GEOSOFT®

SEEQUENT

Every day we create 2.5 quintillion bytes of data — so much that **90% of the data in the world today has been created in the last two years alone**.

-IBM, "Big Data Success Stories"

2013

Exploration Information Management Survey

Prepared by:
Steve Randall, VP of Marketing

CONTENTS

Introduction

In January 2013, Geosoft ran its second Exploration Information Management Survey. Building upon our 2011 survey, we chose to broaden the 2013 Survey to include more user roles and organizations from different industries and government segments.

Our approach was to construct a simple survey of 10 questions that would allow us to gain insight into:

- What the key data and information management challenges are.
- Who is involved in managing these challenges, and who is impacted by them.
- How you would approach solving these issues.
- What impact solving these issues would have on an organization.

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. In total we received 693 responses from over 415 organizations and their subsidiaries around the globe.

Response by Organization	%
Mineral Resources	61%
Energy	11%
Government	9%
Other	5%
UXO	5%
Education	5%
Environmental	4%

Response by Organization	
Mineral Resources	426
Energy	74
Government	59
Other	37
UXO	36
Education	34
Environmental	28

Response by Title	%
Geophysicist	55%
Exploration Manager	12%
Data Administrator	9%
Geologist	7%
GIS Specialist	6%
Executive Manager/Owner	5%
Educator, Researcher, or Student	3%
Other	3%
Geochemist	1%
IT Administrator	1%

1. For your organization, where does 'data management' rank as an issue?

2013 Survey

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

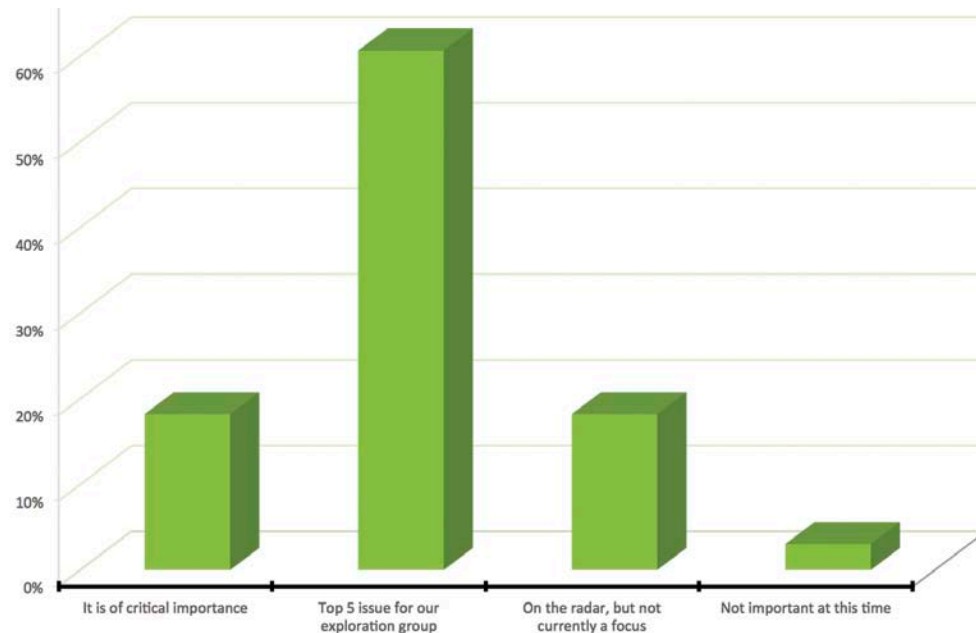**2011 Survey**

|	
It is of critical importance	18%
Top 5 issue for our exploration group	61%
On the radar, but not currently a focus	18%
Not important at this time	3%

2013 Survey
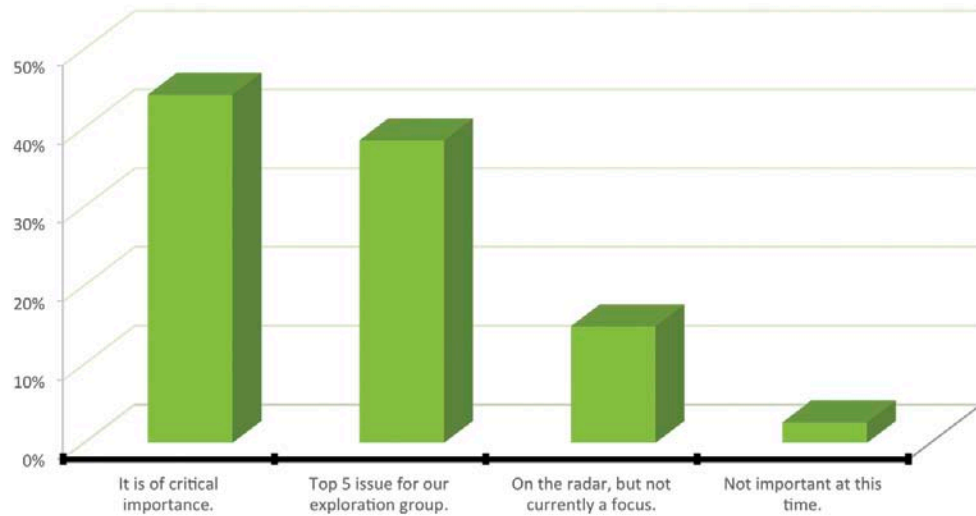
2011 Survey

Across the board, managers, administrators, and all related respondent groups feel that data management is of critical importance, with over 44% of respondents seeing it as such, and another 38% regarding it as a "top 5 issue" for their group or organization. These results show that data management has grown significantly as a concern since 2011, at which time only 18% of respondents saw it as critically important.

One possible reason for this shift in emphasis is that a greater number of end users were included in the survey as compared with the 2011 Survey. However, by analyzing the response of those that identified as managers, executives or owners, statistically we see the same distribution of responses. Based on this, we can conclude that data management concerns are rising within the organizations surveyed.

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

Where does 'data management' rank as an issue by industry?
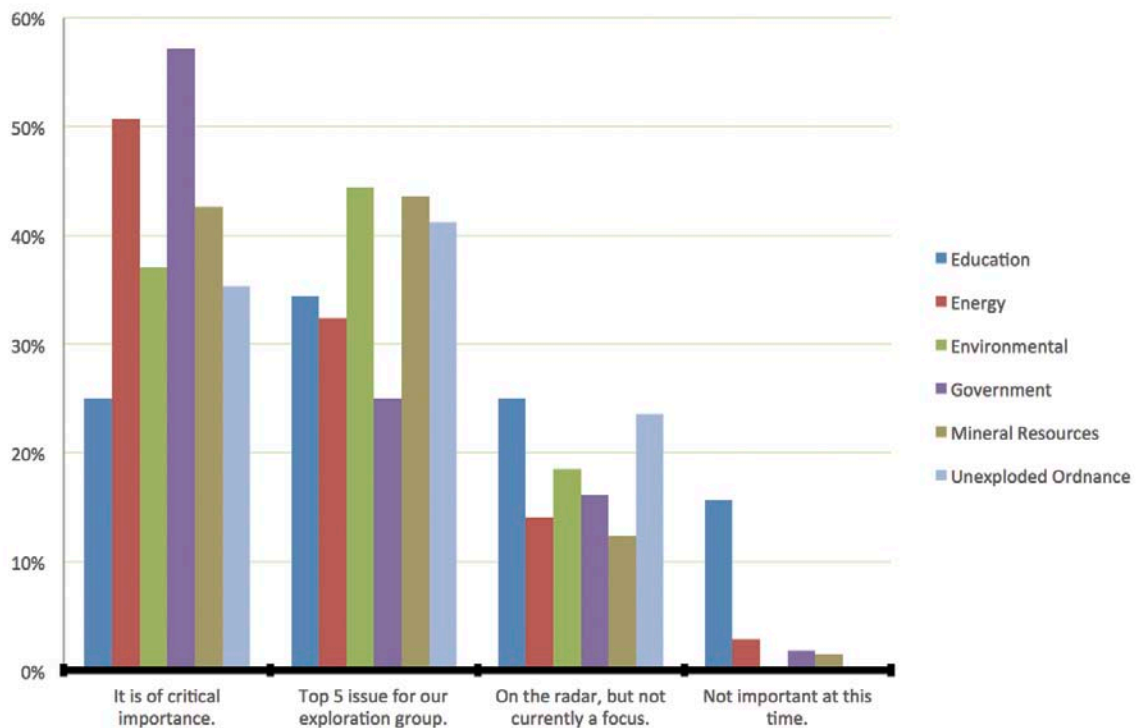
Compared with other industries surveyed, respondents from energy and government organizations identified data management as critically important. In contrast, educational and environmental organizations ranked this least important.

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

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

|	
Each geoscientist manages their own project data separately.	16%
We use a folder/file structure on a centralized server.	40%
We use an internally developed solution.	15%
We use a commercially available solution.	22%
Other	7%
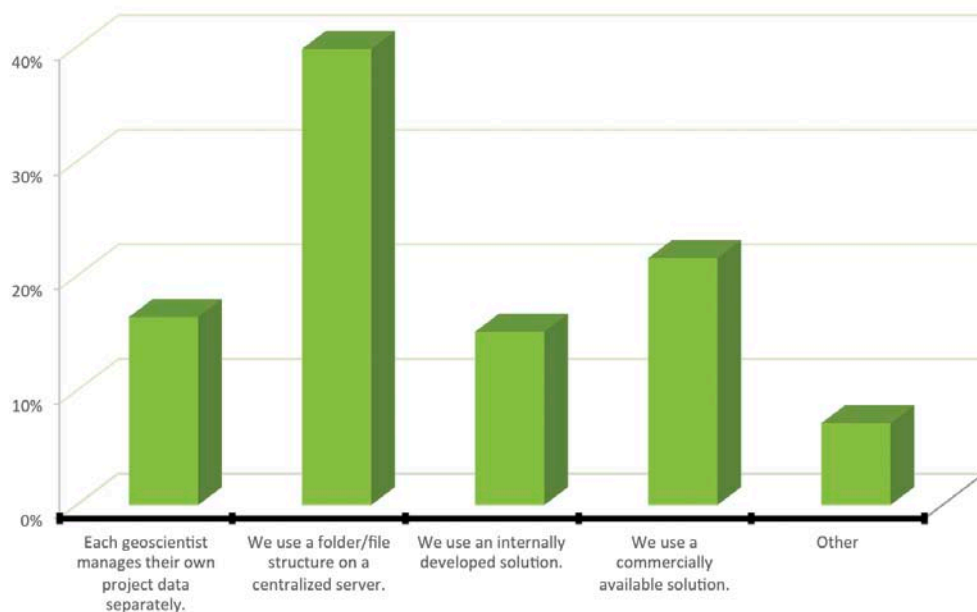
The vast majority of respondents manage their drillhole and geological data via a folder/file structure on a centralized server. The next largest group use commercially available solutions. Internally developed solutions and allowing each geoscientist to manage their own data individually ranked as the third most popular method. Within those that use commercially available solutions, the majority of respondents were within the mineral resources industry.

A large number of respondents commented that they used combinations of these approaches within different projects/regions, or did not have drillhole data to manage. Of these, there was no noted geographical split.

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

|	
Each geoscientist keeps their own project data separately.	20%
We use a folder/file structure on a centralized server.	51%
We use an internally developed solution.	10%
We use a commercially available solution.	14%
Other	6%
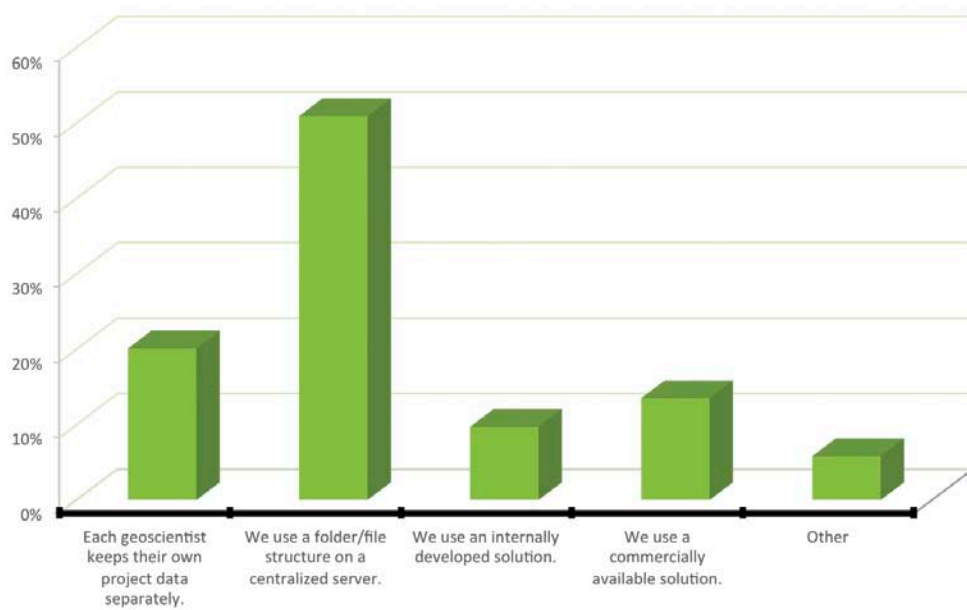
Similar to the ways in which drillhole and geological data are managed, over half of respondents use a centralized server to manage their geophysical and other geoscientific data. However, fewer respondents seem to be using commercially available solutions, with the next highest category being organizations preferring each geoscientist to keep their own project data separately.

In correlation with the sentiments expressed below in Question 9, these results seem to suggest a growing desire for organizations to centralize their data, combined with greater in-house access. This represents a shift in approach when compared to the 2011 survey results , in which one third of geoscientists claimed they managed their data individually. This shift to centralization may be in direct response to a growing need for organizations to protect data assets while undergoing contraction or structural changes.

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

(1 is low importance, 5 is high importance)

	Lowest Importance				Highest Importance
Geological	51	39	81	160	369
Geophysical	43	23	52	140	442
Geochemical	96	64	105	140	295
Drill hole	96	41	69	97	397
Land Tenement	121	98	152	116	213
GIS	45	69	121	176	289
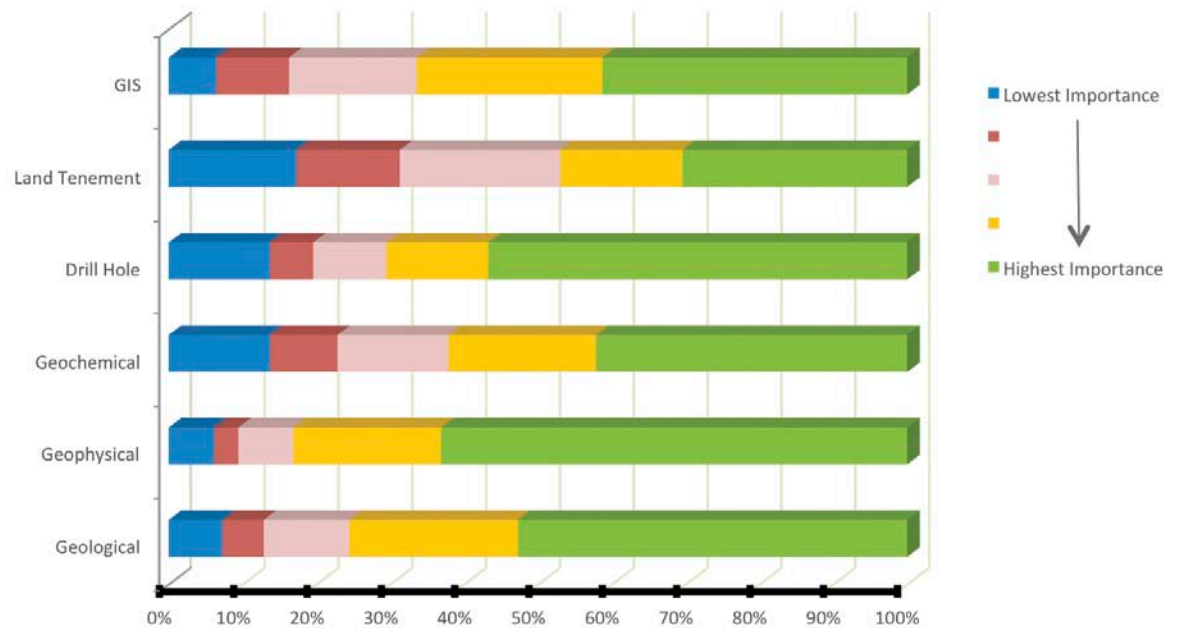
Based upon 700 responses to this question, geophysical data ranked highest in importance for data management, while land tenement data ranked lowest. Traditionally we have seen a higher ranking for geological and drillhole data, however, by incorporating additional industry types such as government and education, the rankings shifted within this year's survey.

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

|	
Providing access to all regions/sites	12%
Ability to find data through integrated search tools	29%
Complicated workflows, reformatting & converting processes	25%
Too much dependency on knowledge experts & key people	25%
Other	9%
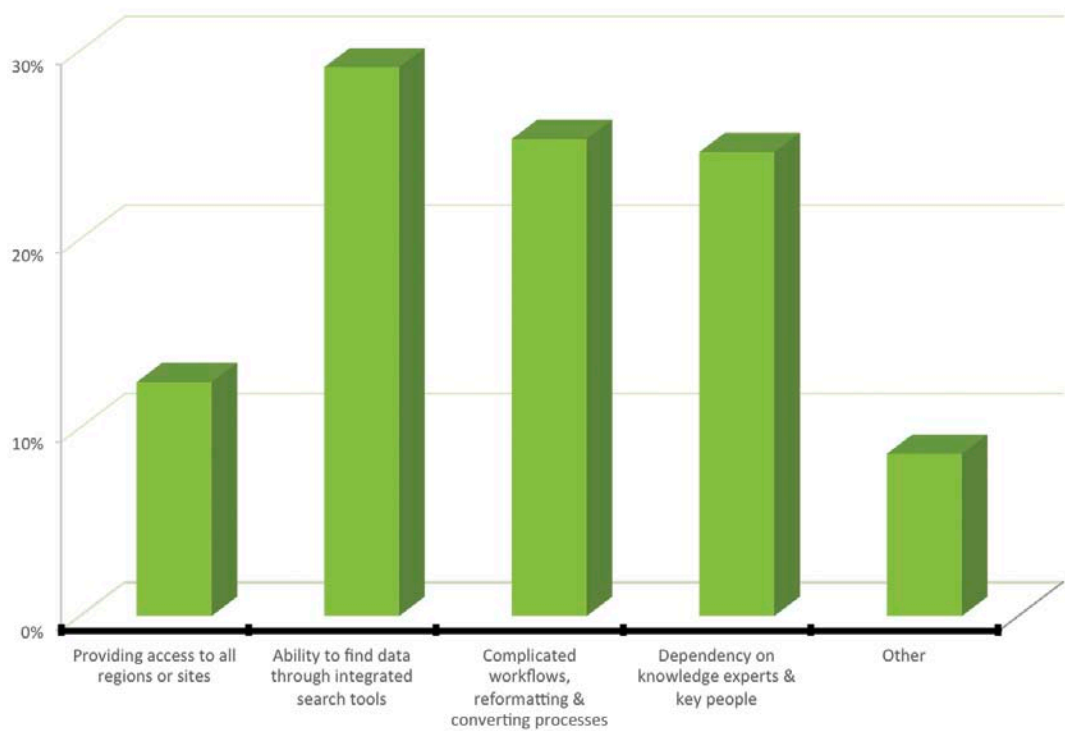
The greatest challenge in managing exploration data seems to lie in the ability to locate data through integrated search tools. This challenge is most predominant within larger organizations. However, respondents also listed the complication of workflows and the dependency on key knowledge experts as hindering factors.

There is limited concern about the ability to provide access to all regions or parts of an organization, with only 12% of respondents feeling that this was an issue. This is down from the last survey where it ranked as more critical.

Over two thirds of the respondents that gave an answer of "other" provided comments that indicated they were predominantly impacted by multiple factors.

6. How much time do you feel your organization's geoscientists spend on data management tasks?

Less than 4 hrs. per week	26%
Between 4 – 8 hrs. per week	30%
Between 8 - 12 hrs. per week	16%
Greater than 12 hrs. per week	14%
We do not know how much time is spent by our geoscientists preforming such tasks	15%
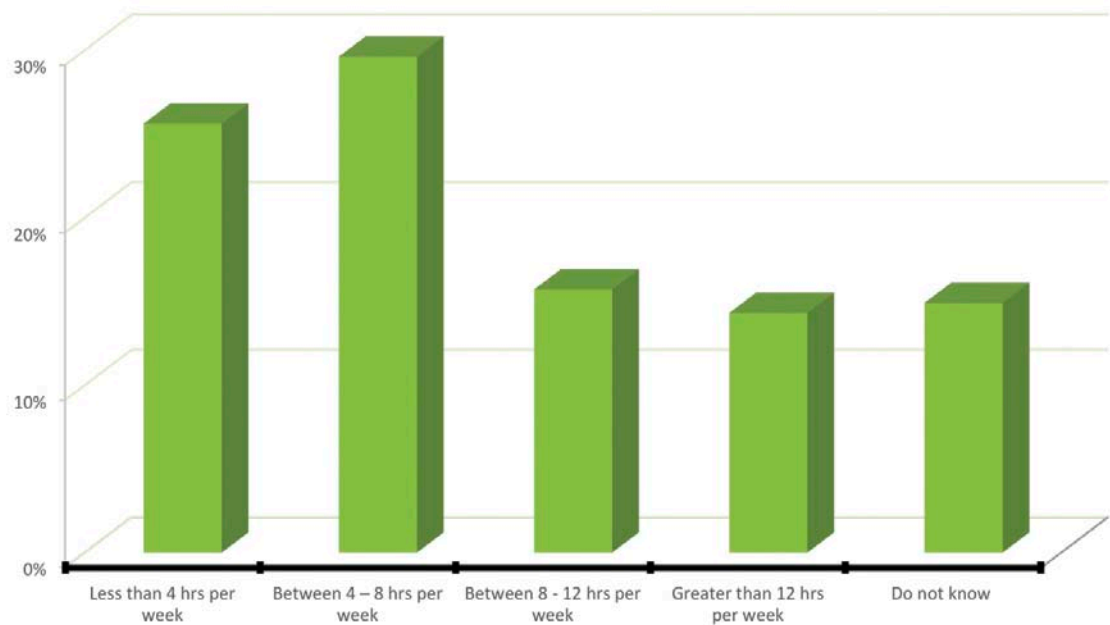
2013 Survey
Do you feel the time spent by your organization's Geoscientists on data management tasks is appropriate?

About right	42%
Too much	24%
Unsure	34%
Other	0%

2011 Survey
Do you agree the 'average' geoscientist spends more of his/her time working on data management tasks that on interpreting the data?

|	
Yes	48%
No	52%
Uncertain	0%

These results show that most organizations are spending between 4-8 hours on data management per week, with roughly one third spending almost twice that amount of time. A quarter of respondents feel they spend less than 4 hours per week on this.

In keeping with the sentiments expressed in the 2011 survey, the general consensus seems to be that geoscientists are spending just the right amount of time on this task. This year, however, one third of respondents were unsure of how much time is appropriate to commit to data management.

A key insight from this year's survey is a strong correlation between respondents' answers to the question of how critical data management is to their organization, and time spent by their geoscientists. Respondents who identified that their geoscientists are spending more than 4 hours per week on data management tasks (not including "unknown"), and those who responded that data management is either a critical or top 5 issue for their organization were correlated at 0.78. The same correlation effect was seen between those respondents that felt their organizations' geoscientists were spending less than 4 hours per week on data management and identified data management as "on the radar but not currently a focus", or "not important at this time".

7. Given the many different exploration datasets within your company, do you feel confident that your organization has a handle on:

|	Confident	Unconfident	Do not known
The quantity of data being managed?	66%	23%	11%
The quality and integrity of your exploration data?	64%	21%	15%
The amount of data duplication that exists?	31%	47%	22%
The currency of data being used by your geoscientists?	52%	26%	22%
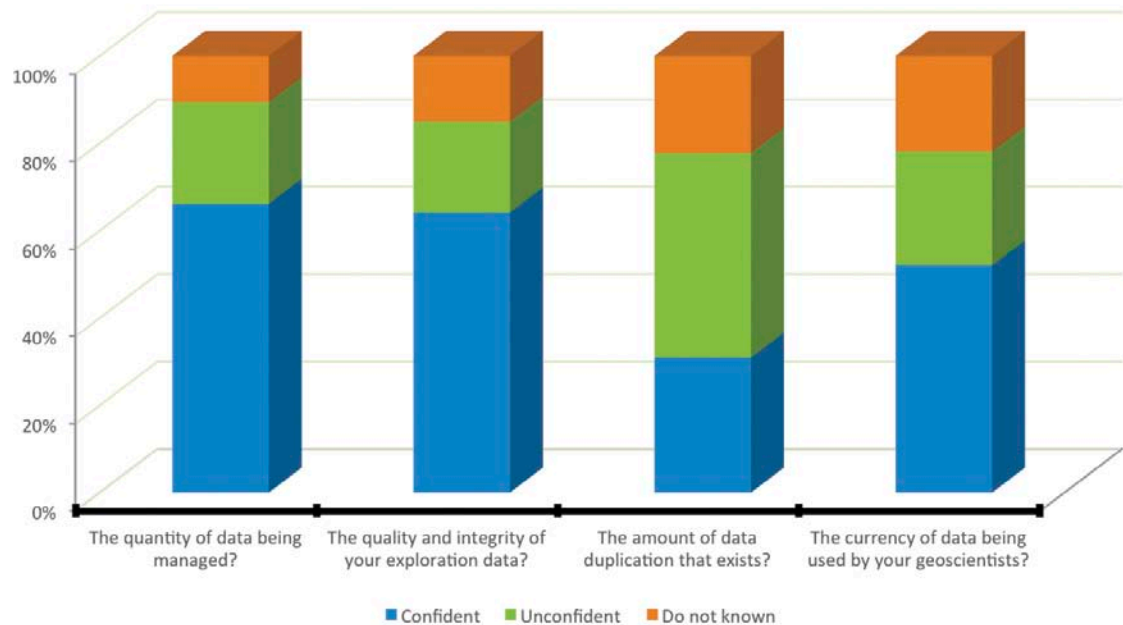
Over half of respondents are confident that their organization has a handle on the quantity, quality, and integrity of their exploration data. Most also feel that their organization's geoscientists are using the most current data available. Yet data duplication ranks lowest, suggesting many organizations struggle with the complexity and costs of managing multiple versions of their exploration data.

These findings are fairly consistent with the 2011 study, though in the case of duplication and currency, respondents are less confident than they were previously.

As noted in the previous study, data duplication was seen as an area of concern. Since then, Geosoft has engaged with clients around data management services, where one of the critical outputs is an understanding of the quantity of duplicated data within an organization. Our work in this area has shown it is not unusual to find organizations that have between 15% and 40% of duplicated data now "under management".

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

Data Manager's availability	17%
System, database and service maintenance costs/effort	43%
Lack of expertise (i.e. lack of skills or confidence) in operating an information system	27%
Turnover and attrition risks	8%
Other	5%
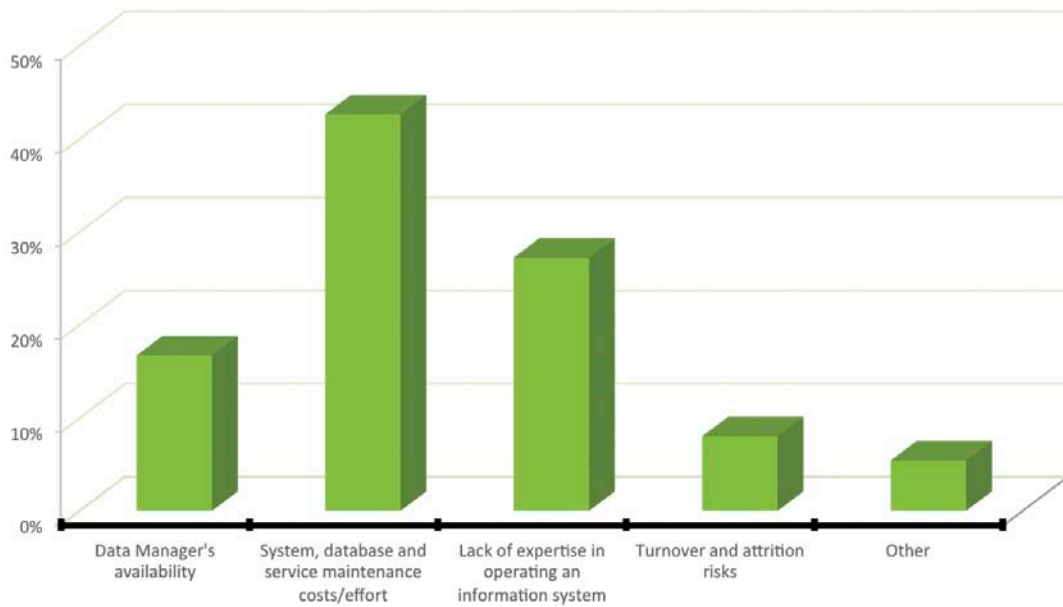
The vast majority of respondents agreed that system maintenance costs and effort are the most important concern when it comes to maintaining a data management solution. Just under one third agreed that lack of expertise in operating an information system was also important, with few responding with concerns of turnover and attrition risks. Both of these views are consistent with our 2011 results. This year, however, there were fewer comments pertaining to data quality control, and more comments from users around ease of use, integration, and workflows.

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

2013 Survey

|	
Acquire a single commercially available platform.	36%
Build a solution in-house.	28%
Hire consultants to find an integrated solution or architecture.	8%
Outsource Data management to an external service group.	3%
Leave all as is, allowing users to manage data.	14%
Other	11%

2011 Survey

|	
Acquire a single commercially-available platform.	42%
Build a solution in-house.	42%
Hire consultants to find an integrated solution or architecture.	9%
Outsource Data management to an external service group.	0%
Leave all as is, allowing users to manage data.	6%

Access to a single, commercially available platform was the most preferable approach to solving the data management challenges faced by these respondents, with only 3% wanting to outsource this process to an external service group. In correlation with the popular desire for a centralized approach, this suggests that most groups want tighter control over their data and a more efficient workflow that can be integrated across an entire organization. This idea is supported by the need for an in-house solution as the second favourite approach, and the desire to hire external consultants to find data management solutions ranking second to last.

However, despite this year's popular desire for an in-house solution, responses in favour of this have dropped significantly (-15%) from our last survey. Conversely, the option to leave challenges the way they are and allow users to manage data themselves has grown in preference since 2011 . This shift may indicate increased caution within organizations as they reflect on the current market and make necessary budget cuts.
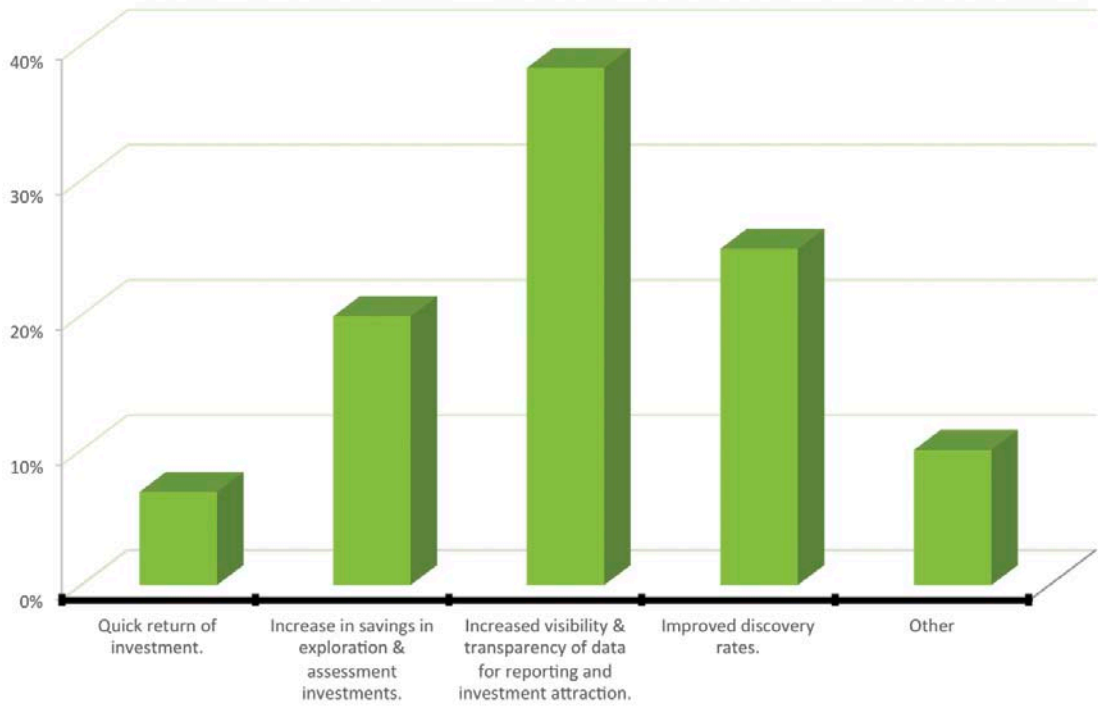
2013 Survey
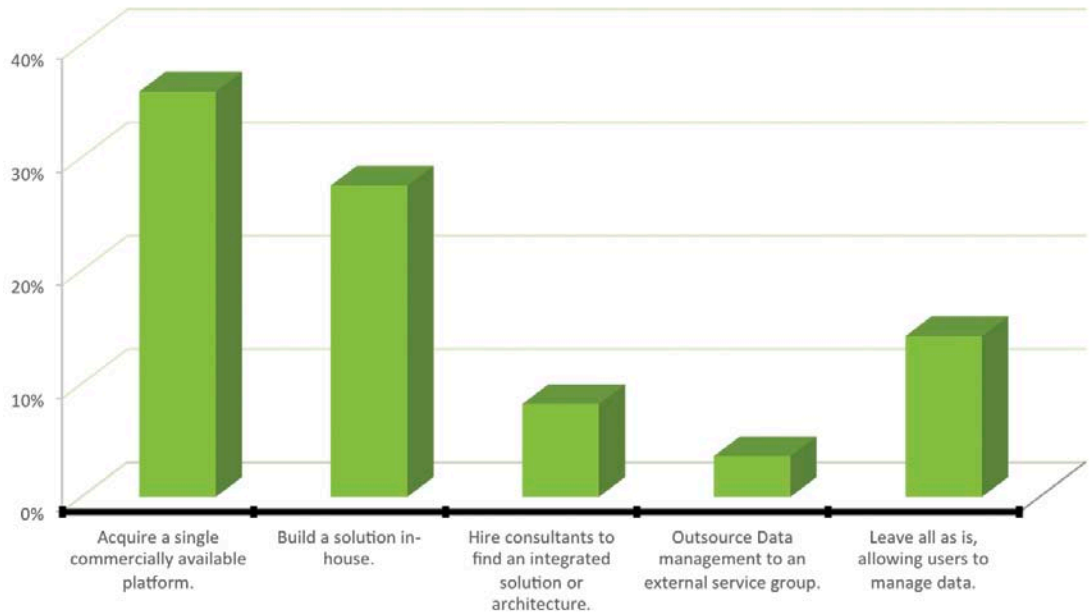
2011 Survey
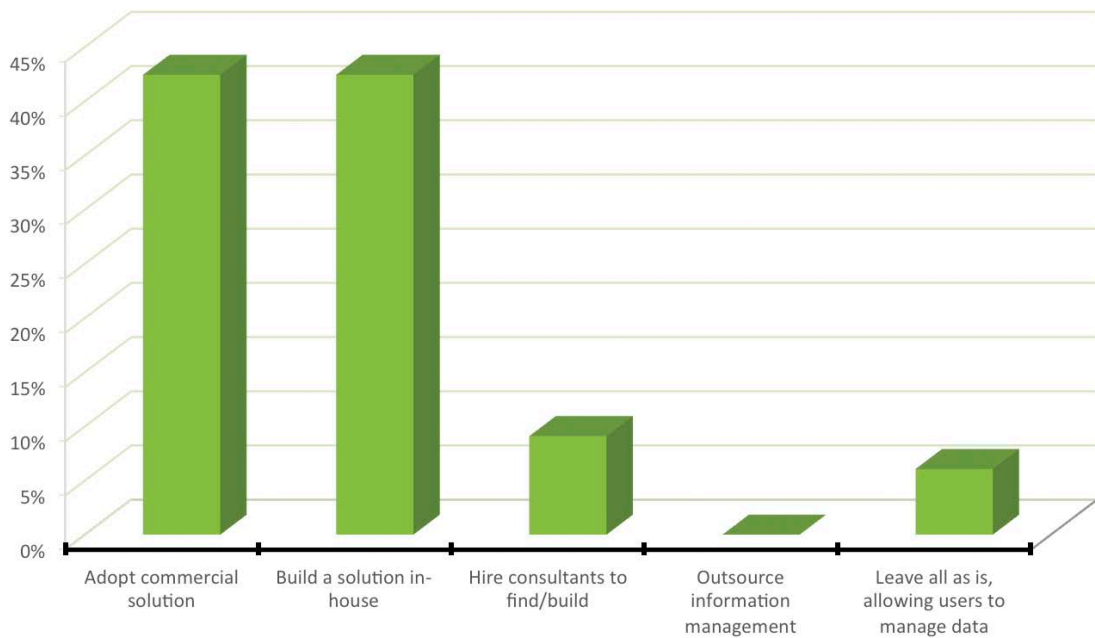
10. What is the most important outcome that you would expect from resolving data management and accessibility issues?
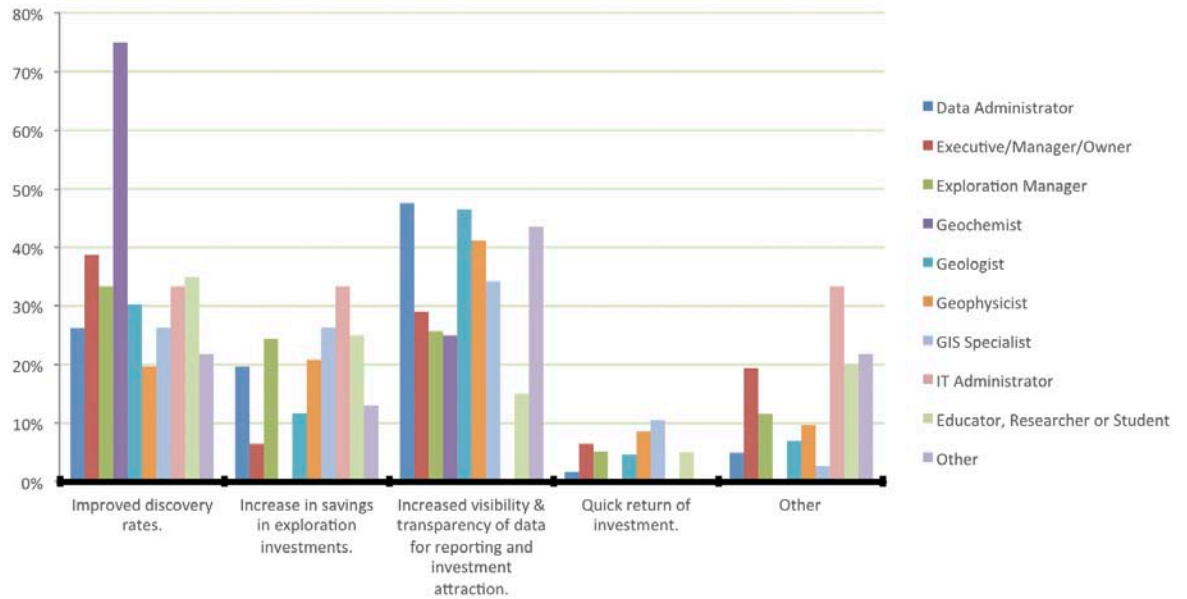
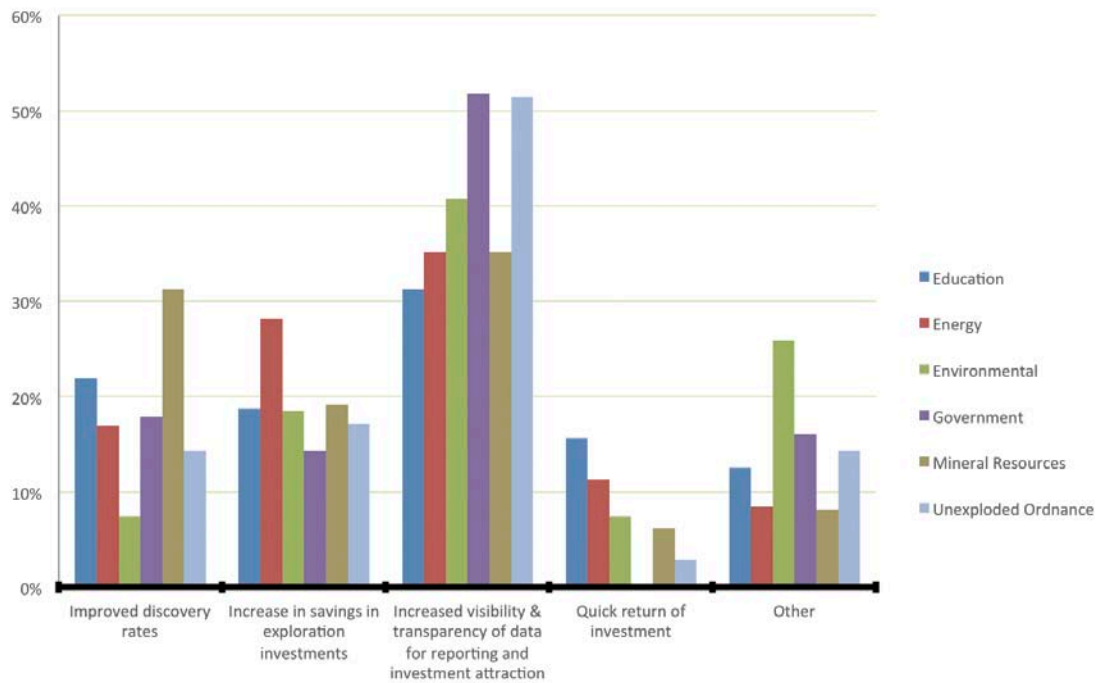|	
Quick return of investment.	7%
Increase in savings in exploration/assessment investments.	20%
Increased visibility/transparency of data for reporting and investment attraction.	38%
Improved discovery rates.	25%
Other	10%

Those who responded to this survey were less concerned with gaining a quick return on investment thanks to a more accessible data management system, and most concerned with increasing the visibility and transparency of data for the purpose of reporting and investment attraction, as well as improving discovery rates.

Those that responded "other" commented that they were looking for combinations of answers, or choosing to predominantly focus their comments on 'access to data' instead. The industry breakdown appears to reflect the different drivers for the organizations within these segments.

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

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