazardous/contaminated sites)
6. Water quality data
7. Biological data (fish, habitat)
8. Weather/climate
9. Air quality
10. Construction testing
11. Agricultural data (vegetation cover, USDA soil textures)
12. Archeological data

The respondents were asked what format their site investigation data was reported in. The following results were obtained:



**Figure B - Results of Question No. 5**

The majority of the respondents indicated multiple formats used to report site investigation data. When asked if the data was presented in a standard reporting format 33.8% (99/293) of respondents said no, 30.7% (90/293) reported using a standard reporting format that was subject to change, 25.3% (74/293) had no knowledge of a standard reporting format, and 10.2% (30/293) reported having rigorously adhered to a standard reporting format.

## Reclamation-Wide Site Investigation Data on Tessel

Respondents that listed proprietary software or ‘other’ listed the following software was used to create/report data:

1. ArcGIS, ArcMAP
2. Google Earth Pro
3. gINT
4. AutoCAD to include Civil 3D, Recap
5. \*.csv files
6. Adobe Captivate
7. Surfer
8. PCQAS Earth and Concrete
9. RockWorks
10. ESRI
11. Shape files (GIS)
12. LiDAR
13. Pisces, Pisces2
14. TNP
15. RiverWare
16. InspecTech
17. Trimble - Pathfinder Office, TerraSync, Geomatics Office, Business Center
18. Crystal Reports
19. HEC-DSSVue
20. HDB-Poet
21. Aquatic Infomatics

Data collected by some of the proprietary/other software listed above such as ArcGIS, gINT, HDB-Poet can be easily integrated into a database using programming controls and standardized metadata. Others will need to be queried using SQL programming tools to identify and collect standardized metadata. The level of programming will be based on the variation in the data and data reporting formats.

## Funding a Comprehensive Database

The respondents were asked if they were willing to fund the effort to gather, organize, and manage a database. The majority (276/336, 82.1%) of the respondents who answered the question indicated that they do not have the authority to approve funding, approximately 10.7% (36/336) said no, and 7.1% (24/336) said yes. Within Group A, 19 respondents with the ability to approve funding answered favorably, while 22 did not; within Group B, 4 of 75 responses were positive and 9 were not; within Group C, only 1 respondent out of 57 said yes, while 5 said no.

The respondents had the following to say about funding a comprehensive database with GIS component:

- “Funding provided/issued would be project funds for initial gathering of data but not to manage a Reclamation-wide system. My understanding in the future eDerms (spelling) would be such a database system, but would require some sort of historical means to populate the system.” – Respondent # 5 [Group A – non funding authority]
- “I would be willing to provide a small amount of funding as part of the close out of site investigations to fund this work. However, providing funding for past site investigations will be very difficult due to funding limitations.” – Respondent # 50 [MP Region, Planning Division, Group A]

## Reclamation-Wide Site Investigation Data on Tessel

- “Because our group is direct funded by those programs or projects we work on, we do not have additional funding that could be used to support development of this tool.” – Respondent # 120 [Group A]
- “My database is all on Indian lands....As far as funding it, since my funding is not guaranteed from year to year, I probably couldn't help with it.” – Respondent # 89 [Group A]
- “I am an advocate of relevant, standardized data collection and reporting. I can suggest funding be provided to accomplish this goal.” – Respondent # 158 [UC Region Geology Group, Group A]

## Conclusions and Recommendations

A total of 365 responses were recorded for the Reclamation-wide Site Investigation Data questionnaire, of which:

- ✓ 283 (78%) had direct dealings with site investigation data,
- ✓ 118 were able to provide some information on the databases used,
- ✓ 332 were able to provide some information as to the format their data is reported in, and
- ✓ 60 funding authorizers stated their disposition to fund the effort to gather, organize, and manage a database.

Approximately 77% of respondents believed a comprehensive database would be valuable to Reclamation. Many of the responders cited reasons such as minimizing redundancy, providing data transparency, and streamlining and improving effective decision making as the benefits of a comprehensive database. The critical components of creating and maintaining such a database were standardization of data collection and reporting (particularly survey data), maintaining the database (data stewardship), and funding maintenance efforts once project funding is gone.

About 69% of respondents were not aware of or did not use any databases; however, the remaining respondents used a combination of internal, private and public databases to improve their decision making. Many hydrological databases exist, while there are very few biological and archeological databases available to Reclamation users. Databases were generally managed by one or two individuals and were often out of date. A few respondents commented on having a database but losing the data steward or data management expertise. Some respondents expressed a desire for support in creating and/or maintaining databases and some respondents asked to be included in any comprehensive database project. Contact information was provided within the survey results presented in Appendix A.

The majority of the respondents indicated multiple formats used to report site investigation data and only 10% reported adhering to a unchanging standard reporting format. Often respondents used proprietary software and/or excel to produce and analyze data and then presented the final report of data using Word document and Adobe Acrobat pdf. The variability of reporting formats and software will make it difficult to standardize database building procedures and techniques.

The majority (36/60) of the respondents who had authority to approve funding were not willing to finance efforts associated with data stewardship (gather, organize and manage data for use in a database) because of limited funds and resources specifically needed for current project work.

Based on results of the questionnaire, Reclamation would value a comprehensive site investigation GIS database however, there are significant efforts required to develop such a database. The following recommendations are suggested:

## Reclamation-Wide Site Investigation Data on Tessel

1. Develop a support group for database stewards and managers by creating a sub-group under the RDC and mandating membership.
2. Promote database awareness and utilization through RDC sub-group.
3. Use hydrology databases (HDB, GWRAT, TWDB) as “role models”
4. Design methodology for standardizing metadata and incorporating data into Tessel.
5. Use information provided by respondents to begin developing contact list and database inventory list.
6. Use results of this questionnaire to justify non-project funds (i.e. research funding) to finance database management efforts within regional and area offices.

## References

[1] "Charter for Reclamation Data Council," Bureau of Reclamation, Department of the Interior, March 25, 2016.

9/20/2016

**Figure 1**

Reclamation Site Investigation Data

## Reclamation Site Investigation Data

This survey seeks to gather the opinions of interested parties to determine whether a Reclamation-wide site investigation database would be useful. Site investigation data is any data obtained in the field for Reclamation use, to include survey data, soil boring and/or test pit logs, well logs, geophysical data, etc. This database would have a GIS component with the capability to perform detailed query searches and spatial statistical analysis. Please take a moment to answer the following questions. Please provide comment by Wednesday, September, 14, 2016.

**1. What role do you play in planning, gathering, analyzing or using site investigation data. Please check all that apply.**

*Check all that apply.*

- I plan site investigations.
- I gather field data.
- I analyze field data.
- I utilize field data.

**2. Do you see a benefit in creating a Reclamation-wide site investigation database as described in the opening statement of this survey?**

*Mark only one oval.*

- Yes
- No

**3. Are you aware of any current database(s) used by your group/region?**

*Mark only one oval.*

- Yes
- No

**4. If you answered yes to the question above, can you provide a brief statement about the type of database used, who the target audience is, and whether the database is managed by a group of persons or one individual?**

.....

.....

.....

.....

9/20/2016

**Figure 1 Continued**

Reclamation Site Investigation Data

**5. If you are responsible for gathering or analyzing field data, what format is the data reported in?**

*Check all that apply.*

- Acrobat Adobe (pdf)
- Excel
- Word document
- Proprietary software (Please state software name in the Additional Comment section, at the end of this survey.)
- Other (Please include details in the Additional Comment section, at the end of this survey.)
- I am not responsible for gathering or analyzing field data.

**6. If you are responsible for gathering or analyzing field data, do you use a standard reporting format?**

*Mark only one oval.*

- Yes, we have rigorously developed a standard reporting format that we adhere to.
- Yes, but the standard format is subject to change.
- No
- I do not know.

**7. As a planner and/or user of site investigation data, would you be willing to fund the effort to gather, organize, and manage a database.**

*Mark only one oval.*

- Yes
- No
- I do not have authority to approve funding.

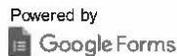
**8. Additional Comments: Please provide your region and/or work group information here. Feel free to add any additional comments you may have.**

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.....

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.....



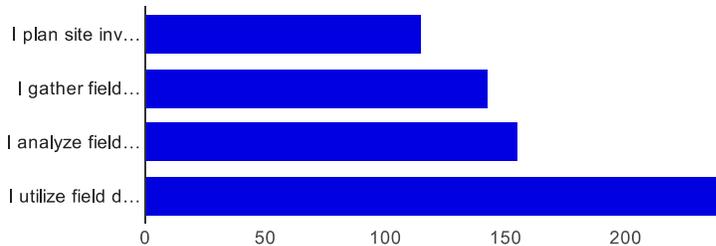
**Appendix A Reclamation-Wide Site Investigation Data  
Questionnaire and Results**

# 365 responses

[View all responses](#)

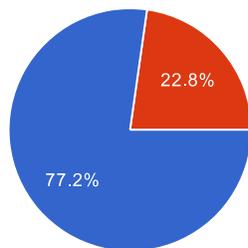
## Summary

What role do you play in planning, gathering, analyzing or using site investigation data. Please check all that apply.



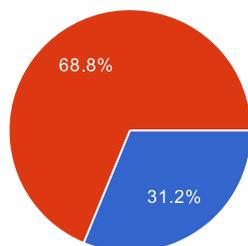
I plan site investigations.	<b>115</b>	40.6%
I gather field data.	<b>143</b>	50.5%
I analyze field data.	<b>155</b>	54.8%
I utilize field data.	<b>241</b>	85.2%

Do you see a benefit in creating a Reclamation-wide site investigation database as described in the opening statement of this survey?



Yes	<b>261</b>	77.2%
No	<b>77</b>	22.8%

Are you aware of any current database(s) used by your group/region?



Yes	<b>109</b>	31.2%
No	<b>240</b>	68.8%

If you answered yes to the question above, can you provide a brief statement about the type of database used, who the target audience is, and whether the database is managed by a group of persons or one individual?

The initial phase of implementation for this work has been started using the BOR GIS (aka Tessel) online GIS database. I think that having Geo-Referenced design data collections would be a huge benefit, and eliminate duplication of costs/efforts to collect the same data twice.

Reach 2B database by Kristi Seabrook, also GIS viewer by Patrick Wright

If a site existed: Various geological, geotechnical, and geophysical data is used in the design of structural features (i.e., powerplants, pumping plants, switchyards, buildings and Other structures). Target audience would be designers.

Excel spreadsheet Vs data

Network database with nested folders. Not very efficient for finding data.

HDB managed by UC Region

NA

Tessel Google Earth Both managed by groups of people.

MP Water Conservation Team has a database for grants, water districts, and water management plans, and annual updates

Hydrologic Data Base for the Colorado River. Used as a storage house for river data as well as a place to perform calculations for use in many reports.

Water Accounting Wells Bridges

AgriMET runs a weather station and ET estimate database. We also have UC HDB which stores reservoir and gaging data throughout the Upper Colorado Basin. LC HDB covers the Lower Colorado River Basin, and YAOHDB covers the Yuma area office operations.

We use an internal database that is open to public viewing but not editing. Oracle. Target audience is primarily MP Environmental Monitoring group and folks for whom we conduct investigations. The database is maintained by a group (3 data entry personnel, IT oversight)

We operate a moderately sized time series database for hydrologic information. It collect real time data from a variety of sources and use this data to drive decision support for our reservoir operations. Our database is called HDB and is supports reservoir operations, hydrologic modeling, web-based data portals and other agencies needing our operational data such as the National Weather Service. There are several instances of this database operating in different regions. Each region has tailored to database to meet the needs of the individual offices.

FRPP

GIS Layering of Projects

Each region has a geology-geotech library that contain numerous historical reports, logs and maps. Currently, Reclamation is dismantling all libraries in an effort to be "paperless". The libraries are used extensively by geologists, geotechs, designers and project planners. Management of the current libraries are collateral duties that fall to the work group or branch in which they reside.

Hazmat Databases - tracks hazmat audits All Appropriate Inquiry Reports- government records, federal, state, local Environmental Management System (EMS) - tracking aspects, impacts and corrective actions for the EMS program

typically, by the time I receive a project, it has already been designed. I have used soils data from USGS to evaluate Storm Water Pollution Prevention Plans. This type of data would be useful for us to develop for our sites, so we aren't re-inventing the wheel so to say for erosion control. It seems that we could establish the risk for erosion, rather than having the contractor determine the risk each time.

syd poulton of the mp region is the primary database and programming manager for reclamation. he would welcome being part of this project. he manages every major reclamation program.

There is a database, maintained in Denver for some of our field test results and our protection relay programming.

## Bridge Inventory

### SJRRP field database

Groundwater Measurements for the greater Yuma Area. Currently close to 1000 wells are measured on a monthly, quarterly or semi-annual basis. The data are used for management of groundwater in the Yuma area and are also posted to Reclamation Internet site for public use. These data are gathered, analysed and managed by a collective of about half a dozen persons. Groundwater measurements data exists for the Yuma area from 1911 to present.

I currently use our TESSEL site to look up land use data. I work as a Realty Technician and frequently respond to land use queries.

TESSEL is all I know about. Besides just asking around which is pretty useless.

Natural resource staff would find this database extremely helpful and improve efficiency to reviewing permit applications and NEPA analysis.

Multiple archaeological, cultural, environmental, and historic data bases like SHPO.

I believe archaeology in MP uses a database system for Native American and other archaeology issues.

The FRPP (Federal Real Property Profile) is in the FBMS database. This is a database that collects information on buildings and structures and is reported to the department as well as GSA.

PCQAS Earth and Concrete. One person manages this data input. This data is used to generate monthly concrete compressive strength report as well as compaction testing summaries for all areas where this testing is performed in the field and is combined to submit the data for a monthly L-29 report for any project that the Bureau works on.

### sharepoint

I created an Access database for the UC Region to collect access roads and parking lots at Reclamation recreation facilities. This information was used to apply for Department of Transportation funding to improve roads and parking lots.

eDRAWS contains project drawings (PDFs and AutoCAD files) that may be used to research structures and existing facilities. Engineers are the primary target audience. I do not know who manages eDRAWS.

### Hydrologic Database

Interagency collaborative program database; managed through a contract.

### dam safety

Access relational database for tracking projects. All of the group enters data. Primarily, one person (me) manages the data. Access relational database for NAGPRA analysis. Only two people use database. One person (me) manages the data.

Geospatial: Tessell (Reclamation) and ArcGIS (Reclamation). It would also be nice to integrate the CNDDB (CDFW), NWI (USFWS), local land info, and Corps mitigation site information.

LiDAR database, general audience, not sure

We use the NEPA database and the databases associated with Tessell for ITA and general location information.

### Tessel applications

We have various GIS databases that are managed primarily by myself (the GIS Data Manager). However the databases seem to be incomplete, as there are many hard-copy records that have not been converted into GIS, and updates are not always pushed to the GIS Branch.

data set is a structured file system that handles all records associated with a project including any communications.

LC Hydrologic Database - Lower Colorado Region employees and stakeholders. This database is managed by several people within the LC Region.

We work with a myriad of independent databases - and consolidation into a centralized system could be very helpful. We use operational data that is stored in our operational models, as well as in spreadsheets, and in a UC-Region system called HDB. WE also use weather data and snow data stored in various locations by various agencies.

CDEC - California water statistics database managed by the state. USGS also has a water statistics database that is commonly used. HAR - Central Valley Project operational database. This is managed within CVO, I think.

N/A

Maintenance and equipment files

I utilize field data on electrical systems which does not meet the criteria in the opening statement above. Therefore, my opinion is non-applicable to your investigation!

using gINT to organize drill and test pit information into logs that are then used for reports. Target audience is TSC and is used in specifications for features and distributed to contractors. The database is used by several individuals but not efficiently managed.

DAMS

Data Acquisition and Management System (DAMS), Dam Safety Data Management Systems (DSDaMS), Mechanical Equipment Database, Bridge Inventory, BORGIS Tessel, etc.

supervisors are the only ones that could permanently change the data, but everyone could write changes in a different color.

Data Acquisition and Management System (DAMS) - Houses all of the instrumentation readings at our facilities: <http://bordams.usbr.gov/dams/> Dam Safety Data Management Systems (DSDaMS) - Houses many of the reports related to our facilities: Dam Safety Information System (DSIS) - Database for all recommendations. Houses status report information, dam safety contact personnel, schedules, etc.: Tessell Dam Safety Geographic Information System (DSGIS) - GIS portal for inundation mapping information: [http://intra.usbr.gov/ssle/dam\\_safety/applications.html](http://intra.usbr.gov/ssle/dam_safety/applications.html) Mechanical Equipment Database - Houses gate testing information for our facilities: <https://mechdb.usbr.gov/MechDB/>

GIS Geodatabase used by Project Managers, Engineers, Techs. Managed by Engineering Tech.

CARMA DSIS

PN region has a budget database that is managed by one person (who's sold job is to maintain and manage the database). It is used to track program accomplishments, pull detailed financial and budget information, track budget formulation and execution and also assist the accountants in speedy report analysis.

just GIS data... GIS personnel also we set up a regional data base on Landslides... a couple of us manage it...

We need a GIS data base that gives information on the sites NEPA has been completed.

We have a GIS data base. We are creating a GIS data base manager position here in DKAO. The GIS data base is used by engineering, maintenance, operations, recreation, resources (natural & cultural), real estate and Right of Way.

Tessle

I do not use or would benefit from this database but I could see Reclamation benefiting from what is noted in the opening statement of this survey.

Zachary Nelson has a geodatabase of cultural surveys for the Provo Area Office.

EPA STORET handles water quality, biological and physical findings. Most investigations are conducted with appropriated funds and would be best placed in a place where they can be scrutinized by the folks that paid for the study.

YAOHDB

we all share FER documents and often talk about what data is needed from what explorations.

our office was working towards a unified database, but lost our GIS person. much of the data is collected by our technical services (engineering) division.

BOR GIS Tessel.

Anyone that request data from the MRG. Group of people manage it.

Project-specific GIS databases

There is a lot of information out there but it is hard to find it and know how and where to get it.

The SJRRP in the Mid-Pacific Region uses GIS as a database for project data

DSDams, Electronic Archive of Geologic Reports - Group Geologic Library on 10th Floor - Group

Data would be good when creating new designs and relating issues to dam safety concerns.

Environmental monitoring database Project Managers, general public Entry by a group, maintenance by one person

Hydro Database (HDB) - group managed within USBR. Target users are water operations planner/schedulers.

Yes, the DLS maintains a database of analyzed water samples for invasive mussels, water quality, water perimeters, etc. - it is managed in the Denver lab by the technicians there and utilized across Reclamation.

Geomorphic and hydrologic data of streams of interest used by geomorphologists and hydraulic and civil engineers. Data are managed by the GIS group.

ARC GIS. Construction, River maintenance, engineering, water ops. Our data base is local but it would highly benefit the USBR to have an Enterprise GIS server data base.

PD

Tessel, parcelquest, earthpoint.us. Although I find I have to go to other sources - various gov database sites, (county, state, fed that have different overlays). Long term ownership history is a major issue I run into, because often those are related parties who have documentation of amenities, grants, easements, facilities, right of way's, contract agreements, engineering, etc. Basically in the act of discovery, I realize that I may need additional information. Hard copy and digital files are set up. The information I gather is given to the project managers to help them in their jobs with determinations of scope of work.

I develop data collection forms for field use for conservation and rehabilitation of areas along the Lower Colorado River. All of this data is GIS based and is used on a daily basis.

Utah Geologic Survey has been working on a wetland mapping project, and EDDSMaps is a nationwide mapping effort of invasive species.

I use file geodatabases and enterprise geodatabases (ArcSDE) that are proprietary GIS databases created by ESRI and contain spatial data files for the GIS division and select staff in several divisions. ArcSDE is managed by a database administrator within the GIS group and file geodatabases are managed by both groups and individuals.

Reclamation's Hydrologic Database (HDB) is used by Water Management/Water Operations for daily operations and modeling. I think it is managed by a group in Salt Lake City, UT. We also use data provided by the US Army Corps of Engineers in HEC-DSS format through WinSCP FTP.

I use file geodatabases and enterprise geodatabases (ArcSDE) that are proprietary GIS databases created by ESRI and contain spatial data files for the GIS division and select staff in several other divisions. ArcSDE is managed by a database administrator within the GIS group and file geodatabases are managed by both groups and individuals.

I don't have a role in GIS data.

Our Area Office gathers data from existing data bases in GIS form and puts together exhibits for presentations and planning teams. We are in California and have access to most stgatawide data bases as well as other Federal agencies. Our region also has a GIS data base for certain things. I do not believe

Reclamation needs a complete one shop data base location. When Denver helps us on field work we provide them with the appropriate data sources for each effort. Our main concern would be the cost of setting up, populating and maintaining such a data base. We do not need to incur additional charges for a service we may use only once or twice a year. The other concern we have is that having worked in three different regions and Washinton HQ, consistency of the type mentioned are very variable. I don't know if LC Region would have a need for GP or PN Region information. Maybe the effort should be to encourage regional offices to set up or organize a site investigation data base for their area of operation. The information across regions is more consistent than information across Reclamation. Each region has unique characteristics not found in other regions..

Realty staff has paper data electronically stored through our GIS team in Tessel.

The Water Resources Group at Eastern Colorado Area Office utilizes HDB (Hydrologic Database) for storage, computations, and retrieval of water and meteorological data. Data from HDB are made available to the HydroMet database at Great Plains Region.

DSDams- hard to find items quickly Meridian - nearly impossible to find reports

PRIS and DSIS

Water Sage <http://www.watersage.com/>

DS dams website has old reports that I use - seems like they just changed the format to where you now need permission to access the site.

TESSEL is used by ESO to keep track of the condition of field structures

No databases that are not used Reclamation wide

Because there are so few Land Surveyors in Reclamation, other than certain reports to TSC in Denver, each individual, or group, appears to have their own database for their own use. I am an "individual" one person survey group, and my data is stored for my own use, and for historic records.

Where - eDRAWS (CAD Support) What - AutoCAD Drawings, surfaces, survey data, photographs, reports, etc. Who - Engineering Support, Geology, Construction Management, etc.

We have a contracting database that our internal GP regional contracting staff utilize to ensure we are effectively performing contract administration.

There is a database that was created for the Pojoaque Basin Regional Water System that is currently in the late planning stages. It is limited to a small area and is not for general use.

I don't have enough information to have an opinion, yet.

Tessel.

CDEC

The PXAO GIS group manages a database of information. They are working to compile all of our information into the database to actively manage the information.

U.S. Department of the Interior (DOI) Office of Policy, Management and Budget (PMB) Environmental Management Information System (EMIS). EMIS is a web-based database application managed by the Office of Environmental Policy and Compliance to track and manage data for both the Environmental and Disposal Liabilities (EDL) and the Central Hazardous Materials Fund (CHF) programs. The EDL module allows the Department to ensure EDL recording and reporting consistency among bureaus and to track changes in its liabilities. The CHF modules allow the Department to keep track of its mid - to long - term cleanups. The ER module allows the Department to distribute and archive environmental review (ER) assignments to bureaus. ER assignments may be viewed (read only) without logging in by clicking the "ER ASSIGNMENTS" tab.

The Trinity River Restoration Program has various local databases in various states of development, plus an online data portal that provides access for collaborators to some of these. One database does specifically address soil test pit locations and groundwater data from within them.

There are a number of commercial databases available and some locally developed ones such as HydroGeoAnalyst and input data structures for GMS. Aquaveo also assisted with the development of ArcHydro Groundwater which is a database framework for the collection of groundwater related data. In Sacramento Jon Goetz (GEI Consultants) developed a very useful database tool called SHEDTOOL that had many of the same features as HydrGeoAnalyst.

Southern Rockies LCC uses the USGS ScienceBase database for storage, cataloging, and retrieving all data acquired or developed with LCC funding.

As a Natural Resources Specialist, I frequently use the California Natural Diversity Database (CNDDB), operated by the California Department of Fish and Wildlife. It is intended for biologists and natural resource specialists that analyze the effects of projects on state and federally listed species. It is a statewide GIS-based record of known (reported) occurrences of species of interest.

We have a roads Access database that has just been created for asset management purposes and funding opportunities through Federal Highways' Federal Lands Transportation Program. The database is in its infancy, but eventually will include condition information. In addition, we're just beginning to develop an Access database of recreation facilities with geolocations and condition. Right now, all of that data is in a spreadsheet that needs to be proofed for accuracy before being converted to Access. The Recreation Use Data Report is a database maintained by the Denver office that has limited statistical data for use in congressional inquiries; however, we've modified the basic form to include condition of the assets and photographs of the assets.

Just registered for the following: <http://usbr.maps.arcgis.com/home/> Our field office keeps local data.

It is an MS Excel and Access database that is filled with hydraulics for the facility (daily hydraulics measurements).

dataspace, GIS for land acquisitions.

DSIS, CARMA

HDB Hydrological Data Base. Used primarily on the Upper & Lower Colorado River basins. Audience: Water Operations, Water Accounting, Modelers and other interested parties.

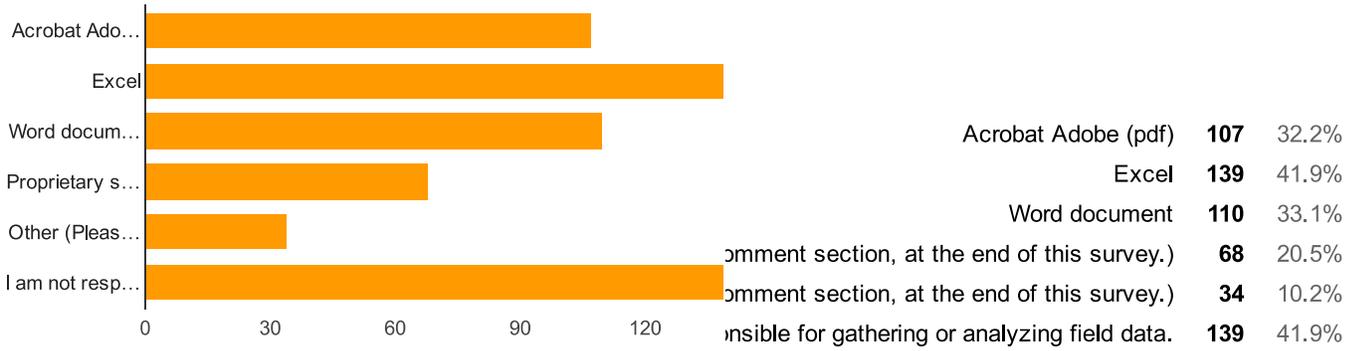
The Mid-Pacific region is investigating developing a site database, currently we are developing two separate site database that are activity specific. These are in the beginning stages of development. Their purpose is to collect ancillary field data. Better described, these collections are additional information collected when performing field visits. These data are collected using Survey123 or ArcCollector or Trimble GPS.

Reservoir evaporation data from S&T funded research projects is used as case specific indication of evaporation at Reclamation reservoirs. Used by reservoir operators to calibrate operations models. This data is collected on a per project basis by the TSC (Mark Spears).

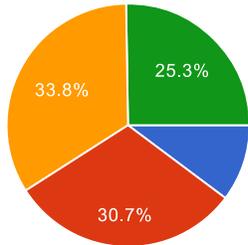
limited knowledge of GIS database. Used by land branch for special use permits and maintaining a database of special use permits where they are located in the field. Unknown whether the database is managed by a group of persons or one individual.

It is a GIS database the target audience is anyone. managed by our GIS people.

**If you are responsible for gathering or analyzing field data, what format is the data reported in?**

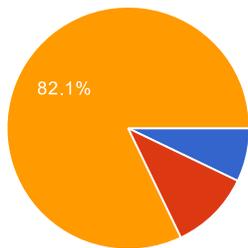


**If you are responsible for gathering or analyzing field data, do you use a standard reporting format?**



Yes, we have rigorously developed a standard reporting format that we adhere to.	30	10.2%
Yes, but the standard format is subject to change.	90	30.7%
No	99	33.8%
I do not know.	74	25.3%

**As a planner and/or user of site investigation data, would you be willing to fund the effort to gather, organize, and manage a database.**



Yes	24	7.1%
No	36	10.7%
I do not have authority to approve funding.	276	82.1%

**Additional Comments: Please provide your region and/or work group information here. Feel free to add any additional comments you may have.**

I really like this idea...and think it could save significant costs.

Software: gINT, RockWorks

Funding provided/sued would be project funds for initial gathering of data but not to manage a Reclamation-wide system. My understanding in the future eDerms (spelling) would be such a database system, but would require some sort of historical means to populate the system. Great idea! Proactive.

GP Region Geology and Exploration Services For many years we have wondered why Reclamation does not utilize a GIS database for geologic data.

Recommend that the GIS database be ARC query - able. thx! good idea :-)

I think this is a great idea! River Analysis Group of the Technical Services Division of the Albuquerque Area Office

GP-2600

ACCESS database

Pisces, POET, uchdb/lchdb and other Regional instances of the Hydrology Database System

NA—I do not work with GIS field data

I don't have anything to do with any data obtained in the field for Reclamation use, to include survey data, soil boring and/or test pit logs, well logs, geophysical data, etc. This database would have a GIS component with the capability to perform detailed query searches and spatial statistical analysis. Therefore, the only way I can answer these questions is: n/a.

I do not use site gathered information as described.

Central California Area Office in the MP Region.

I would have to see more specifics on the proposal in determining whether I would approve any of our funding for the project; however, I think the overall idea has merit.

Unclear what is intended for the definition of Reclamation site investigation data. Region-wide on-ground surveys were made of lands focused on potentially unneeded lands, with extensive discussions of resources and management. Inventories are made of recreation resources for management planning. Water is accounted for in various ways. Recreation use is occasionally tabulated for particular purposes, such as for fee collection, or counting whitewater boats and boaters by viewing an online photo site.

My job does not require these types of information.

Mid Pacific Region Construction Office

I am a GIS employee. There is so much data that could be utilized and is not currently being managed or utilized properly. This would be a great thing.

HDBpoet was developed by the PN region. We can also assess HDB via a web interface tool

We used to use a standard reporting format but our investigations are diverse and the standard format was not helpful. Excel provides us with needed flexibility.

MP 730 (Planning Division) I would be willing to provide a small amount of funding as part of the close out of site investigations to fund this work. However, providing funding for past site investigations will be very difficult due to funding limitations.

Montana State DNRC has a intra-department GIS based geospatial database known as GWRAT which encompasses aerial, topographic, Montana GWIC ground water wells , PLSS, Montana Water rights centroids and polygons, and more. Great tool for them.

Mid-Pacific Region, Division of Planning; also Central Valley Project Improvement Act

ArcGIS and Survey Collector

Stevan A. Raye Environmental Protection Specialist Ecosystems Analysis (Regional HazMat Coordinator)  
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Typically the contractor prepares the plans, but our designers can also collect the data. In the end, our construction contracts document the data.

The field data that I deal with most is survey data. We use various programs to record and use survey data. Mostly we use Autodesk products and Leica products. The Leica products we use are Captivate, Infinity, and Cyclone. The Autodesk products we use are Civil 3D, Recap, and AutoCAD. We use Excel to produce .csv files to import data into Autodesk products.

I would use some data about the dam and power plant structures at times. I would use data about mechanical and electrical systems, including AutoCAD drawings, often. We use software developed by the the manufacturers of the electrical protection devices (SEL) to store and access our programming information. This allows us to share with Denver and other sites.

We document graphically with Auto Cad Drawings so in many ways a dbase would double the workload. However, Geo-referencing our drawings within GIS seems both a worth while and reachable goal. Hell, we'd even be like most everybody else then!

Data is stored collectively in several formats to include spreadsheet, database, hard copy paper and GIS formats. Mapping products made from the data are stored in GIS, Surfer and Acrobat formats and are served to the public in Acrobat documents on our Internet site.

#### AUTOCAD

Department of Interior Great Plains Region Eastern Colorado Area Office Loveland, CO

Mid-Pacific Construction Office. Your question "If you are responsible for gathering or analyzing field data, do you use a standard reporting format?" should be multiple choice since design data can be collected in many ways with many expected formats.

I do not plan, gather, analyze or use site investigation data.

I would advocate for funding in this effort even without the authority to approve funding. Biology information is not cataloged well within Reclamation. So much so that institutional knowledge is used to spread word for ESA reviews on species within project areas.

Proprietary software (Please state software name in the Additional Comment section, at the end of this survey.) PCQAS Earth and Concrete.

#### CSV

I think the biggest problem is to keep the data current.

#### Access

#### MP Region

I do not typically deal with site investigation data. If I were to deal with that data, the data would be part of a report I edit as a technical writer/editor.

Data formats also include exports to ESRI shapefiles and CAD drawings.

MP Region, MP-152, Environmental Compliance and Conservation Branch.

Other software includes: TNP, GoogleEarth Pro, ArcGIS and AutoCAD

We also use site investigation data to run models for air quality analysis. Because our group is direct funded by those programs or projects we work on, we do not have additional funding that could be used to support development of this tool.

The Provo Area Office has discuss this very issue of developing a database of survey information, infrastructure, geology and drilling information. We are looking at getting the information into a GIS format, but would be interested in seeing what else is being considered.

Phoenix Area Office GIS Branch. I think it is a great idea, and something that is needed Reclamation wide. There is a vast amount of information in general in digital and hard-copy formats stored in various locations. The usefulness of all of this information would be greatly improved if consolidated into a GIS Database that can then be used to easily locate and analyze the information. The challenge is making it a priority, and obtaining the funding to complete such an effort.

The type of data we store ranges from phone messages to survey data to documents to modeled data.

Riverware is the modeling software, and the database is an Oracle product.

UC Region, Albuquerque Area Office, Water Management Division. Groundwater data that I work with often comes in a format developed by the datalogger manufacturers (Solinst or In Situ). I am also working on development of a comprehensive database in SQL format for the Rio Grande Project.

I do not plan, gather, analyze, or utilize any filed data.

My database is all on Indian lands, and you would need the permission of the tribes to include it in a database. They're not likely to provide it. As far as funding it, since my funding is not guaranteed from year to year, I probably couldn't help with it.

This does not apply to my position.

MP-200 Site Investigation is not applicable to my field; although, it may be applicable to co-workers.

I work for MPCO as a construction control representative. I assumed this position following approximately 20 years as a staff geologist, laboratory technician, and inventory clerk.

ArcMap is used to analyze survey data for use in Special Use Permits and trespass resolution.

UC Region Geology Group gINT I am an advocate of relevant, standardized data collection and reporting. I can suggest funding be provided to accomplish this goal

ArcGIS, AutoCAD

None of these apply to my job.

Don't know if it would include things like hazardous contaminated sites, fuel storage tanks above and below ground, STP's, gravel pits/quarries, etc.

Great Plains Region Montana Area Office MT-400

Many online databases exist that are valuable in collecting data before a site visit. Ensure this one is not redundant and also keeps sensitive information safe. TWDB keeps well log records currently on their site in a sensitive, but open information way that is worth using as a template (<http://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer>).

Great Plains Region. I also use ArcGIS and AutoCAD to analyze and display field data.

ArcGIS Geodatabases and ArcMap are in constant use with the AAO Pojoaque Basin Engineering Group.

InspecTech software

As an accountant, I gather and analyze financial data and power usage from the field. My use of field data is not investigative but more for reporting and bill preparations.

MP region SSCAO I perform maintenance on data loggers for river and ground water monitoring. Data pulled from loggers in a text file as can be opened by Wordpad. The Operations division may have a database, not sure.

GINT

Your first question should contain the "I do not utilize field data".

AutoCAD, Trimble

UC Region While I feel a database is useful. There is a significant effort involved in creating the database, but I feel the most difficult is in maintaining the database. An easy to use database - both for querying and for uploading is necessary.

I use ArcGIS to spatially locate my surveys and Microsoft Word to record data. Zachary Nelson, Provo Area Office

Again, we have been placing our data in EPA STORET for multiple decades (at least early 1970's). It seems disingenuous to reinvent the wheel for something that is already available. A plethora of different databases only leads to investigators not having access to data that has been paid for by public funds at their disposal.

I believe the last time Denver tried this approach was late 1990's. After USGS came up with their "own" database.

This proposed database would be very complicated and most likely not always reflect the effort or documentation required to provide the data. Simple explorations would be documented, but often explorations are dynamic and sometimes data collected does not fit the method used. Geology does not fit well into boxes.

I do not have any authority or planning ability

Upper Colorado/AAO

gINT software on a very basic level. Only used for creating geologic logs and well diagrams.

I do not have a role in gathering or organizing this type of data.

we use gINT for our logs.

The other is AutoCAD or Civil 3D. Why is it not on the list? If photos count as field data then I also gather field data.

Bryan Simpson, TSC Geology Group

Data is manually transcribed from physical copies of field sheets, chain of custodies, and laboratory reports.

HDB-POET: hydrologic database. Field instrumentation measures various hydrologic parameters which is electronically recorded into HDB for review, assessment and use by USBR staff in everyday operations.

The data is usually topographic and bathymetric survey data in \*.csv files.

Google Earth Pro. I think this is a great idea, much overdue and needed, and please include environmental data such as endangered species, habitat restoration projects, cultural resources, etc. Thanks!

Enterprise GIS is used by all other DOI offices and I can not communicate our data with them. It is critical for data collection in all aspects of the USBR from lands and reality to engineering for us to have this capability.

Lands division, Fresno

All data is reported in annual/individual reports using MS Word and then placed into PDF. To QA/QC the data, we use Trimble Pathfinder Office. To collect (most of) the data, we use Trimble's TerraSync and their data collection units (Junos for the most part). We also heavily use MS Access and SQL for our databases. For GIS, we use ESRI software. MS Excel is used to some extent for analysis.

This database needs to include biological field data on fish and habitat as well so hydrologic, geophysical, climate and other biological data can be tied together to explore and understand relationships among all.

I map invasive weed species on the local level in ArcMap 10. I used to collect piezometer readings for ground water level, but that data was not used, so we stopped collecting it.

I am a Construction Inspector, utilizing field data gathered by others prior to Contractor's activities on site, and gathering field data obtained by Contractors during the construction activities.

I am a GIS Specialist within the Lower Colorado Region at the Phoenix Area Office. In my opinion a Reclamation-wide site investigation database that has a GIS component would be highly beneficial.

Centralizing this information could provide a comprehensive resource across Reclamation that has potential to enhance business decisions. I cannot comment any further without more details about how this will be executed or implemented e.g. workflow and delivery method. I could assist with the effort to gather, organize, and manage databases or consult on the subject pending my work availability if those services are in need.

UC WCAO LANDS/RECREATION GROUP

We use Crystal Reports, RiverWare, HEC-DSSVue (proprietary), HDB-Poet, Pices2

I am a GIS Specialist within the Lower Colorado Region. In my opinion a Reclamation-wide site investigation database that has a GIS component would be highly beneficial. Centralizing this information could provide a

comprehensive resource across Reclamation that has potential to enhance work efforts and business decisions. I cannot comment any further without more details about how this will be executed or implemented e.g. workflow and delivery method.

Gathering existing data into one place has some benefit, but there is no substitute for site-specific data related to a particular activity. As an agency, we have largely abandoned our traditional design data gathering efforts and we pay for it over and over in contract modifications and delays. Also, assembling data obtained by different individuals over many years introduces the possibility of geospatial reference confusion - which datum was used, which coordinate system was used, etc. Database site data is only of value in final design if it is properly referenced by qualified surveying personnel.

Data is reported in inspect tech for bridge inspections. I take that information and calculate a load rating. There is no program to put the load rating information into.

The closest area of work to your question above about format is the requirement for formats in final basin reports and other reports under the Water Smart program. We work with over 150 different water districts and they all provide data to us and we can ask for a certain format, but generally we type what they provide.

We gather a lot of elevation data (topography) and although it comes in as Excel we convert to GIS shapefiles and never use the excel again. Those shapefiles are not standard and there are many miscellaneous types of data.

The ability to automate, or at the very least streamline the acquisition and maintenance (probably the more important of the two) of data would: significantly increase productivity of those that use it by making us more efficient in accessing reliable data and generate more creative and thorough solutions to situational problems

Water Resources Group, Eastern Colorado Area Office, Great Plains Region Data are made available for analysis in HDB Poet, TSTool, and also reported using various software, such as Crystal Reports and MS Office (primarily Excel and Word). Our hydrologic monitoring program (HyMoP) has nearly 100 gaging stations, using GOES telemetry to transmit stream flow and reservoir water surface elevation data in support of the Colorado-Big Thompson and Fryingpan-Arkansas projects. Tim Miller is our administrative contact for our HDB (hydrologic database) and Victor Lee and Stephen Middlekauff oversee the HyMoP. James VanShaar can field questions related to possible funding.

GP Region We use Gint for logs - hard to use

LC Region Power Plant No value to us.

I'm responsible for field data associated with environmental concern (threatened & endangered species, soil type, vegetation cover, air quality, water quality, wetland delineation, etc.). The reports produced are National Environmental Policy Act documents (CE, EA, or EIS), Clean Water Act - wetland delineations/pre-construction notices, Clean Air Act, and Endangered Species Act (biological assessments and survey reporting forms).

vertex cptsound

I could definitely see the use in a project specific database. Reclamation's current filing system is not ideal...

I was out of the office on Wednesday and Thursday the 14th and 15th and just received your message this morning. Brantley Jackson NKAO Archaeologist

Trimble Software: Trimble Geomatics Office (TGO) & Trimble Business Center (TBC); AutoCAD Civil 3D Hard copy files.

Most of the data we collect is for the Dam Safety Office - and funded by DSO. The UC Drill Crew reports through me. I have been planning to do something like this will all of the new (and old) data we collect/have collected. I would be very interested in being part of the conversation related to this development. Bart LeeFlang - 801-230-1284 - Manager, Field Engineering Division, Provo Area Office, Upper Colorado Region.

Lower Colorado Region, Engineering Services office, Civil Engineering group. I use AutoCAD to analyze survey point data and use point data, lidar data and contour data to create digital terrain models in AutoCAD.

I am an archaeologist. I do collect (or have collected) these type of data. But, most of this information is Quaternary aged soils and anthropogenic sediments/modifications.

Not applicable to me.

AutoCAD Civil 3D

We need a common database, not only for the uses you've stated, but for archaeological, environmental compliance, permitting and realty. This is long, long overdue.

Custom formats and Aquatic Infomatics records processing system.

BOR geologists produce excellent reports. If this provided better access to these reports, it could be beneficial.

Lower Colorado Region, Power Group

Data Format is primarily .CSV (comma separated values)

GIS Google earth

ESRI ArcGIS/ geospatial data, LiDAR, airborne imagery

Jeffery Smith Regional Hazmat Coordinator Bureau of Reclamation Lower Colorado River Region Resource Management Office Environmental Compliance Group

I am an admin assistant.

I'd be glad to share what we have done and advise on broader database development. [ebpeter@usbr.gov](mailto:ebpeter@usbr.gov)

This sort of thing has been attempted in the past and failed due to lack of long-term support and training of individuals responsible for field data collection. A wise strategy might be to embrace the use of a commercial software tool Region-wide - avoiding the risk of losing expertise and the entire enterprise.

Interested in a system to manage geotagged photos.

Byron California - Tracy Fish Collection Facility

terrasync and pathfinder for trimble units for land boundary and initial site assessments.

Proprietary software: gINT

Proprietary software on Server to Oracle DB to HDB DB. My own expertise is in the field collection end. Sensors, Data Loggers & Telemetry. Data Transferred via Radio and/or IP links. However see the need for standardization in the measurement and collection (logging) processes. Also standards in the data format to be inclusive for observed field notes and other forms of metadata. Sooner or later -- some standards will have to be discussed and adopted. Otherwise, we're working on "The Tower of Babel"... DGunderson

Mid-Pacific Region MPGIS

Other software: Autocad DWG

### Number of daily responses

