



2015 Exploration Information Management Report

“85% of respondents rank data management as a critical or a top five issue for their exploration group”

Contents

Executive Summary	3
Introduction	4
Survey Statistics	5
Q1. For your organization, where does “data management” rank as an issue?	7
Q2. How do you primarily manage your drillhole and geological data?	9
Q3. How are you primarily managing your geophysical and other geoscientific data?	11
Q4. Considering the variety of data types in your company, rank what you feel is the importance for their management/organization.	12
Q5. What is your biggest challenge with managing your exploration data?	15
Q6. Does your organization face challenges resulting from having a large amount of historical or legacy exploration data to review and manage?	17
Q7. What is your organization’s biggest challenge when collaborating on active exploration project data with others?	19
Q8. How much time do you feel your organization’s geoscientists spend on data management tasks?	20
Q9. Given the many different exploration datasets within your company, do you feel confident that your organization has a handle on the following items?	22
Q10. Of the following concerns, which is the most important to you when thinking about maintaining any data management solution?	23
Q11. What would be your preferable approach to solving your exploration data management challenges?	24
Q12. What is the most important outcome that you would expect from resolving data management and accessibility issues?	25

Executive Summary

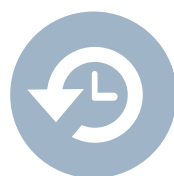
Though exploration data quality is improving, organizations continue to grapple with historical and duplicate information, collaboration in real time and the cost and complexity of data management solutions. The 2015 Exploration Information Management Survey identified ongoing challenges with respect to handling exploration data and how organizations are working to solve these issues.

The 2015 survey garnered almost 2,000 responses from 1328 organizations globally. 85% of respondents, regardless of their role or organization, rank data management as a critical or a top five issue for their exploration group. Organizations are becoming more confident about the quality of their data, but concerns remain about accessing and handling historical and duplicate data, and collaborating with others for the best results.

This report outlines findings from the 2015 Exploration Information Management survey including these key themes:



Approaches to data management differ significantly by industry.



Managing and accessing historical data is a major challenge.



Collaboration is emerging as an important theme.



Data management is seen as inefficient and time consuming.



Cost and complexity remain obstacles in data management.



Discovery and transparency of data are desired outcomes.

Although almost half of the respondents lament the time it takes to manage their data, the cost and complexity of implementing a solution dissuades some from taking further action. The majority of respondents would prefer a commercial solution to their data management challenges, whether that be in-house or cloud-based. In return, survey respondents expect higher discovery rates, improved transparency and lower costs.

Prepared by:

Steve Randall and Natalie Green, Geosoft Inc.

Introduction

In March 2015, Geosoft ran the third Exploration Information Management Survey. Building on our 2013 survey, we chose to broaden the 2015 survey to include more user roles and organizations from different industries and institutions.

Our approach is a simple survey, now including 12 questions, which provide insight into:

- The key data and information management challenges.
- Who is involved in managing these challenges, and who is impacted.
- How organizations are working to solve these issues.
- What are the outcomes organizations expect solving these issues would have on an organization.

This year we expanded the survey with 2 new questions as well as some new response options based on comments from the 2013 survey. These new questions provide insight into:

- The biggest challenges faced when considering historical data.
- The biggest challenges faced when collaborating on exploration project data.
- How organizations are working to solve these issues.

Survey Statistics

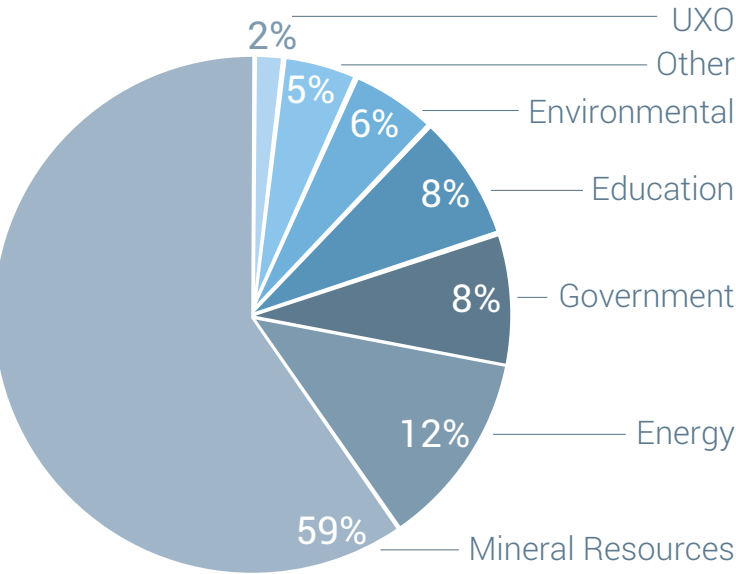
This year's survey was responded to by a much broader global audience, with participants from over 115 different countries. In total we received 1980 responses from over 1328 organizations and their subsidiaries around the world.



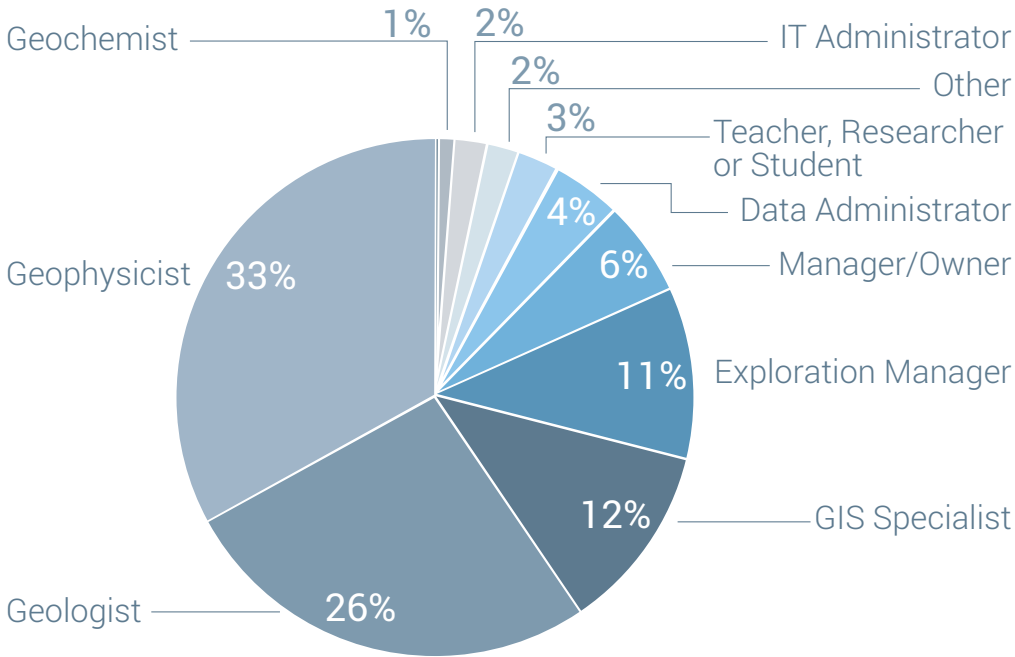
Survey Statistics

The survey was distributed to a wide range of roles within exploration companies, government and education organizations, and service companies involved in exploration. The 2015 survey saw a stronger representation from geologists and GIS specialists over previous surveys. Geophysicists, geologists, and GIS specialists represent 70% of the survey respondents with exploration managers, data administrators, and executive/managers representing the remaining 30%. Of interest, only 4% of the responses come from data administrators, down from 9% in 2013.

By Industry



By Job Title



Q1. For your organization, where does “data management” rank as an issue?

Across the board, managers, administrators, and all related respondent groups concurred that data management is of critical importance, with over 48% of respondents seeing it as such, and another 37% regarding it as a “top 5 issue” for their group or organization.

Statistically, no one role sees the issue differently than their peer roles, implying that the concern is felt evenly throughout the organizations surveyed. These results are consistent with our 2013 survey results, even though the size of the survey and the roles that responded have expanded.

Ranking of Data Management as an Issue

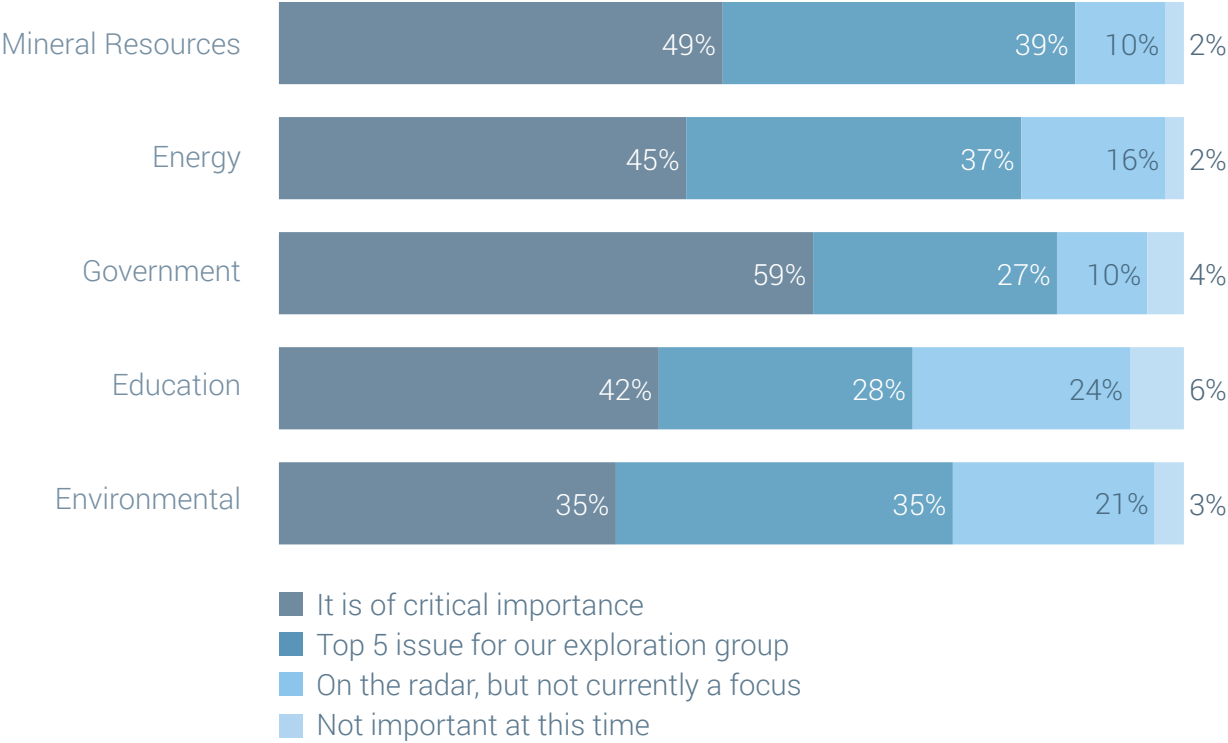
	2013	2015
It is of critical importance	44%	48%
Top 5 issue for our exploration group	38%	37%
On the radar, but not currently a focus	15%	13%
Not important at this time	3%	3%

We further analyzed the responses to examine how different industries perceived the challenge of data management.

Compared with other industries surveyed, more respondents from government organizations identified data management as critically important. In contrast, educational and environmental organizations ranked this least important.

The remainder of the survey seeks to explore the ways in which data are managed, and the challenges that lie in maximizing efficiency.

Ranking of Data Management by Industry

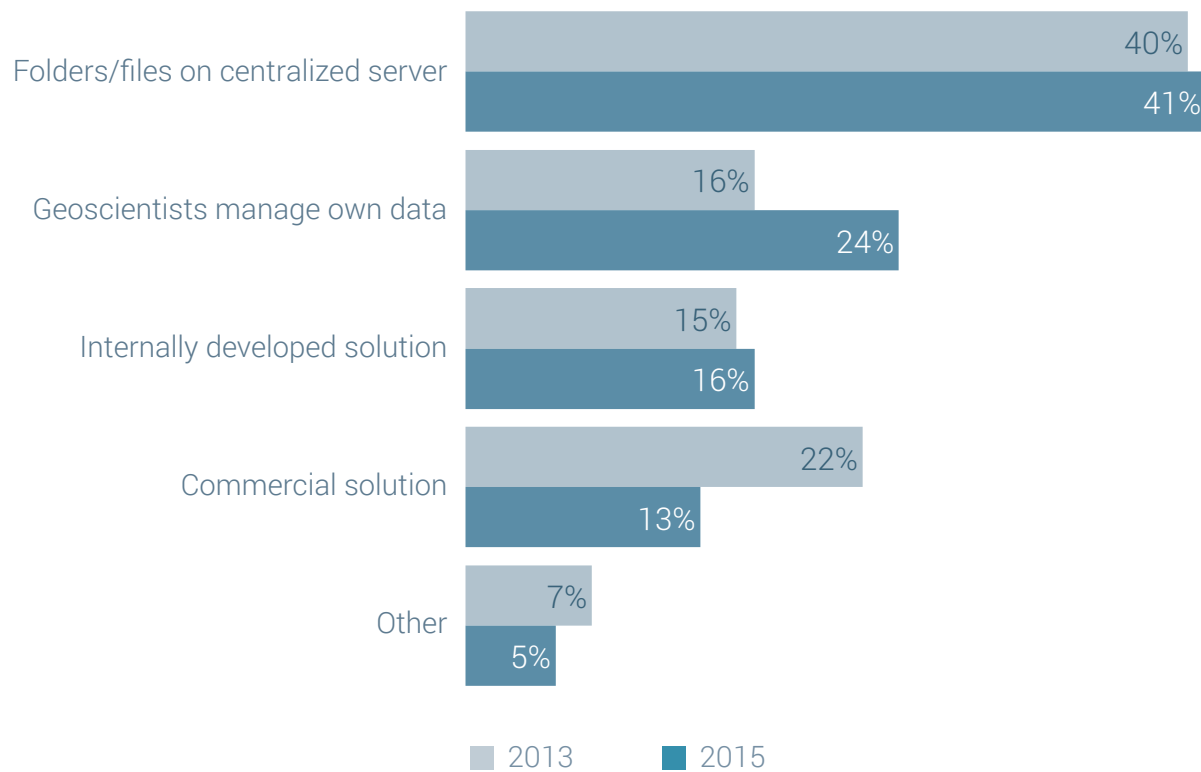


Q2. How do you primarily manage your drillhole and geological data?

The vast majority of respondents manage their drillhole and geological data via a folder/file structure on a centralized server. In comparison to 2013, more organizations rely on their geoscientists to manage data than using a commercial solution which was the second biggest category in 2013, but dropped to third in the 2015 survey.

Organizations that use commercial solutions, also had a higher response from individuals that noted their roles as data managers. They see the benefit of having these roles within their organizations when they have invested in commercial solutions.

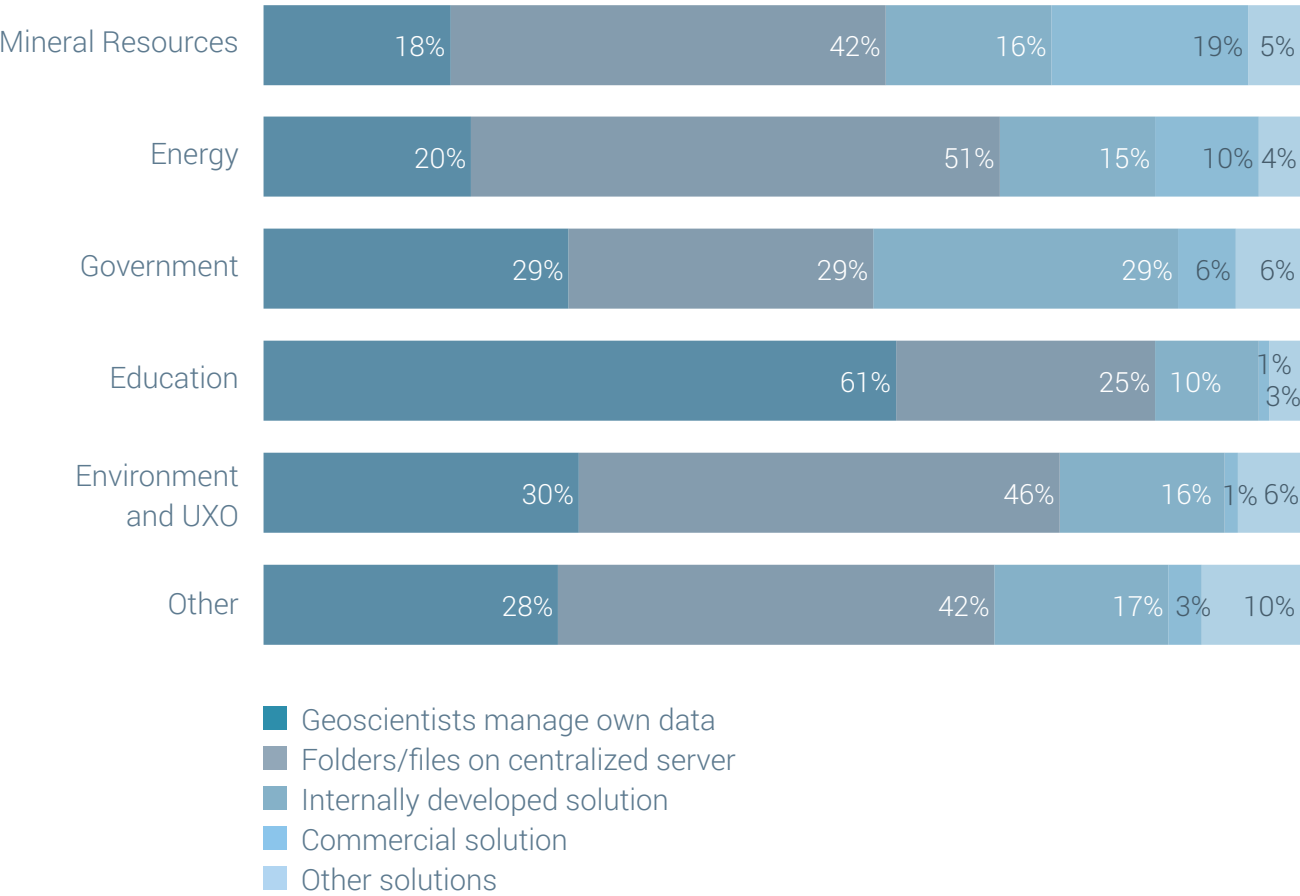
Management of Drillhole and Geological Data



Government and education organizations were the lowest group reporting use of commercial solutions. Instead these groups had the highest reliance on geoscientists managing their own data (45%). This in itself may not be a surprising fact for education, where budgets may not exist for commercial solutions, but for government this seems high given that many of these organizations have a mandate for publishing data.

A large number of respondents commented that they used combinations of these approaches within different projects/regions. The comments also illustrated a highly fragmented approach to the management of drillhole data, with over 40 different commercial solutions noted along with internal solutions built upon relational database technologies.

Management of Drillhole and Geological Data by Industry

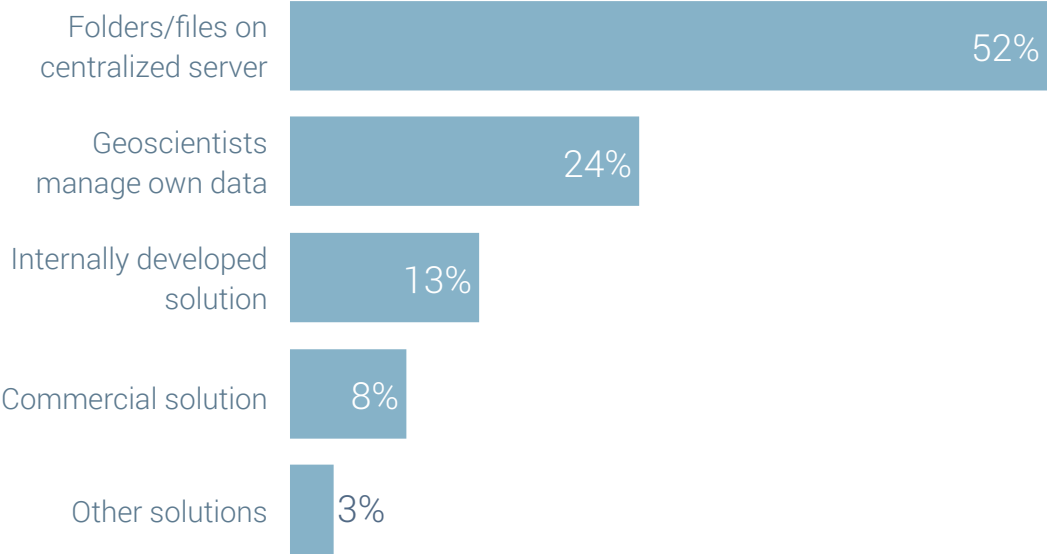


Q3. How are you primarily managing your geophysical and other geoscientific data?

Half of the respondents use a centralized server to manage their geophysical and other geoscientific data. This year, with the expanded survey, fewer respondents reported the use of commercial solutions. Both government and education organizations rely heavily on their geoscientists to manage their own project data, as seen with how they manage geological and drillhole data.

Also similar to the geological data management, responses from data managers correlated to the use of commercial solutions within organizations, reinforcing the principle that those using commercial solutions are also investing in roles to support these solutions.

Management of Geophysical and Other Geoscientific Data



The responses to **questions 2 and 3** were found to be highly correlated. Organizations that rely on their geoscientists to manage this geological information, tended to also rely on them to manage their geophysical data in similar fashion, with some exceptions where some organizations have a commercial solution for geology but geophysics is on the server. Correlation for the other solution types also appear correlated, though to a lesser degree.

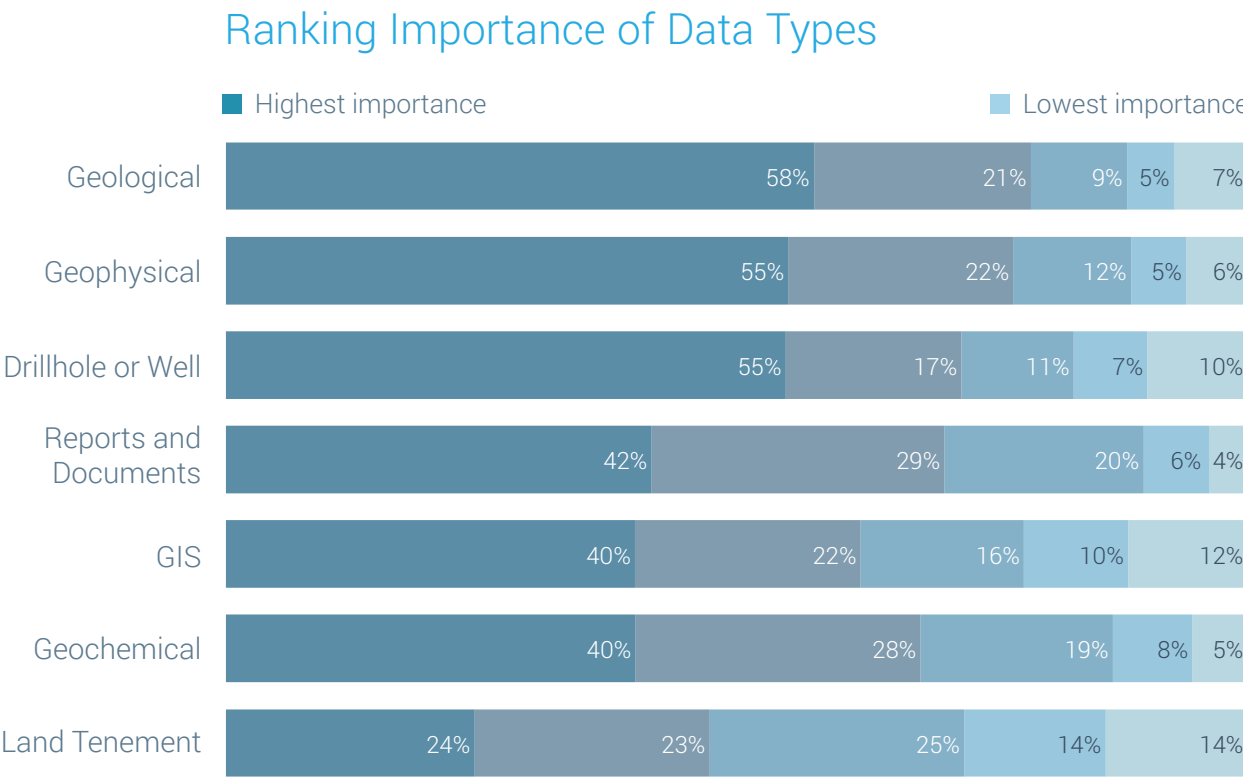
A secondary insight is that organizations where “Each geoscientist manages his/her own project data separately” for both geological and geophysical data were more likely to consider data management as “not currently a focus” or “not important at this time”. While, organizations that “use a folder/ file structure on a centralized server” were more likely to consider data management a “critical” or “top 5 issue”.

These insights could in part talk to either the size of the organization or their maturity of data management solutions, and based upon our experience, this mirrors what we see within many of the organizations we work with.

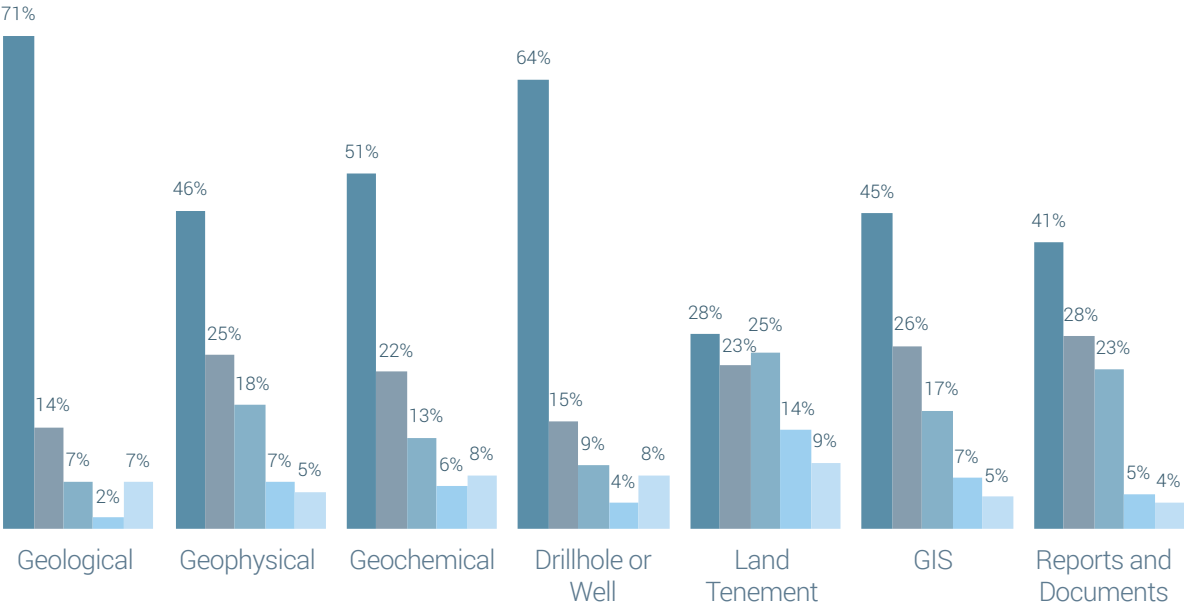
Q4. Considering the variety of data types in your company, rank what you feel is the importance for their management/organization.

In the 2015 survey geological, geophysical and drillhole or well data types were noted as the most important data types to be managed within the organization. There is consistency in results from our previous surveys, and the shift in the number of responding roles does not have an impact on this overall distribution.

As with our 2013 survey, land tenement data ranked as the least important exploration data type, though this remains a user profile that is under represented within the survey. In support of this, analyzing the response by role shows that executives and exploration managers place more significance on this data than other roles represented in the survey.



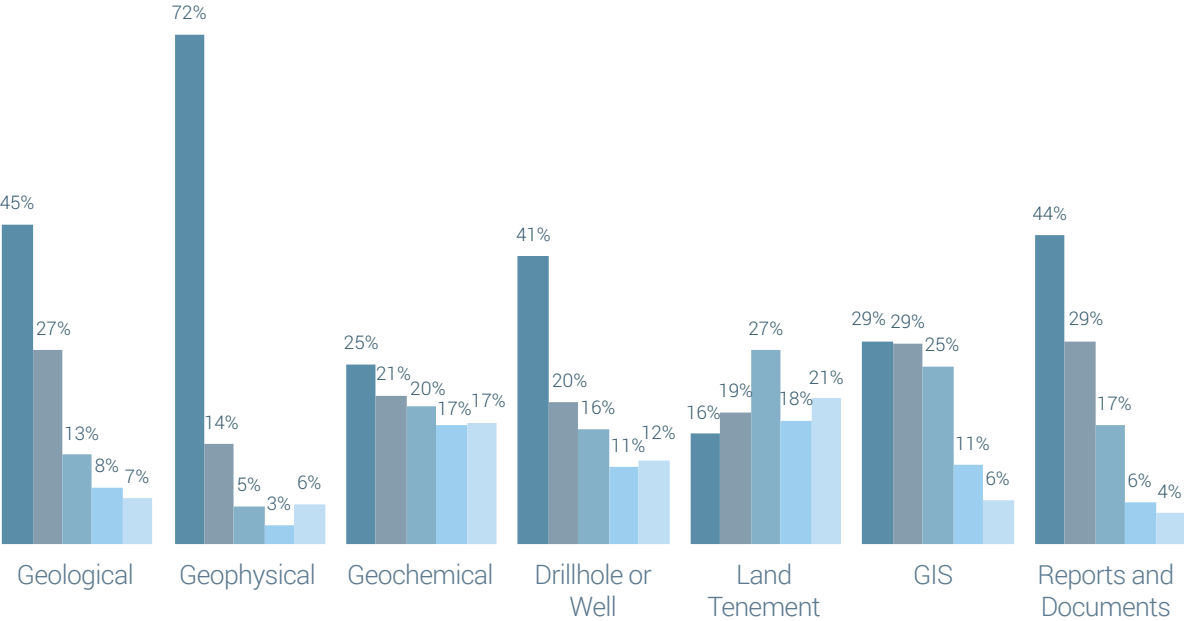
Geologists



When reviewing this from the perspective of role, specialists tend to rank the data of their domain as the most critical. For example 71% of geologists ranked data management of geological data as critical.

- Most important
-
-
-
- Least important

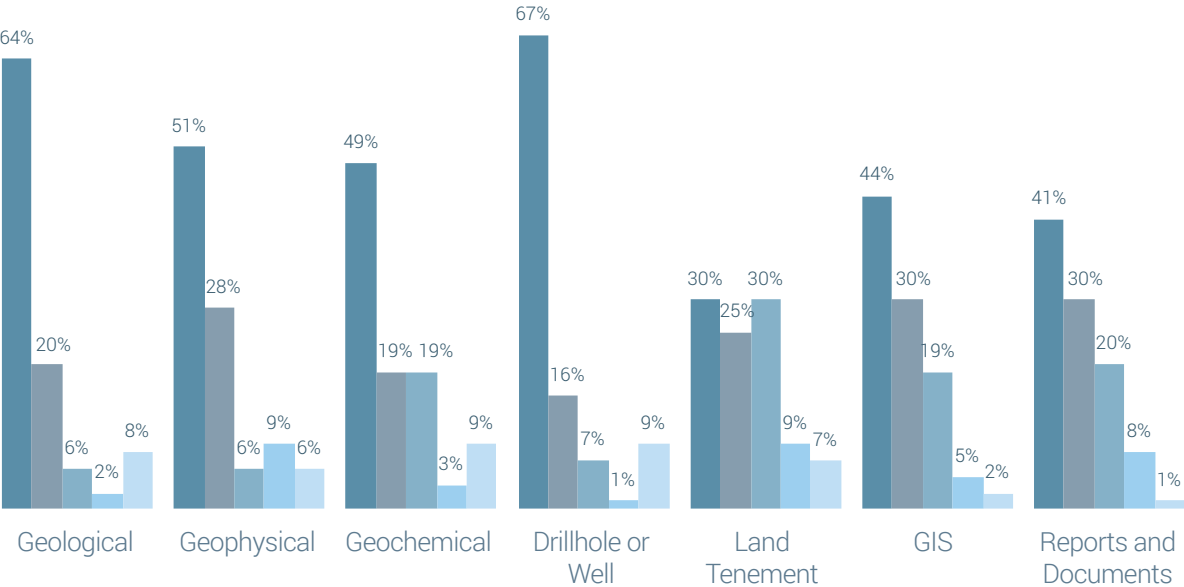
Geophysicists



Likewise 72% of responding geophysicists ranked data management of geophysical data as critical. Exploration managers rank geological and drillhole or well as the most important data to manage, followed by geophysical data.

- Most important
-
-
-
- Least important

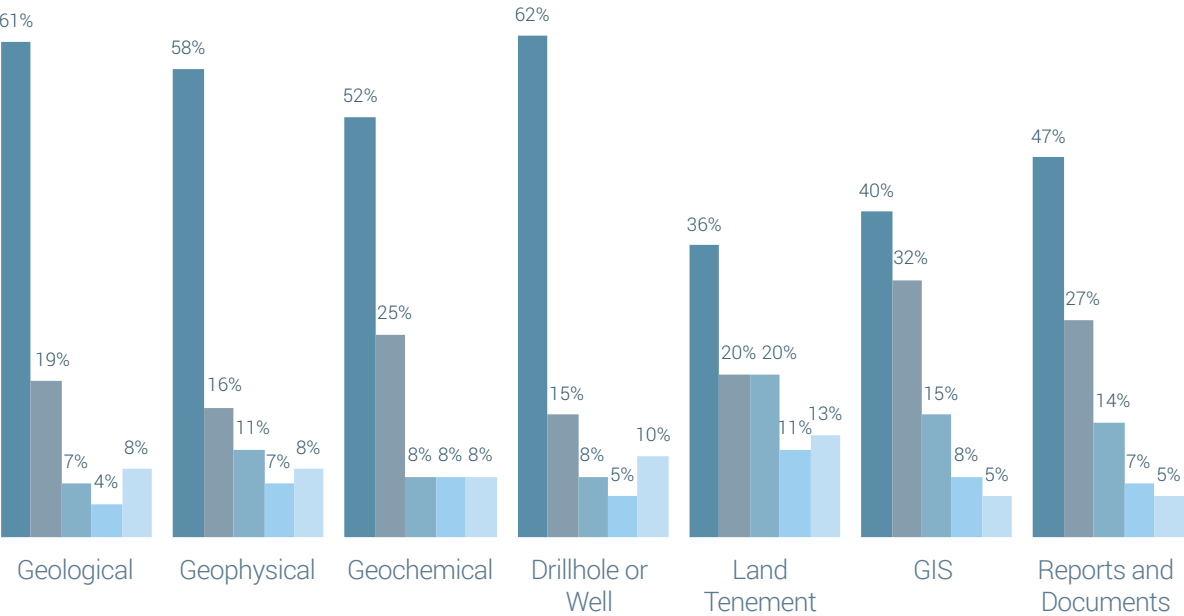
Data Managers



In contrast data administrators and executives/managers take a more balanced view and see the importance of investing in managing a broad range of data types.

- Most important
- Important
- Somewhat important
- Not important
- Least important

Executive/Manager



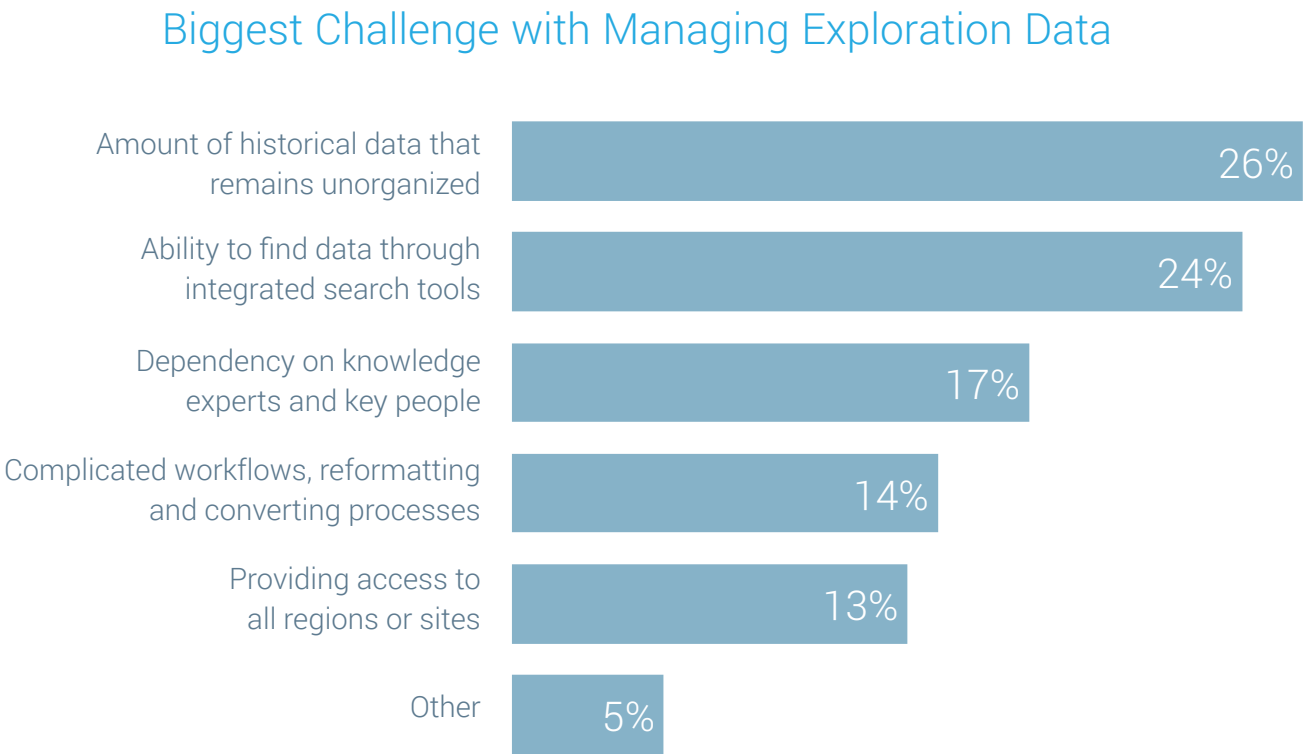
An inference from the results of the survey is that the highest importance is placed on data that is collected or measured. This aligns with organizations valuing the data collected as assets with a much higher replacement cost. Interpreted or summary data is given less importance supporting the concept that it can be regenerated or reinterpreted.

Q5. What is your biggest challenge with managing your exploration data?

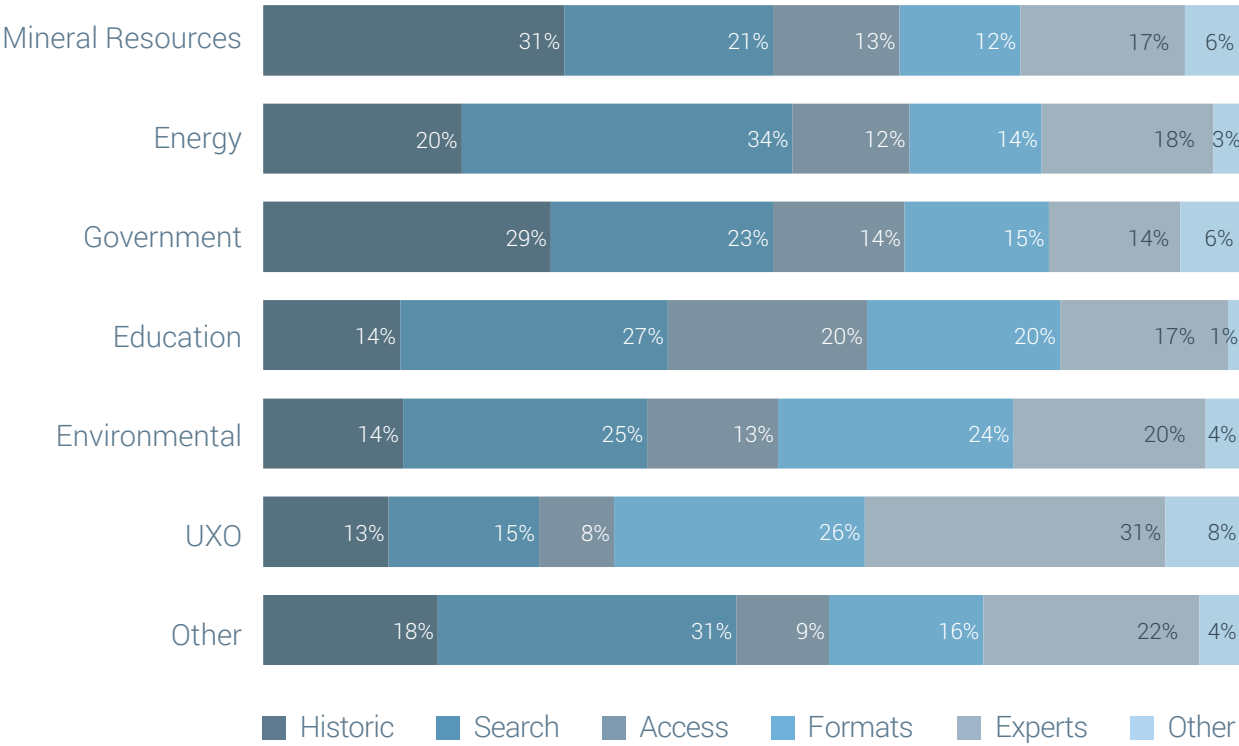
Based on comments from 2013, in 2015 we expanded this question with an option related to challenge of managing historical data. Organizations clearly rank managing historical data as a formidable challenge.

Providing an integrated search tool came in as the second highest response, down from first in the 2013 survey (though this is due to including historical data).

Just under half of the respondents that answered “Other” provided comments that indicated they were predominantly impacted by multiple factors.



Biggest Challenge with Managing Exploration Data by Industry



There are no strong correlations around factors such as dependency on knowledge experts and key people or how specific data is managed (i.e. commercial solutions, internally developed). There are strong trends within the different industries and sectors surveyed.

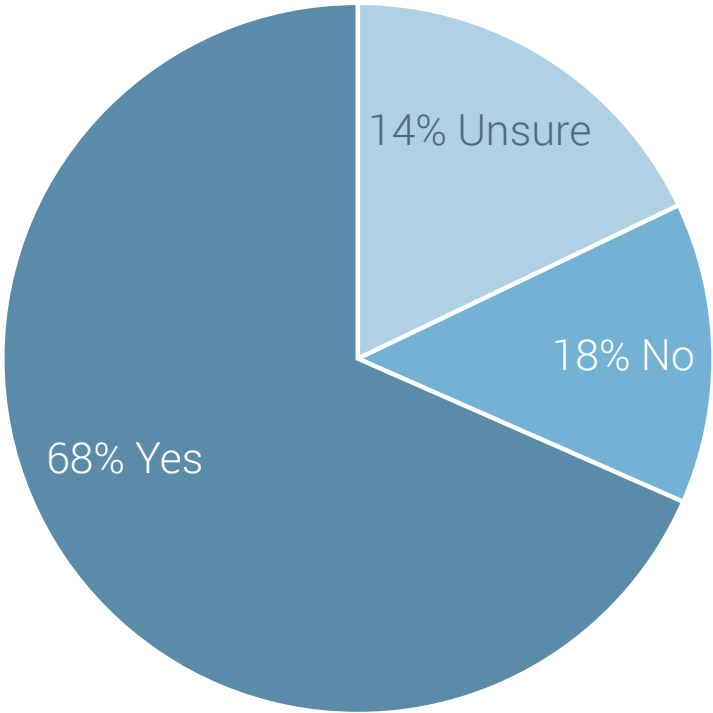
For example, the environmental and unexploded ordnance sectors noted that “Dependency on knowledge experts and key people” was the biggest challenge.

Government and mineral resource organizations ranked “The amount of historical data that remains unmanaged/disorganized” was the most significant factor, while energy and education organizations favored “integrated search tools” as the most significant challenge.

Q6.a. Does your organization face challenges resulting from having a large amount of historical or legacy exploration data to review and manage?

In this year’s survey we added a two-part question to see how organizations viewed challenges related specifically to historical data. 68% of the survey respondents reported challenges with historical or legacy exploration data and this was consistent across all industries.

Facing Challenges Resulting from Having a Large Amount of Historical or Legacy Exploration Data



Q6.b. What is the biggest challenge your organization faces when considering the management of historical or legacy data?

No single issue stood out around how to resolve the historical data management challenges when viewing the survey as a whole, though differences are apparent when viewing the results by industry.

The mineral resources industry and government organizations responded the biggest challenge lay in the amount of time and resources required to address this challenge.

In the energy industry, each challenge was equally weighted. With the environmental and UXO industries, locating and accessing the historical data was deemed the biggest challenge.

In the portion of respondents that replied “Other” and included comments, there was an even distribution between noting they faced all of these challenges or that historical data was not an issue.

Biggest Challenge with Managing Exploration Data

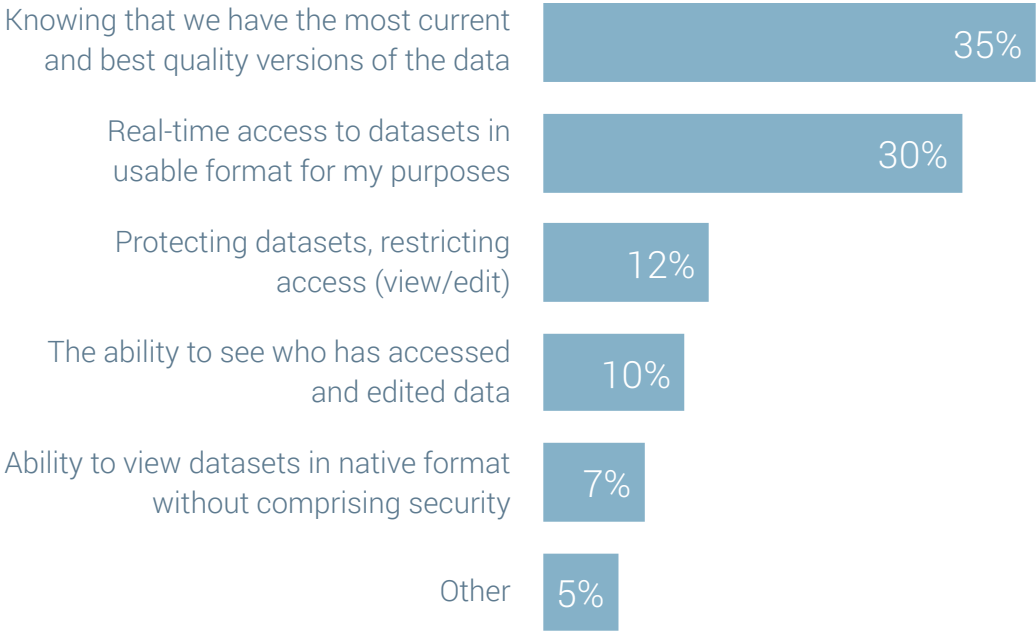
	2015
The amount of time and resources needed to take on this challenge	28%
Locating and accessing the historical data	24%
Assessing the overall quality and relevance of the historical data	24%
The ability to clean the historical data to current data management standards	21%
Other	4%

Q7. What is your organization’s biggest challenge when collaborating on active exploration project data with others?

Collaboration as a theme showed in many of the comments in our previous surveys. We therefore added a new question in to this year’s survey. The key factors that stand out are “real-time access” and “knowing that the most current and best data” is being shared. Controlling who sees the data (security) and usable formats were all ranked to be of lesser importance. The distribution of responses was fairly consistent between roles and by industry.

In the comments on this question, several respondents noted the challenges of sharing datasets between technologies (interoperability) as more relevant than security. Several respondents also remarked on the need for cultural change along with the processes and the technology to support collaboration as an important theme.

Challenges Collaborating on Active Project Data



Q8.a. How much time do you feel your organization’s geoscientists spend on data management tasks?

In this year’s survey, mirroring the 2013 survey, approximately a quarter of those surveyed said geoscientists were spending 4 - 8 hours per week on data management tasks, which given a standard 40 hour work week equates to 15% of a user’s time spent on data management.

The 2015 survey, which reached a larger group of respondents, captured a large upswing in the number of respondents (23%) that could not identify the time spent by end users on data management tasks.

Reviewing the average time spent by geoscientists by industry shows that education spends the least time on data management, while government organizations identified the largest portion of their geoscientists spending 12 or more hours per week.

The government organizations also had the highest proportion of their responses, 31% compared to the average of 23%, who did not know how much time was spent on these tasks.

Time Spent on Management Tasks

	2013	2015
Less than 4 hrs per week	26%	20%
Between 4 - 8 hrs per week	30%	26%
Between 8 - 12 hrs per week	16%	16%
Greater than 12 hrs per week	14%	15%
Do not know	15%	23%

In organizations where geoscientists manage their own project data separately (refer to Q3), time spent on data management is more likely to be reported as “Less than 4 hours per week” or “Do not know”. This may signify that when users manage their own data it is viewed as light housekeeping or that it is not something that the organization as a whole is aware of.

When data management was considered more important (refer to Q1), more time was spent on data management and a smaller proportion of respondents are unsure or unaware of how much time is spent. Meanwhile, in organizations where data management is not a focus or not important, there is also a larger proportion that don’t know how much time is spent.

Q8.b. Do you feel the time spent by your organization’s geoscientists on data management tasks is appropriate?

Having categorized the average amount of time an organization’s geoscientists spent on data management tasks, respondents were asked to qualify whether they felt the time spent was appropriate.

Overall, 19% of respondents quantified their estimates of the time spent by geoscientists in data management task as too high, irrespective of whether they are spending less than 4 hours or greater than 12 hours per week.

When considering responses from those that self-identified as exploration managers, executives, managers & owners, over 50% of these felt too much time was been spent, again irrespective of the actual time spent.

Geoscientists themselves, were more confident that the time spent was appropriate. For those that responded they spent “Less than 4 hours per week”, 40% of them said this was “Too little” implying that there is a minimum effort required for handling data.

Qualification of Time Spent on Management Tasks

	2015
About right	43%
Too little	20%
Too much	19%
Unsure	19%

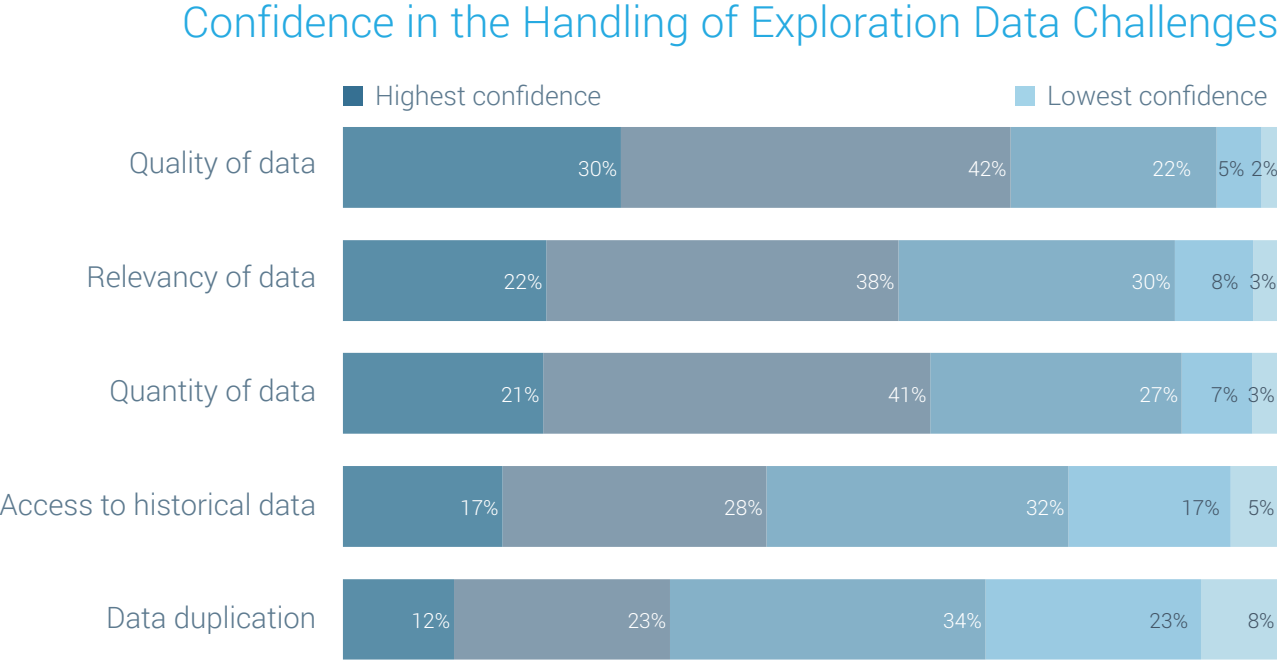
A larger proportion of the respondents who did not know how much time geoscientists spend on data management identified their biggest challenge as the amount of unmanaged historical data (in Q5). Organizations that recognize that they have a lot of historical data may have less confidence in knowing how much time is being spent on data management and they also see the “time and resources” needed to invest in a data management solution as a top concern.

Q9. Given the many different exploration datasets within your company, do you feel confident that your organization has a handle on the following items?

The 2015 survey asked respondents to judge their confidence in how well their organization addressed different data management challenges.

The quantity and quality of the data rated the highest confidence levels. Overall there was an increase in confidence related to quantity of data being managed and the overall quality compared to 2013.

There was the least confidence in the amount of duplication, followed closely by access to historical data. There was less concern for “Access to relevant data”.



Q10. Of the following concerns, which is the most important to you when thinking about maintaining any data management solution?

In the 2015 survey we introduced “complexity of integrating existing data silos” as a response option. This was rated as the biggest concern for energy and mineral resources organizations. The costs of the solution were the primary concerns for government and education organizations.

The “time and resources required to populate...” responses were highly correlated (0.64) with those who responded their organization faced challenges with historical data (Q6).

The introduction of the response focused on integration changed the result from our 2013 survey, where the cost of the solution was the biggest concern.

Most Important When Maintaining a Data Management Solution

	2015
The complexity of integrating existing data silos to provide a complete managed data experience for end users	33%
System, database and service maintenance costs/effort	25%
The time and resources to fully populate the data management solution	25%
Availability of data managers to oversee the solution	14%
Other	3%

Q11. What would be your preferable approach to solving your exploration data management challenges?

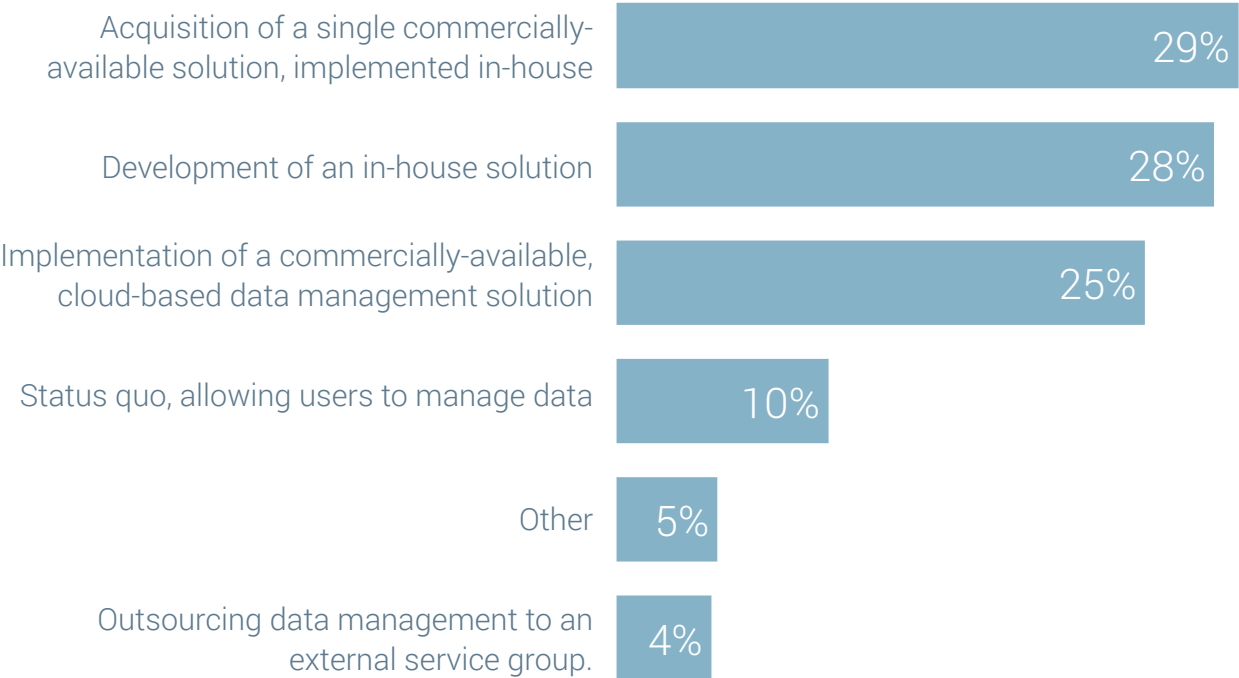
Access to a single, commercially-available solution was the most preferable approach (29%) with another quarter of respondents looking to implement commercial cloud-based solutions. 10% of respondents are looking to stay with the status quo and only 4% would consider outsourcing this process to an external service group.

Government organizations are the keenest on in-house developed solutions with 39% of their respondents indicating this is their preferred approach. Respondents from energy and mineral resources organizations preferred commercial solutions (deployed in-house or cloud-based).

Looking at the responses by role, exploration managers, executives, and owners strongly prefer (39%) deployed commercial solutions over the proposed alternatives. Likewise, data managers also have a strong preference for deployed commercial solutions. Commercial cloud-based solutions have a high acceptance rate within smaller mineral resources organizations compared to the industry overall.

Many of the comments for this question remarked on a combination approach between commercial and in-house solutions.

Approaches to Solving your Exploration Data Management Challenges



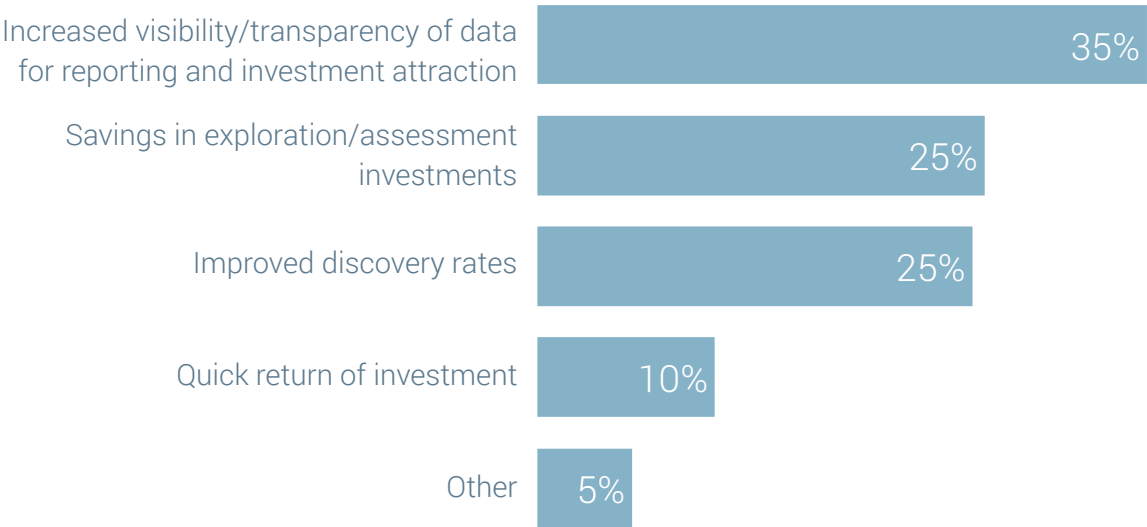
Q12. What is the most important outcome that you would expect from resolving data management and accessibility issues?

Increasing visibility and transparency of data for the purpose of reporting and investment attraction remains the outcome that most respondents (35%) expect as an outcome from their organization’s data management and accessibility issues. Savings in exploration/assessment investments and improved discovery rates both had response rates of 25%.

“Improved discovery rates” was the most important outcome for the mineral resources industry while “Increasing visibility and transparency of data for the purpose of reporting and investment attraction” was the most important for government and energy organizations.

Few respondents feel they would see a quick return on investment as an outcome. Those that responded “Other”, and gave comments, can be divided almost equally in to either “granting wider access to data” or looking for combinations of responses provided.

Outcome from Resolving Data Management Issues



People who responded that they were unsure about how much time is spent on data management tasks (Q8) were more likely to report being most concerned about the time and resources to fully populate a data management solution (as noted in Q10) and more likely to report that the most important benefit would be “increased visibility/transparency of data”. These may be shared concerns in organizations where data management is a hidden cost.



Geosoft Inc.

Queens Quay Terminal, 207 Queens Quay West, Suite 810, PO Box 131 Toronto, ON Canada M5J 1A7
+1 800 363-MAPS, explore@geosoft.com, www.geosoft.com

International Offices:

Geosoft Africa Ltd., Geosoft Australia Pty. Ltd., Geosoft Europe Ltd., Geosoft Latinoamerica Ltda., Geosoft (USA) Research Inc.

©2015 Geosoft Inc. All rights reserved. Geosoft is a registered trademark of Geosoft Inc. Other brand and product names mentioned herein are properties of their respective trademark owners. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form, or by any means, electronic, mechanical, photocopying, reading, or otherwise, without prior consent from Geosoft Inc. EIMS.R.06.15