

The Remote Sensing Industry Analysis



Phase III

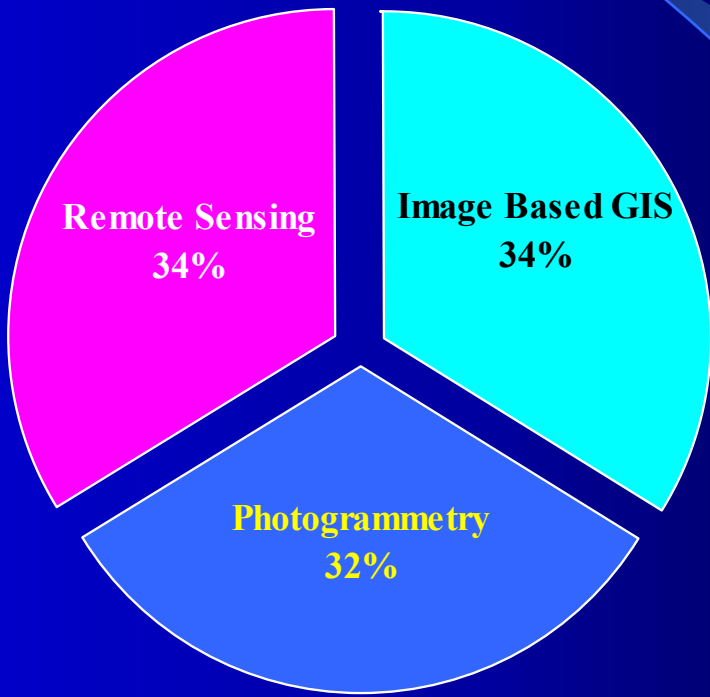
Mondello / Rabin



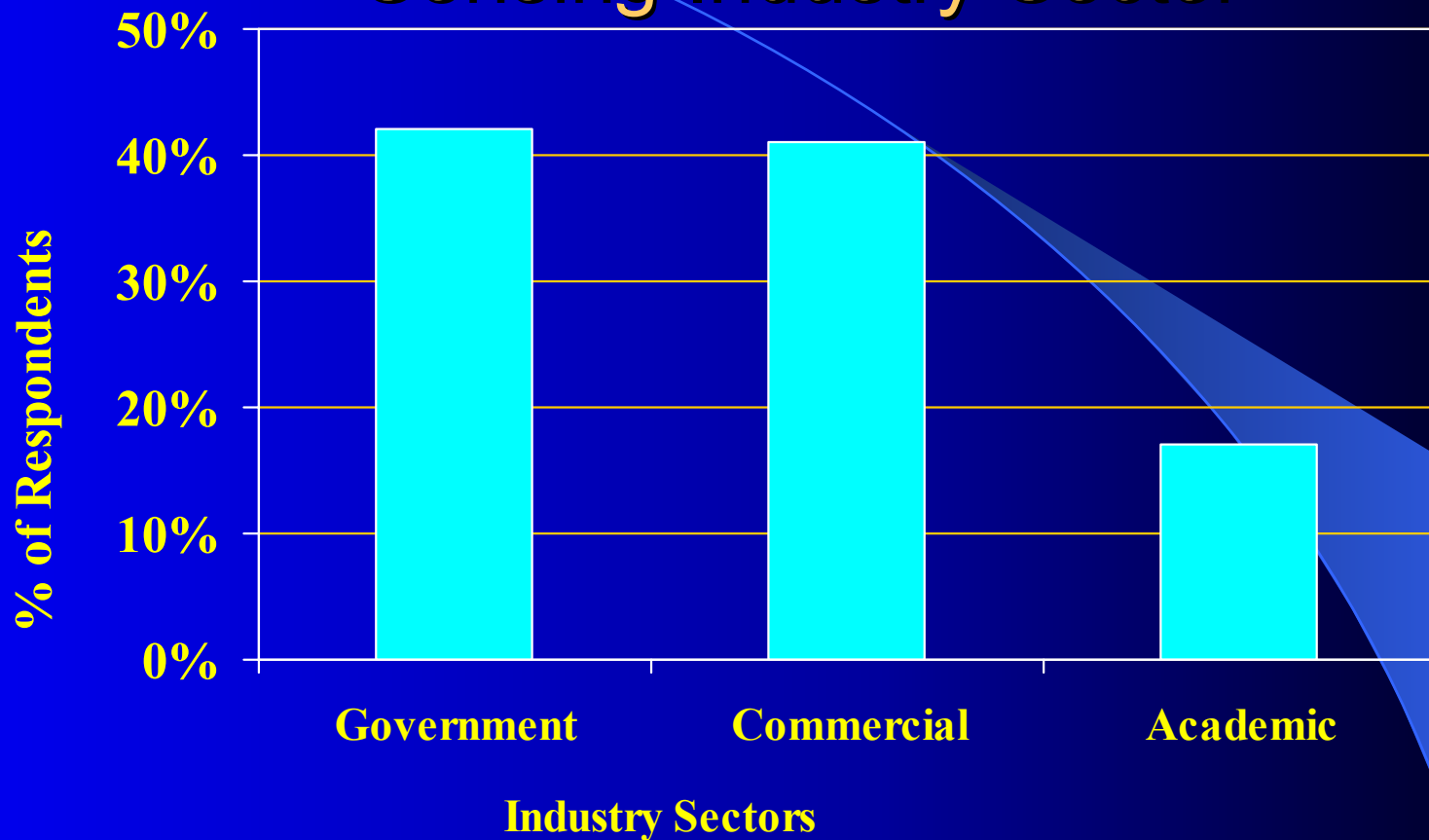
Contents

- Respondent
 - Profile
 - General Industry Information (Producers & Users)
- Producers
- Users
- Comparisons
- Conclusions

The primary work of respondent's organizations is equally divided among the three major Geospatial activities



Respondent Distribution by Remote Sensing Industry Sector



- **Most respondents work in the Commercial and Government sectors**
- **We believe this is representative of the relative sizes of the respective Professional populations**

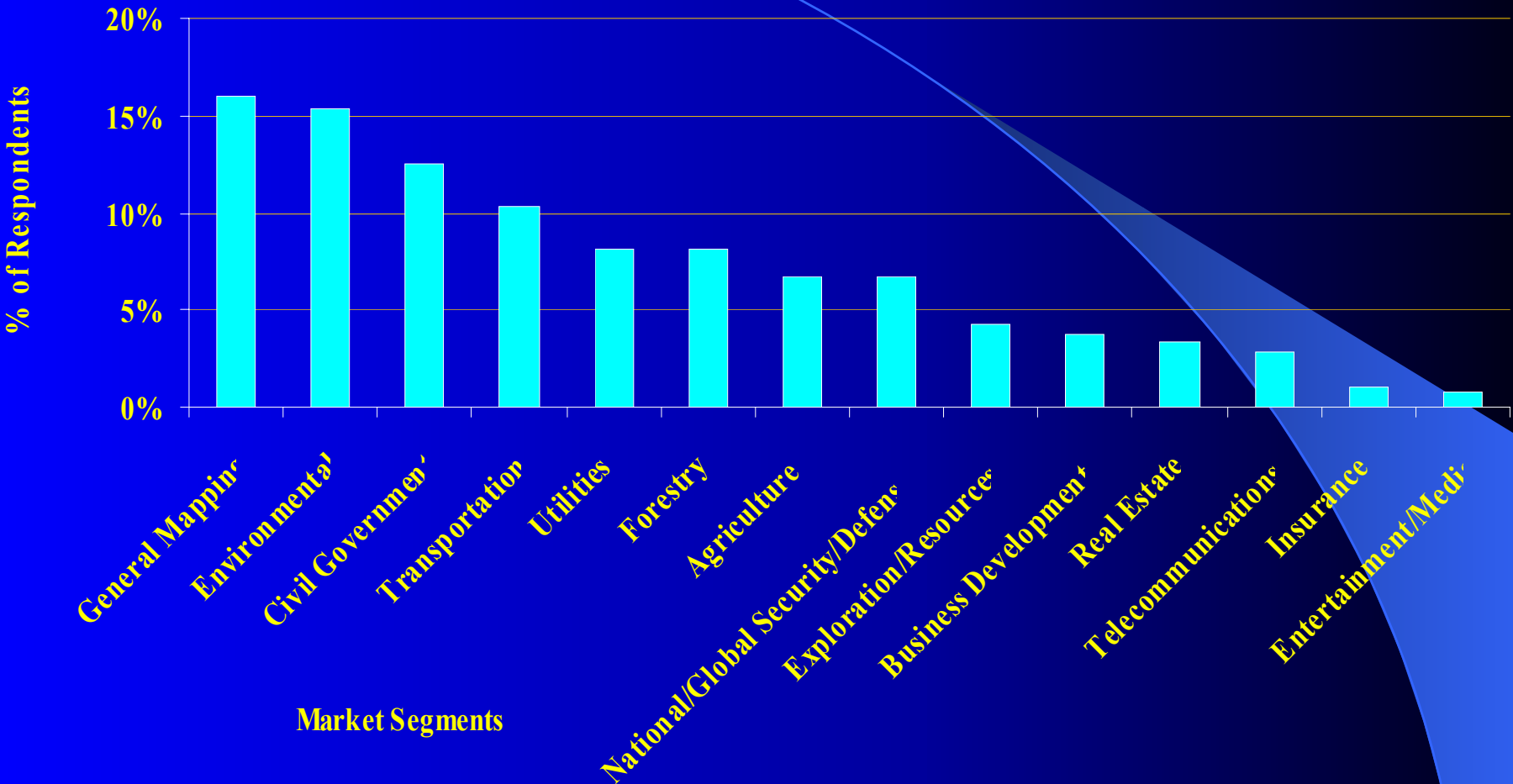


Percent of organizations that Produce vs. Use Geospatial data/information products.

Geospatial Activity	Produce	Use
Image Based GIS	56%	44%
Photogrammetry	76%	24%
Remote Sensing	76%	24%

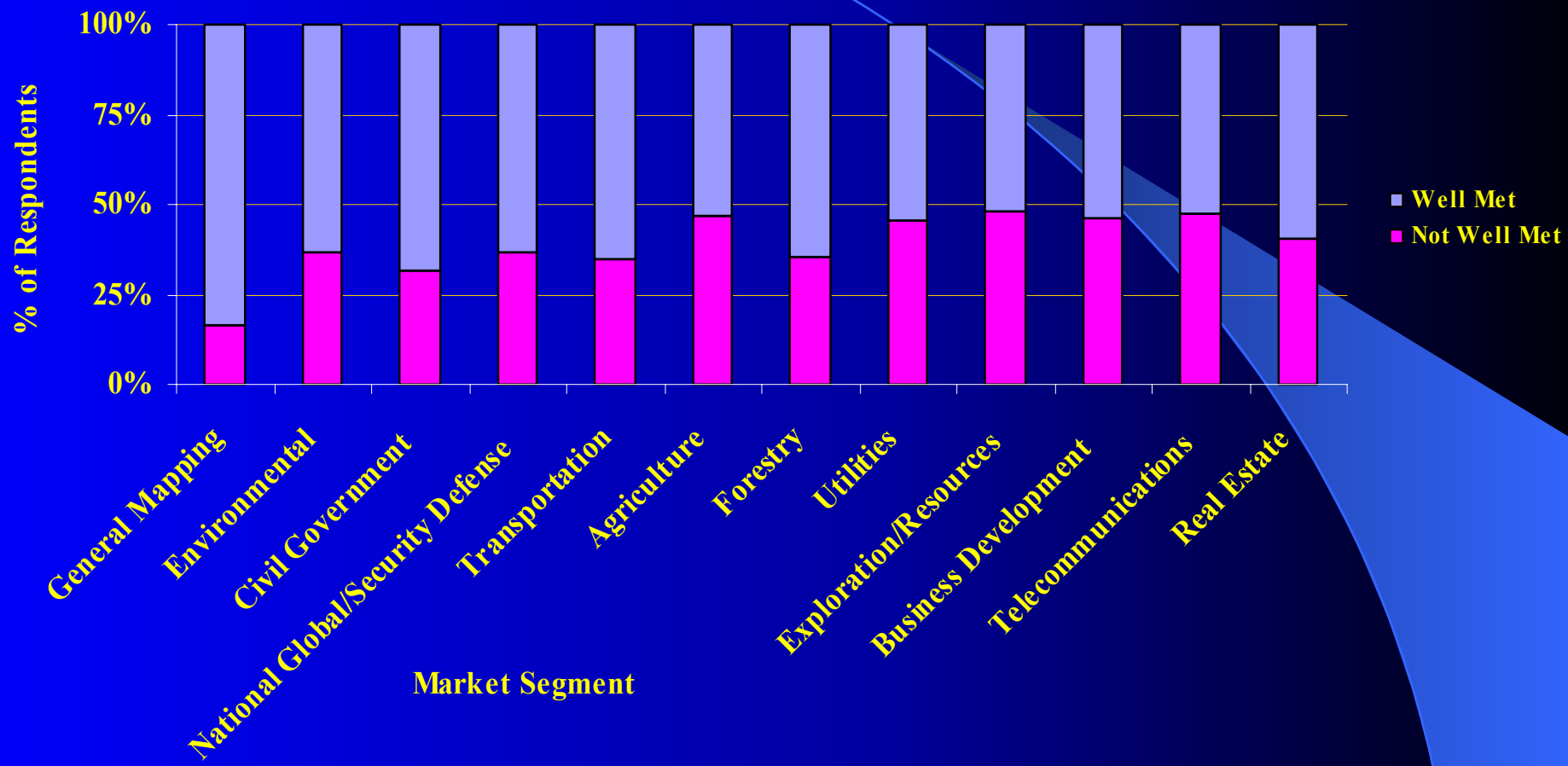


Organizational Focus on Market Segments



NOTE: We believe the National/Global Security/Defense Market is largest in dollars, but we have fewer forecast participants in this market.

Extent of Producer and User Needs Met by Market Segment





Conclusions: Respondent Profile & General Industry Information



- Based on
 - Geographic dispersion; respondent job levels and response rate, we believe this Survey presents a balanced view of the industry's Producers and Users
 - Confidence level of 95%, +/- 5.34%
- General characteristics of Geospatial organizations:
 - Tend to be equally divided between the Geospatial Activities
 - Image Based GIS equally divided between Producers (55%) and Users (45%)
 - Photogrammetry and Remote Sensing are more often Producers (75%) than Users (25%)
- Government Sector responses come primarily from the Federal and Local levels (about 40% each), while 20% are State level



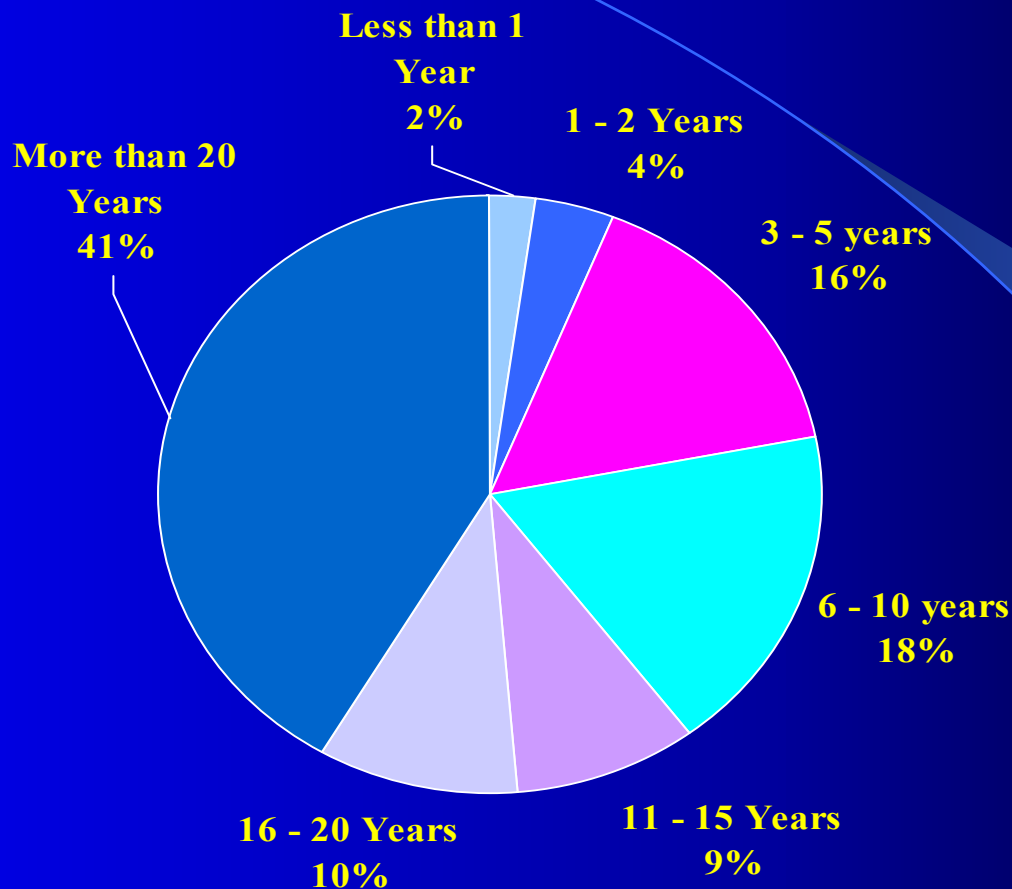
Conclusions: Respondent Profile & General Industry Information

- Organizational Market Segment focus is different among the Geospatial Activities:
 - Image-base GIS is about the same in all segments
 - Photogrammetry is focused more on General Mapping; Civil Government; Transportation; Forestry; Utilities; Exploration; Real estate
 - Remote Sensing is primarily focused on Environmental; National/Global Security; Agriculture
- The 5 most active Market Segments based on analysis of all Phases:
 - General Mapping
 - Environmental
 - Civil Government
 - National/Global Security/Defense
 - Transportation
- Other segments may offer substantial growth opportunities



Producers

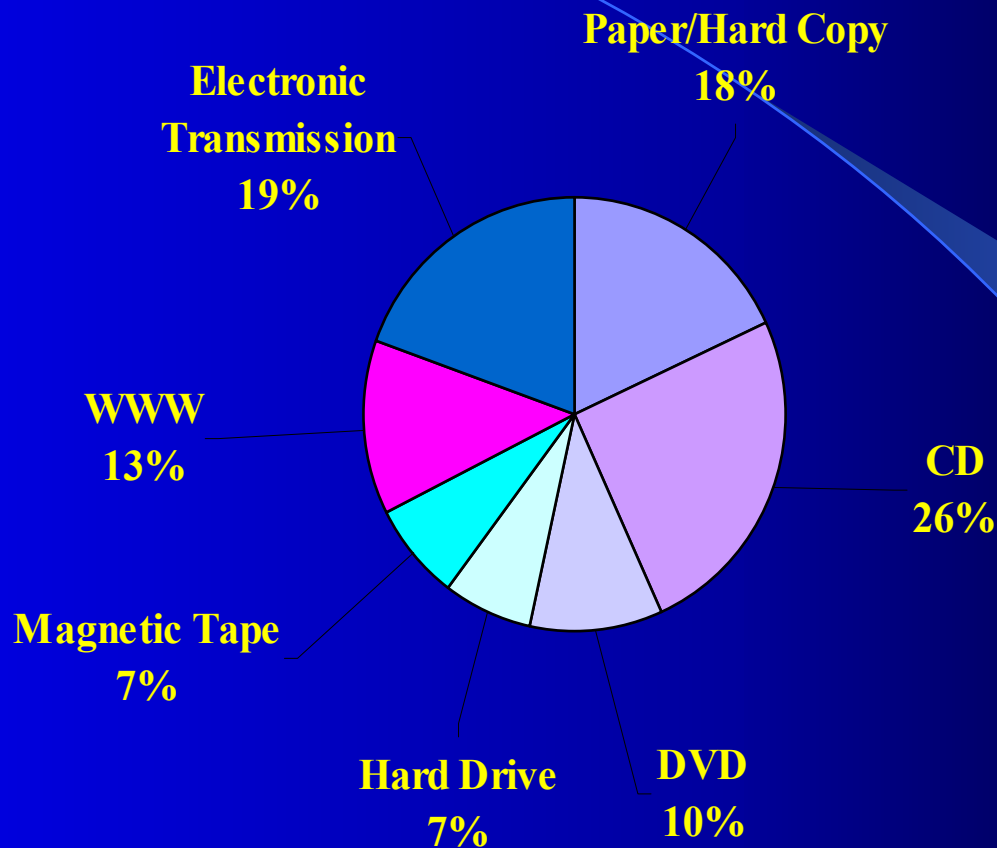
Number of Years Organizations Have Been Producing Geospatial Data/information



- **Indicates Maturity and Growth**

- **Maturity : 60% of firms have produced Geospatial data/information for over 10 years**
- **Growth : 40% of firms have produced Geospatial data/information 10 years or less**

Data Delivery Methods of Producers



- **CD is most common distribution media**
- **Paper/Hard Copy remains significant**

Producers View of Customer/User Technology Awareness

- Importance in Data Delivery

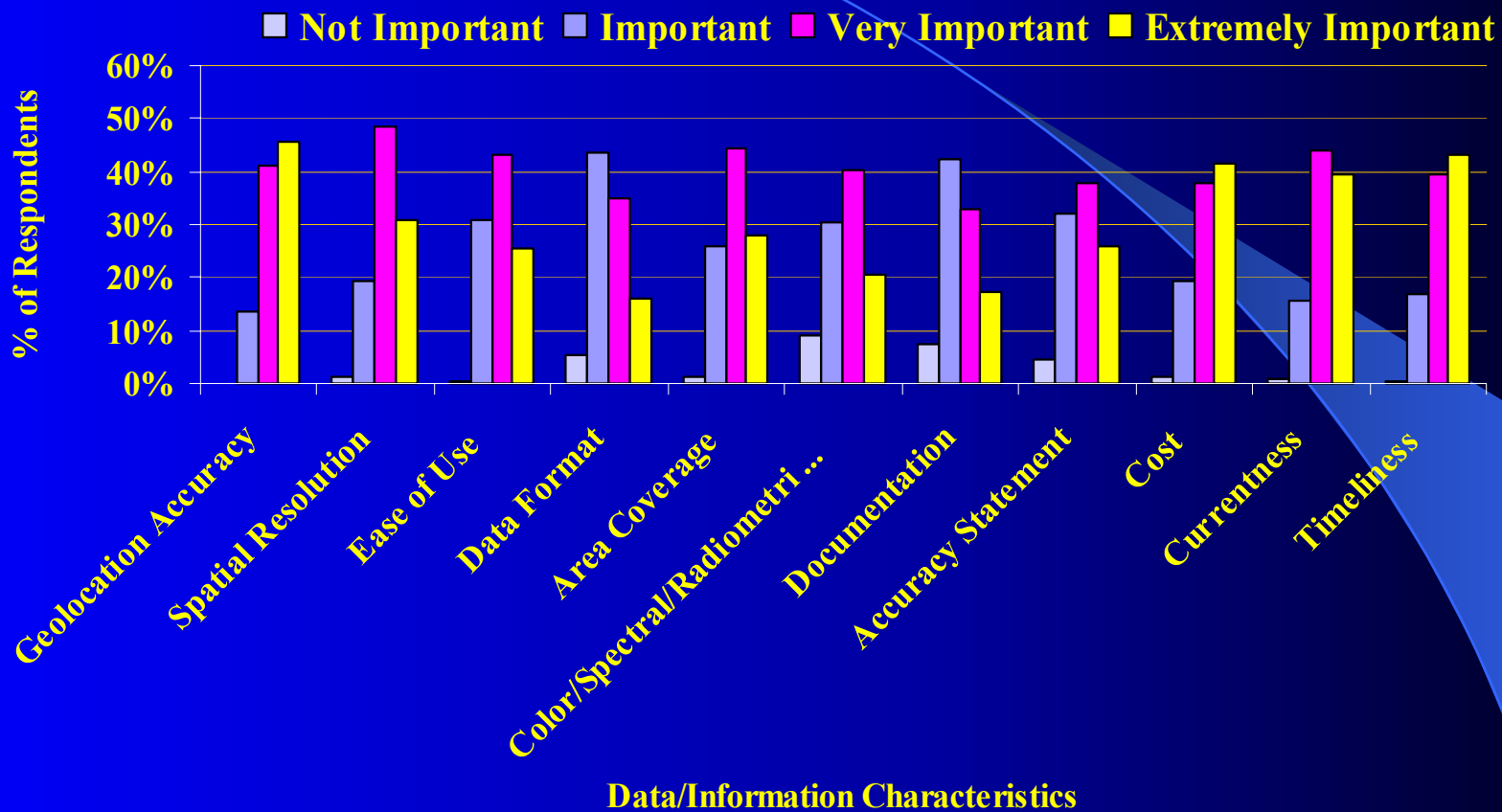
- Importance in Purchase Decisions

Level of Importance	Percent of Producers
Somewhat Important	9%
Important	25%
Very Important	40%
Extremely Important	26%

Level of Importance	Percent of Producers
Somewhat Important	8%
Important	20%
Very Important	48%
Extremely Important	25%

Approximately 75% of Producers agree that customer/user technology awareness is a Very/Extremely important issue.

Importance of Data/Information Characteristics to Producers

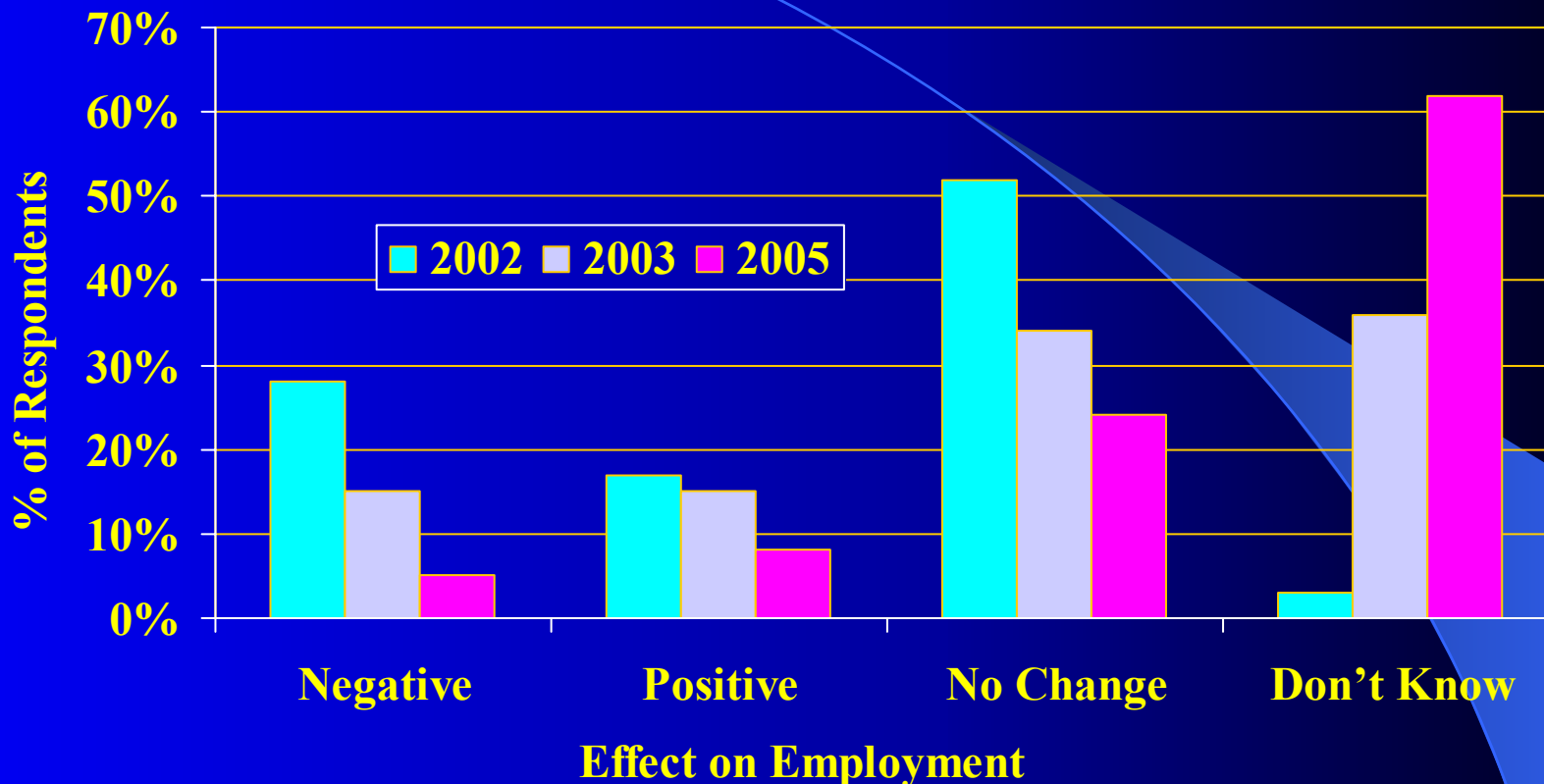


- **Highest Importance: Geolocation Accuracy; Timeliness; Cost; Currentness; and Spatial Resolution**
- **Least Importance: Color/Spectral/Radiometric Quality; Documentation/Metadata; Format; Accuracy Statement**



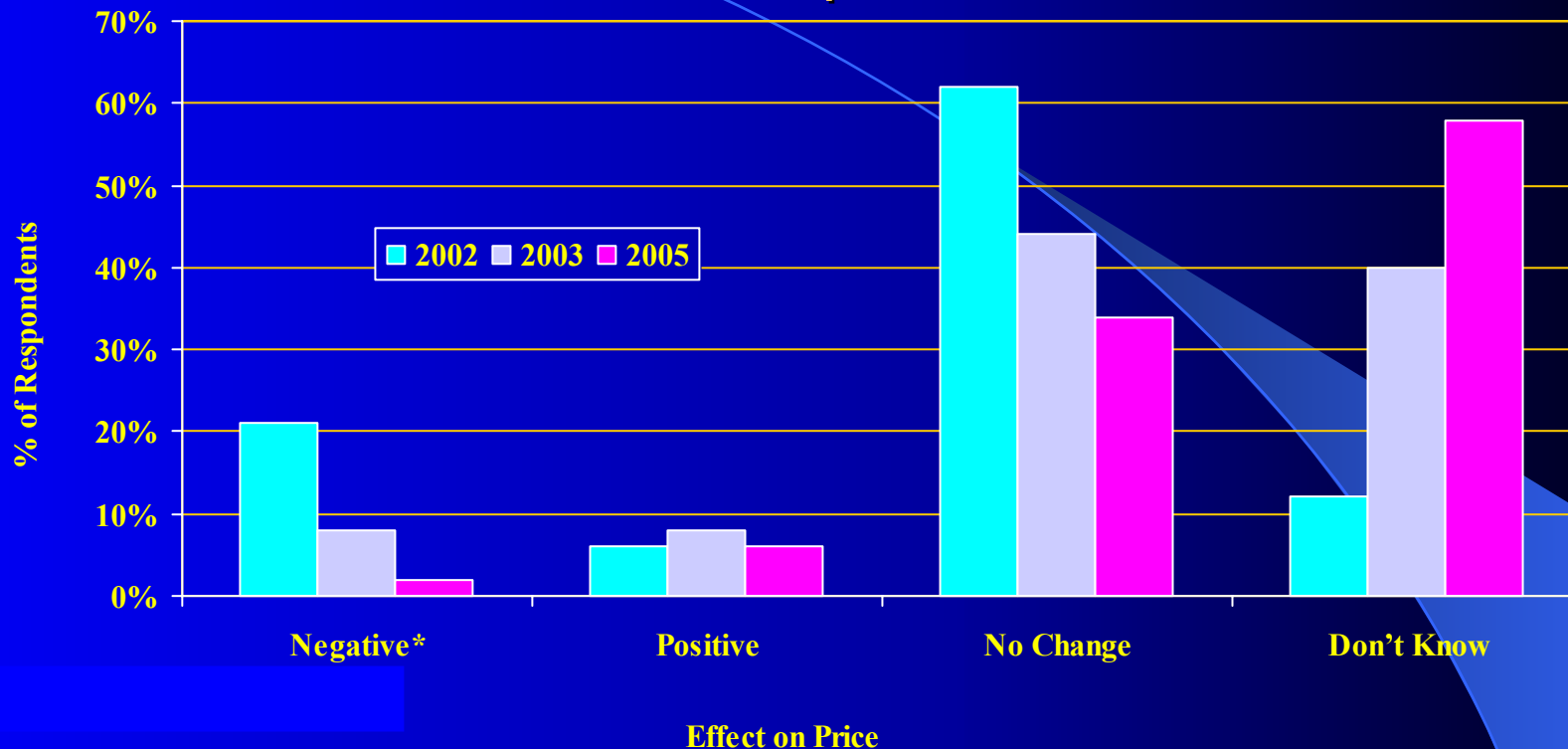
The Following Are Producer Perceptions Concerning the Effects of September 11, 2001

Effects of 9/11 on Employment in Organizations that Produce Geospatial Information



- **2002: Overall, Producers anticipated a slightly Negative effect on employment**
 - 50% anticipated no change;
 - Nearly 30% anticipated a Negative effect
 - Nearly 20% anticipated a Positive effect
- **Out-years: Less Negative but increasing uncertainty (Don't Know)**

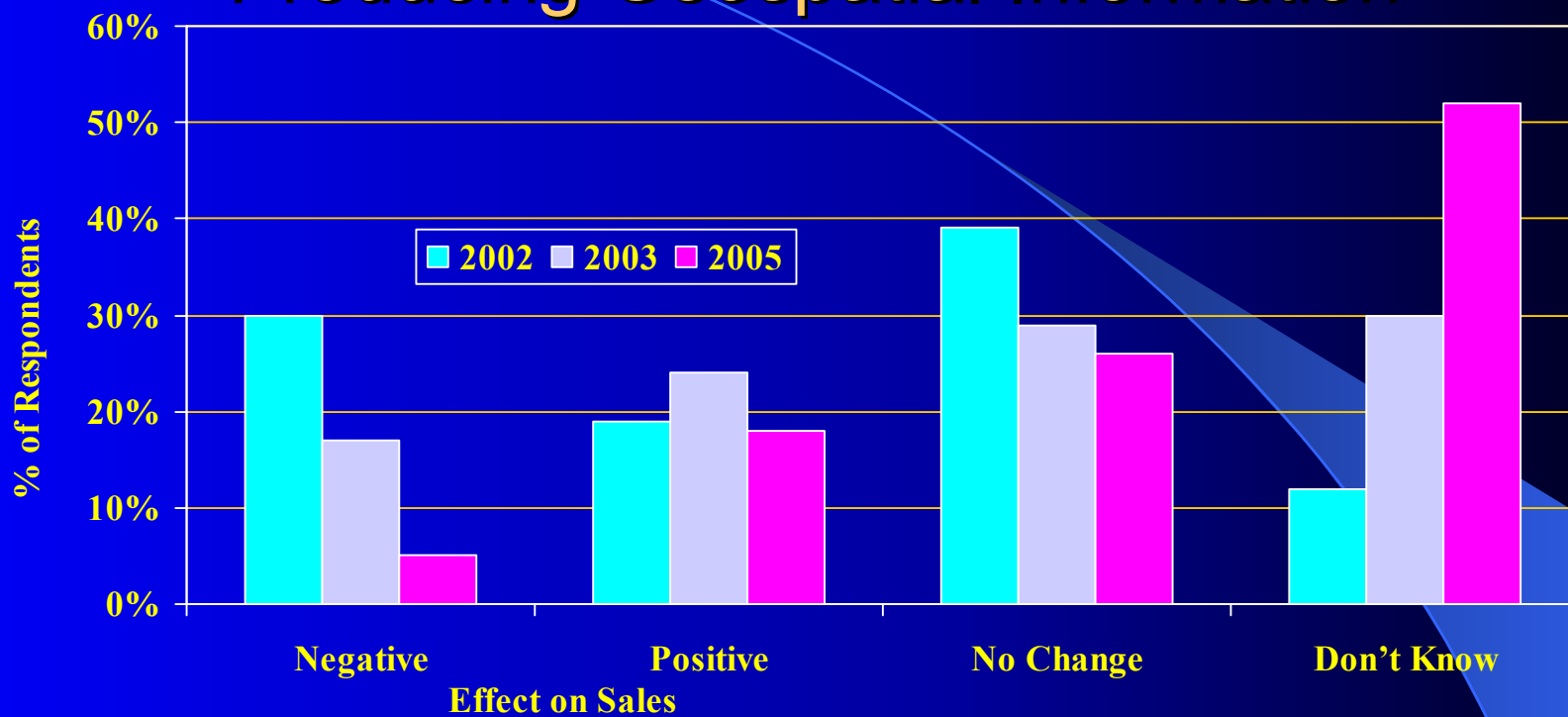
Effects of 9/11 on Product Prices of Organizations that Produce Geospatial Information



- **2002-2005:** The shift toward “Don’t Know” indicates Producers anticipate uncertainty
- **2002:** About 20% of Producers anticipated a negative effect on prices in the near-term
- **2003-2005:** Increasing Uncertainty



Effects of 9/11 on Sales of Organizations Producing Geospatial Information



- **2002: Producers anticipated a more Negative effect on Sales are than Employment and Price**
- **2003: Producers are more positive about sales**
- **2005: Uncertain**

Overall Affect/Impact of Government Restrictions Implemented since 09/11/01 on Producers

Do new government restrictions implemented since 09/11/01 affect/impact your business?

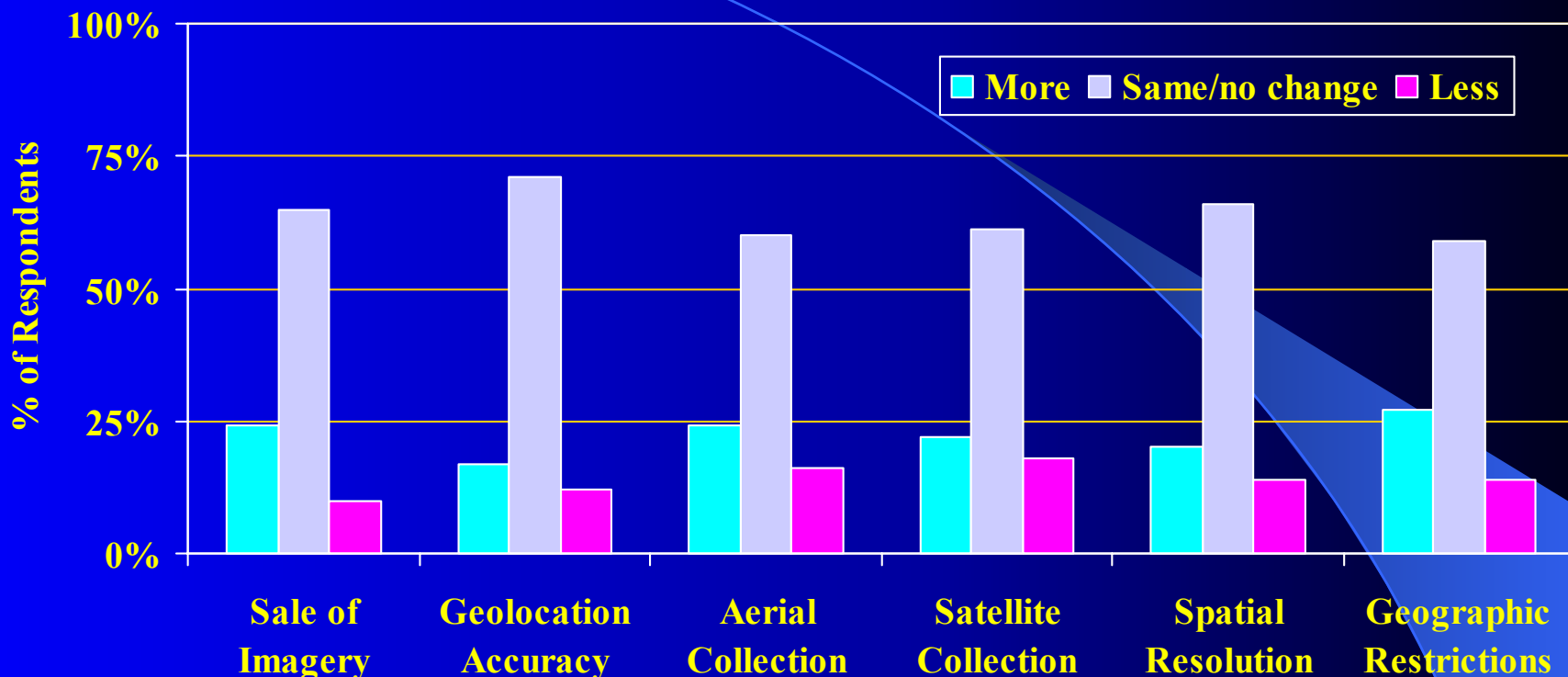
YES	NO
55%	45%

If yes, is the impact Positive or Negative?

POSITIVE	NEGATIVE
20%	80%

Government restrictions implemented since 09/11/01 have had a Negative effect on about 40% the the organizations producing Geospatial data/information

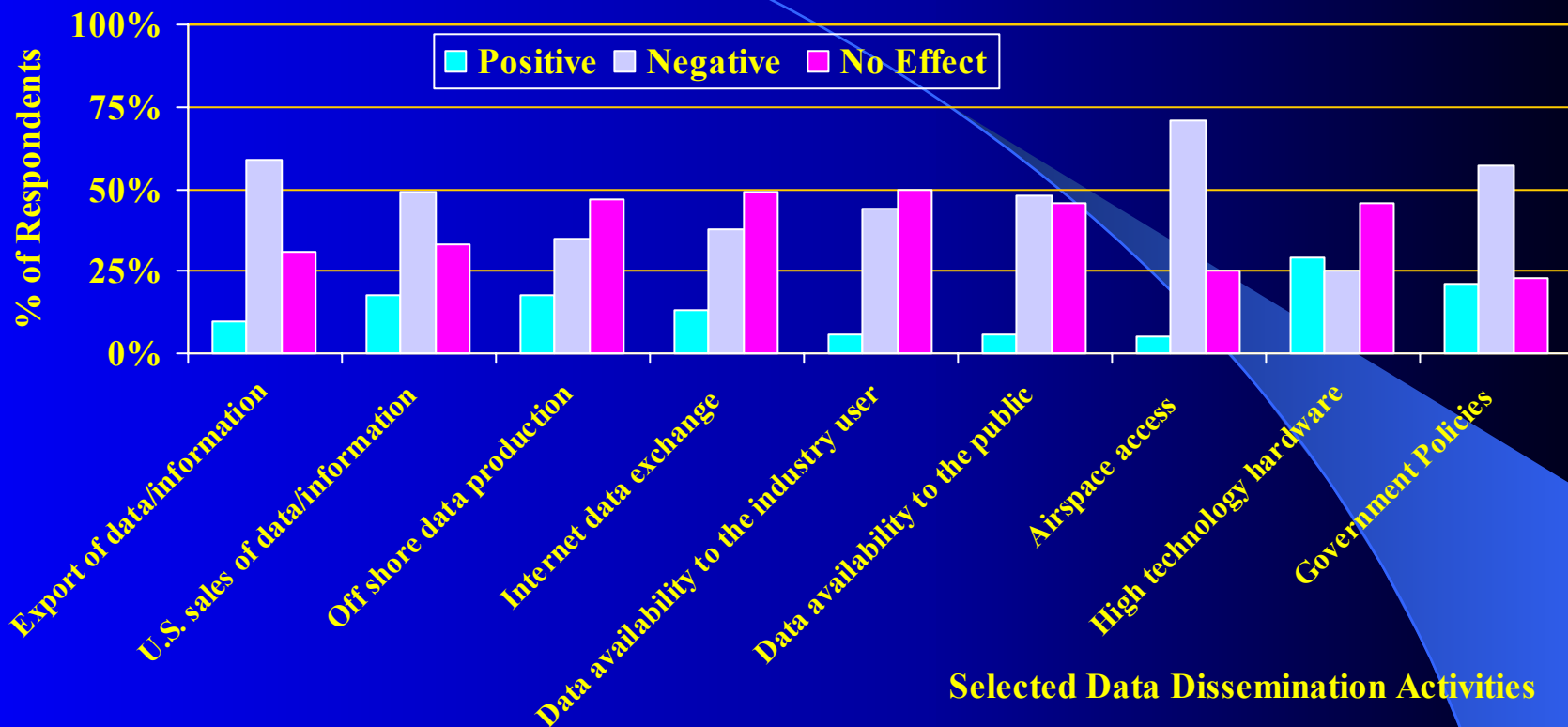
Should Government Change Restrictions ?



Selected Data Collection & Analysis Related Activities

- About 60% of Producers believe current restrictions on activities are about right
- About 20% think more restrictions on their activities are in order
- There are no significant differences between the activities

Producer's 2002 Impact of 9/11 on Selected Data Dissemination* Areas

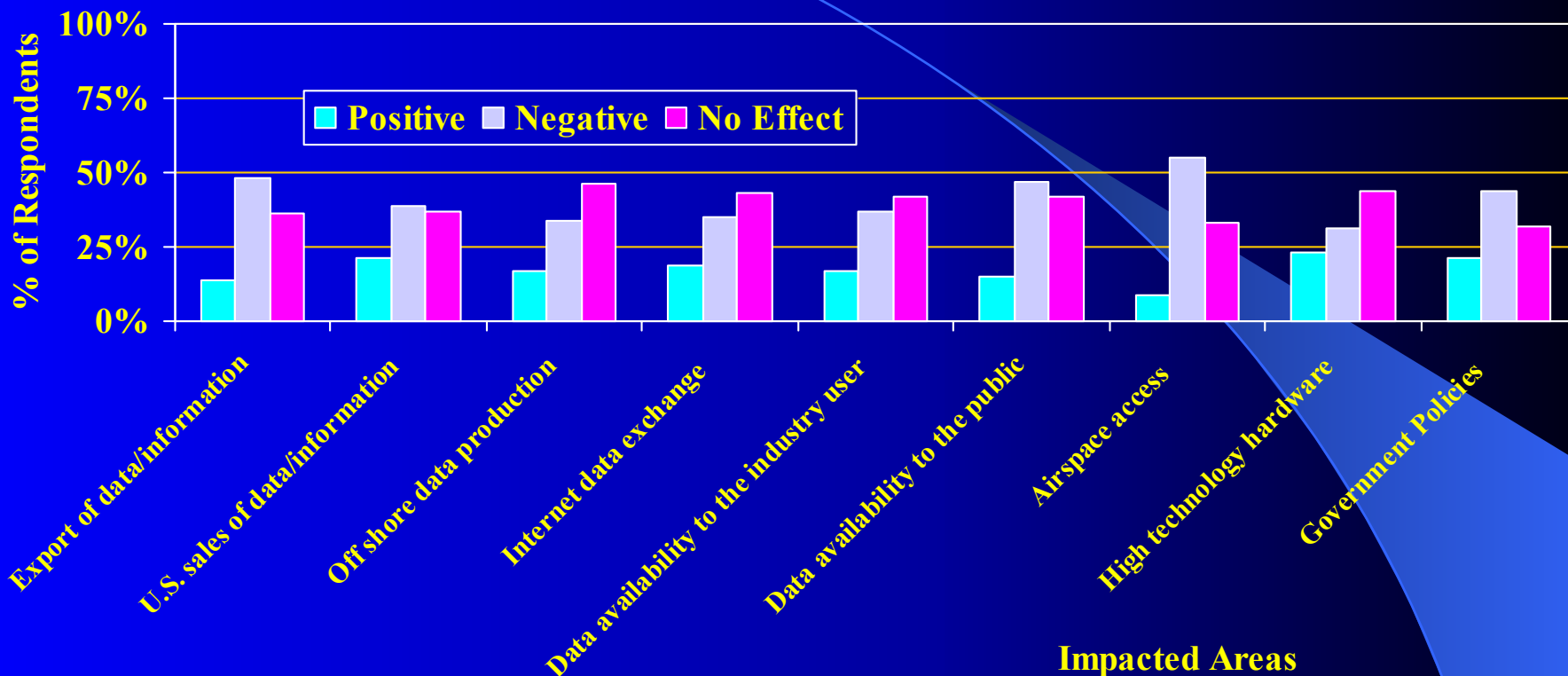


- **More Negative Impacts than Positive**
- **Biggest Negatives: Airspace Access*; Export of Data/Information; Government Policies**
- **There is no significant difference between Geospatial Activities**

* Airspace Access is Data Collection Activity



Future (2005) Impact of 09/11/01 on Selected Data Dissemination* Related Activities



- **Negative effects diminish, but continue**
- **Biggest Negatives: Airspace Access*; Export of Data/Information; Data Availability to Public**
- **Biggest Positives: High Tech hardware; U.S. Sales of Data/Information; Offshore Data Production**
- **Most change: Government Policies**

* Airspace Access is Data Collection Activity

Producer Conclusions

- The age of the organizations indicate:
 - Stability and Maturity: more than 60% over 10 years as producers
- Delivery Method
 - Producers primary delivery method for Geospatial data/information is via CD although hard Copy remains a significant factor
- About 75% of Producers agree that customer/user technology awareness is a Very/Extremely important issue with regard to data delivery
- Data/information Characteristics
 - Highest Importance: Geolocation Accuracy; Timeliness; Cost; Currentness; and Spatial Resolution
 - Least Importance: Color/Spectral/Radiometric Quality; Documentation/Metadata; Format; Accuracy Statement

Producer Conclusions

Effects of 09/11

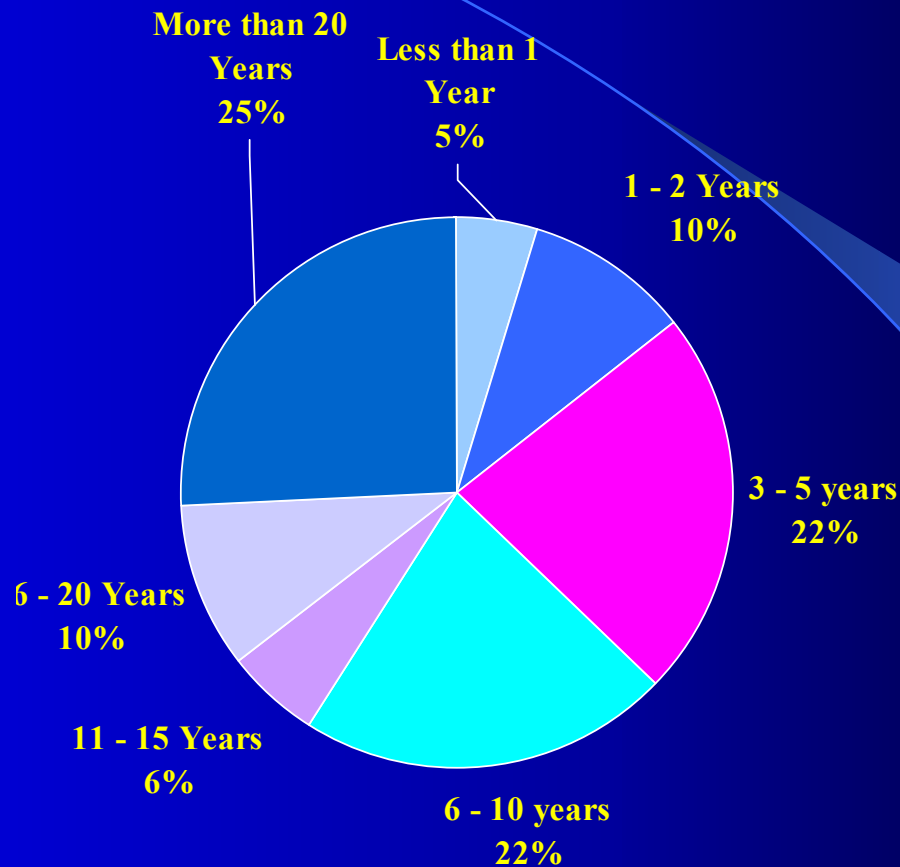
- Employment:
 - Producers anticipated a slightly Negative effect on employment 2002
- Producers anticipated a negative effect on prices in the near-term
- Sales:
 - 2002 Sales expectations are more Negative than Employment and Price
 - About 30% anticipated a Negative effect on sales
- Government Restrictions have had a Negative effect on about 40% the producers
- Restrictions on Selected Data Collection and Analysis Related Activities
 - 60% of Producers believe current restrictions are about right
 - 20% think more restrictions on their activities are in order
- Impact of 09/11/01 on Selected Data Dissemination* Related Activities
 - 2002 More Negative Impacts than Positive, But negatives diminish by 2005
 - Biggest Negatives: Airspace Access; Export of Data/Information; Government Policies

•Airspace Access is not a Data Dissemination Activity, but was included in this grouping



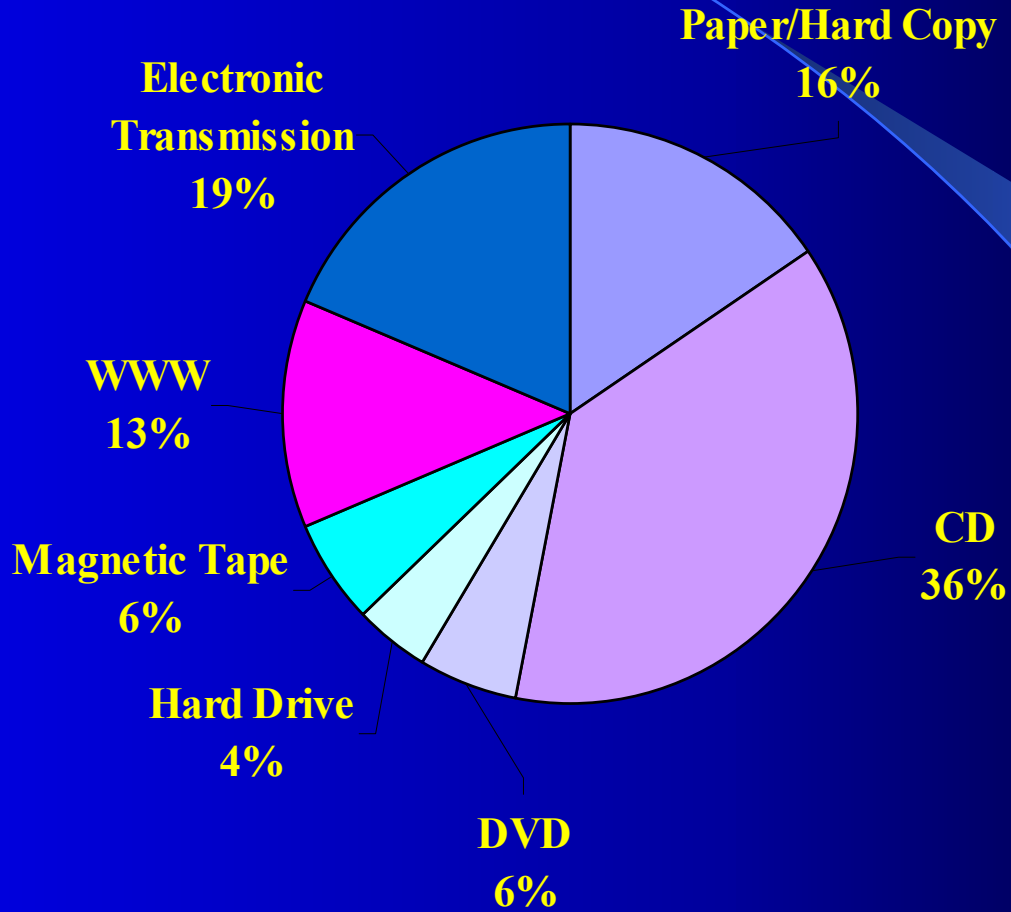
User

Number of Years Organizations Have Been Using Geospatial Data/information



- **Approximately 60% Using Geospatial data/information for 10 years or less**

Data Receiving Methods for Users





User Satisfaction with Providers Explanation of Geospatial Data/Information

Level of Satisfaction	Percent of Users
Not Satisfied	24%
Satisfied	62%
Very Satisfied	13%
Extremely Satisfied	2%

Only 15% of Users are “Very/Extremely Satisfied” with Provider performance in this regard



Comparison of Importance of Data/Information Characteristics: Producers vs. Users

- Combining “Very & “Extremely Important”

Top 5 Producer Characteristics	Top 5 User Characteristics
Geolocation Accuracy	Geolocation Accuracy
Currentness	Spatial Resolution
Timeliness	Currentness
Cost	Cost
Spatial Resolution	Timeliness

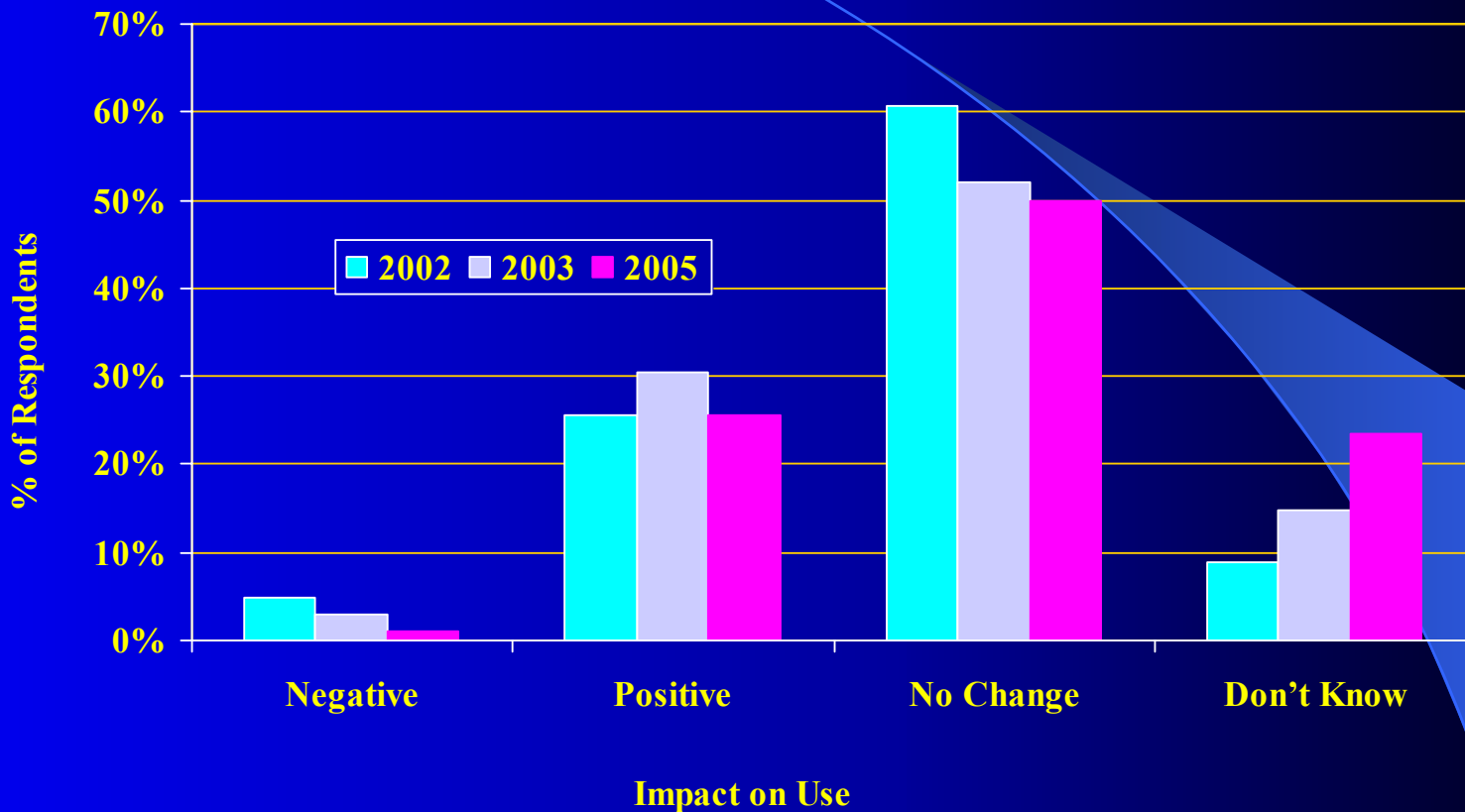
- This compares favorably with findings in Phases I & II



The Following Present User Perceptions Concerning the Effects of September 11, 2001

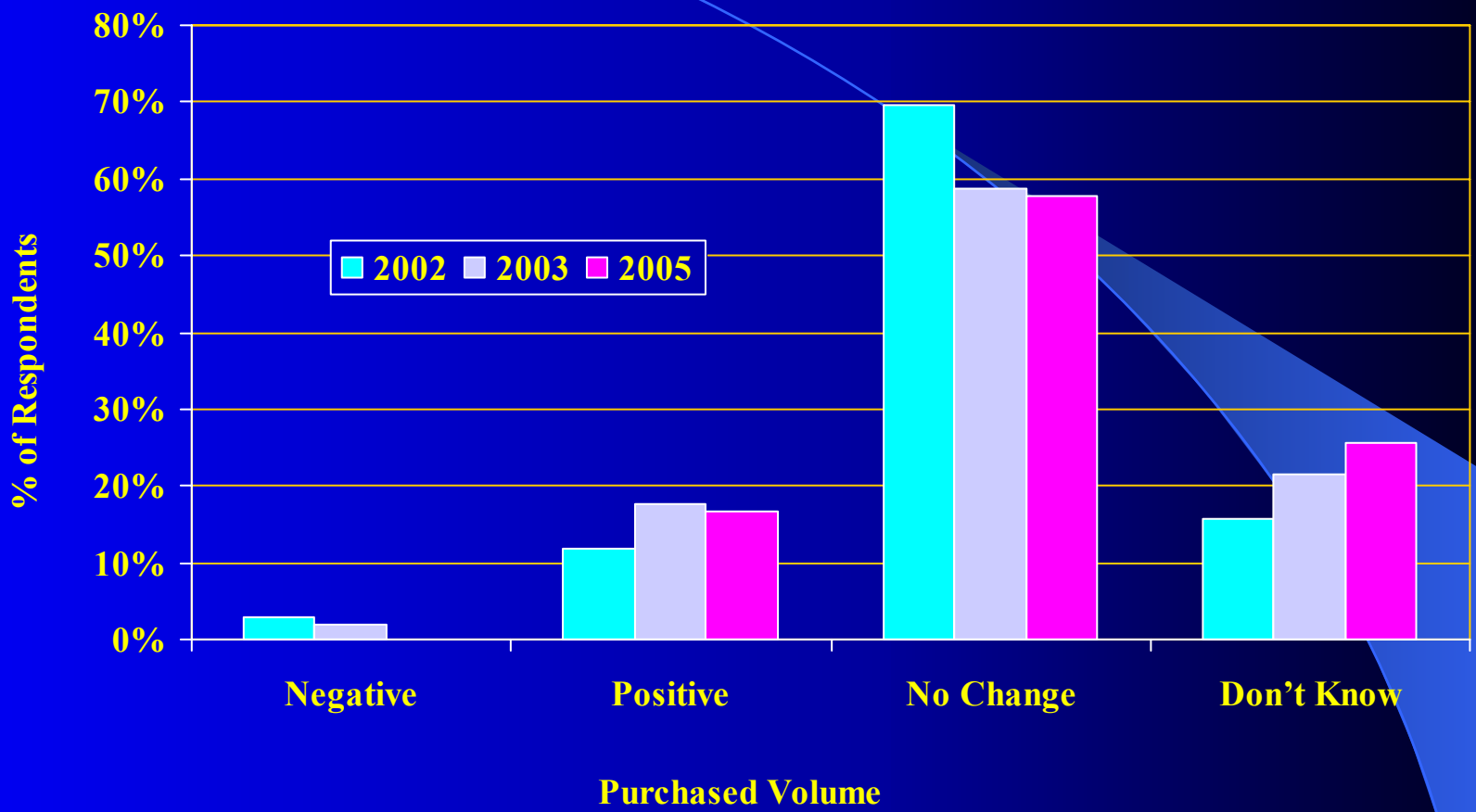
User View of the Impact of 9/11 on Their Use of Geospatial Data/Information

User



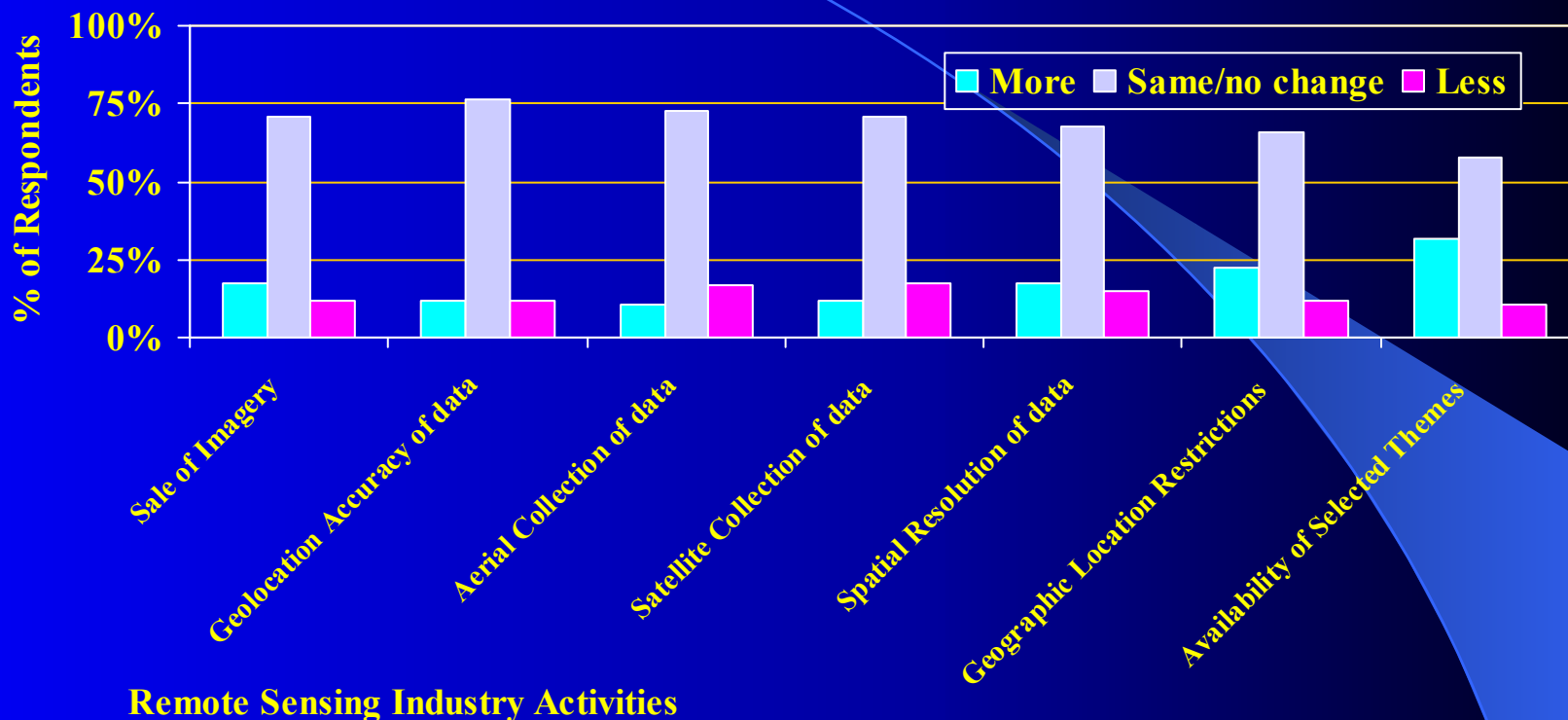
Users anticipate more stability and positive impact on *their* use of Geospatial data/information between 2002 to 2005

Effect of 9/11 on User Purchase Volume of Geospatial Data/Information



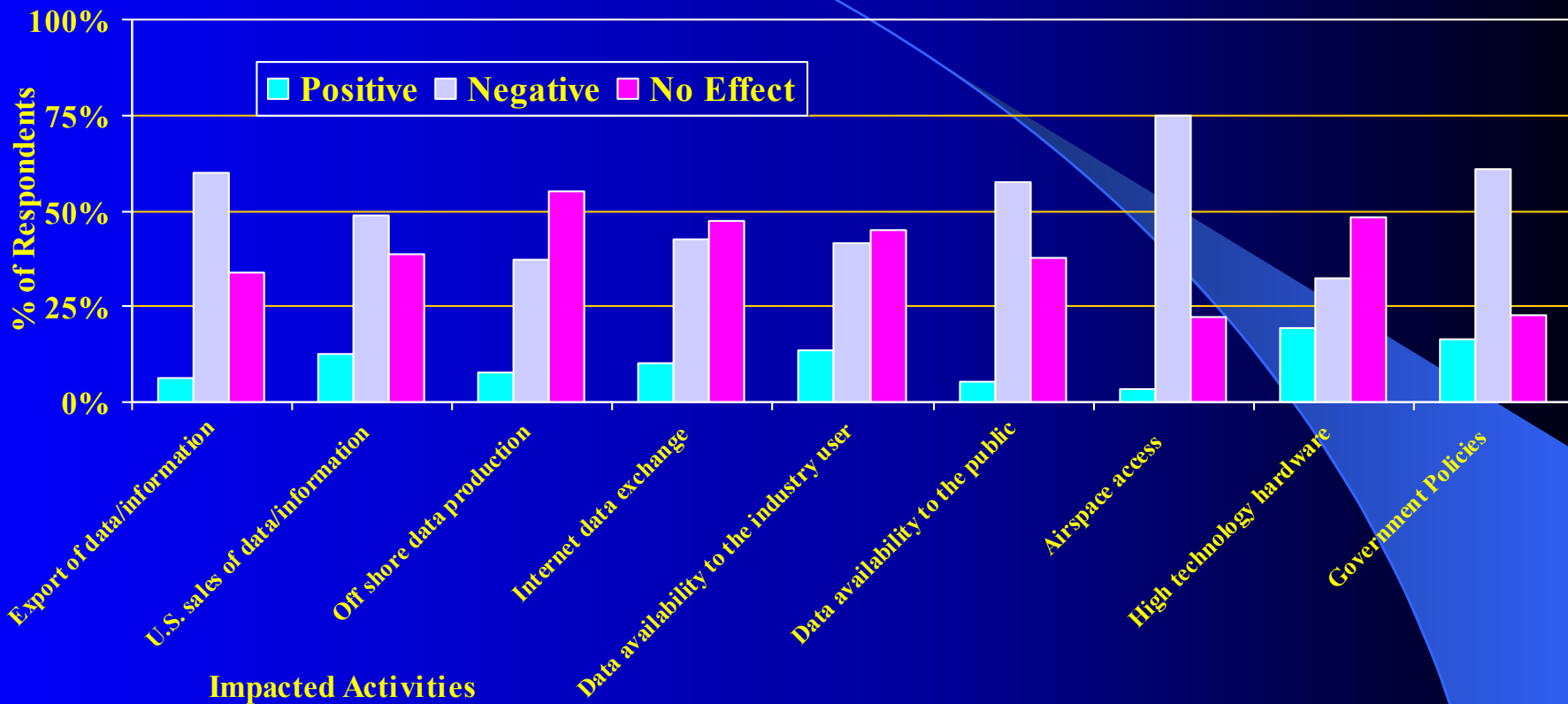
● Not as Positive as the Use data, but, overall strong indication that purchase volume will not go down

Should Government Policy Place more or less Restrictions Selected Specific Remote Sensing Industry Activities?



- **Very similar to producers view**
- **About 65% of Users believe current restrictions on Remote Sensing are about right**
- **A fairly number think more restrictions on their activities are in order**

User Perspective: Current Impact of 09/11/01 on Selected Remote Sensing Industry Areas



- Far more Negative Impacts than Positive
- Biggest Negatives: Airspace Access; Export of Data/Information; Government Policies; Data Available to General Public



User Conclusions

- User data tends to confirm that this is a mature and growing Industry
- We believe the User purchases and Producer Sales will be stable after 2003 and will continue their current growth trends
- CD is the largest data delivery method but does not seem on the verge of fully displacing other methods
- Users view their knowledge of products and technology as far less important than Producers; however only about 15% are “Very/Extremely Satisfied” with Provider explanations
- Users of Photogrammetry and Image Based GIS products indicate Geolocation Accuracy is the most important Characteristic; for Remote Sensing Users its Color/Spectral/Radiometric Quality



User Conclusions

- The rank ordering of the most important Geospatial data/information characteristics changes due to Phase objectives and responses groups, but the identity of the characteristics remains constant all Phases:
 - Geolocation Accuracy
 - Cost
 - Spatial Resolution
 - Currentness/Timeliness
- It is interesting to note that, as in earlier Phases, Cost is important but when asked to select the most important respondent they select other characteristics. This indicates that, while cost is a factor, information content is what drives User choice



User Conclusions

● 9/11/01

- Users anticipate a far less negative impact of on their use of Geospatial data/information between 2002 to 2005
- Users anticipate purchases will be fairly positive and stable
 - No significant differences between Image-based GIS, Photogrammetry and Remote Sensing
- Regarding restrictions, Users again are very similar to producers
 - About 65% of Users believe current restrictions are about right
 - A number think more restrictions on their activities are in order

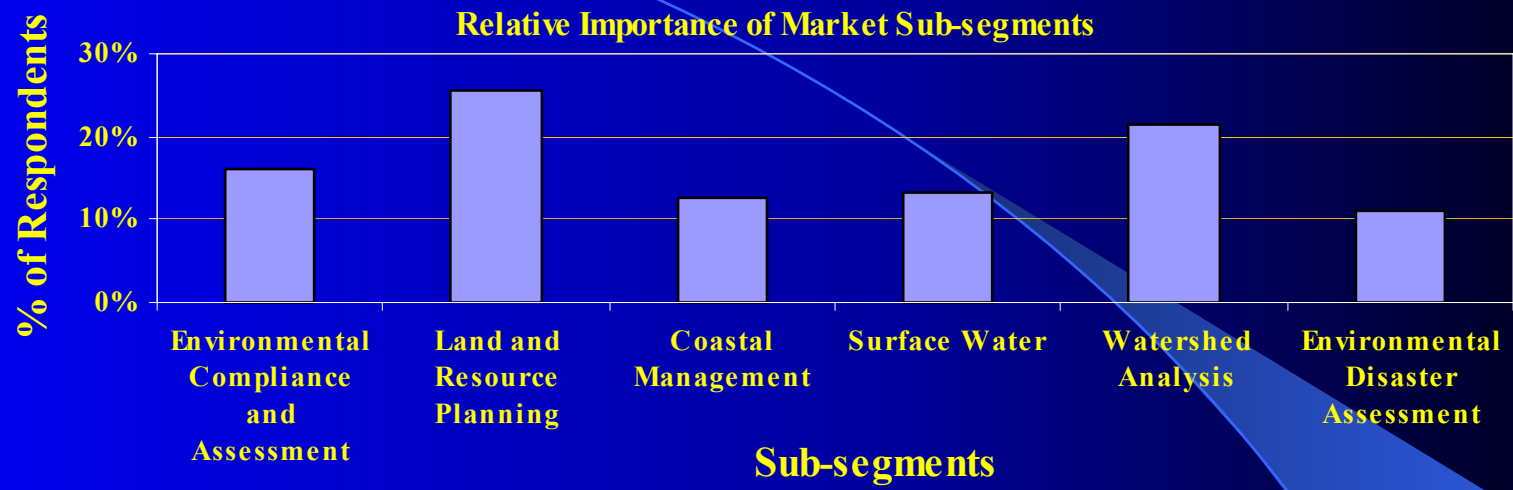


VERTICAL MARKET SUBSEGMENTS

10 Year NASA/NOAA/ASPRS Forecast

Rabin/Mondello

Environmental



Type of Geospatial Data Used		Producer or User?		Environmental Respondents Sectors	
Image Based GIS	35%	Producer	73%	Academic	38%
Photogrammetry	0%	User	27%	Commercial	24%
Remote Sensing	65%			Government	38%

- Environmental ranks 2nd in Importance among the Market Segments in Phase III
- In the Environmental segment, Remote Sensing is the Geospatial data/information of choice
- Over 70% of Government respondents are at the Federal level
- The most important sub-segments are Land and Resource Planning and Watershed Analysis
 - In this sub-segment, about two-thirds of respondents believe that their needs fairly well met



Environmental

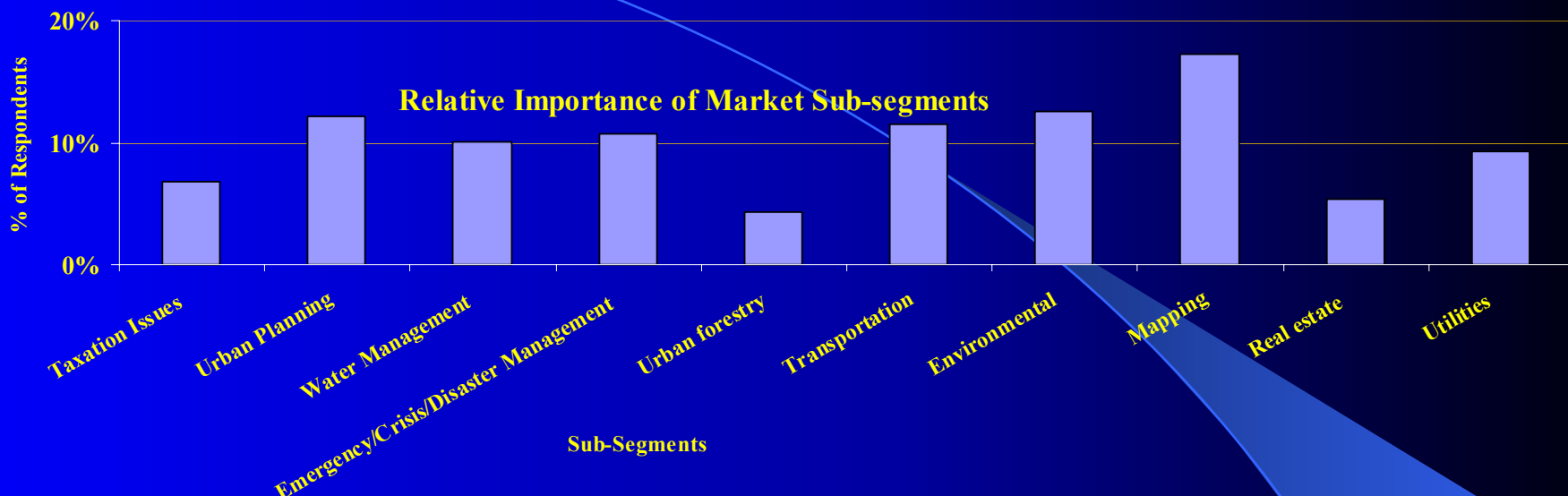
Producers

- Dominate the sample
- Bi-modally distributed. Most have been producing data/information for either 6-10 years or more than 20 years
- Civil Government producers feel that the technological awareness of users is very important in terms of being able to deliver data
- Currentness and spatial resolution are the most important data characteristics to the Civil Government producers

Users

- **Have been working with Environmental data/information from 3 - 10 years.**
- **Primary methods for receiving data/information are CD & Paper/Hard copy.**
- **Believe product knowledge is important to very important with regard to increasing its use in their work.**
 - **Split about 50%-50% over satisfaction with adequacy of providers explaining how to best use data/information products**
- **Geolocation Accuracy and Cost of data are the most important data/information characteristics to Environmental users.**

Civil Government



Type of Geospatial Data Used		Producer or User?		Civil Government Respondents Sectors	
Image Based GIS	50%	Producer	63%	Academic	4%
Photogrammetry	27%	User	37%	Commercial	46%
Remote Sensing	23%			Government	50%

- **Civil Government ranks 3rd in Importance among the Market Segments in Phase III**
- **The most important subsegment is mapping**
 - Respondents believe that their needs are mostly (75%) to fully (15%) met in this subsegment
- **Over 70% of Government respondents are from Local level (about right in terms of locus of activity)**
- **It appears that the Commercial and Government Sectors are producing about the same amount of Geospatial data/information**

Civil Government

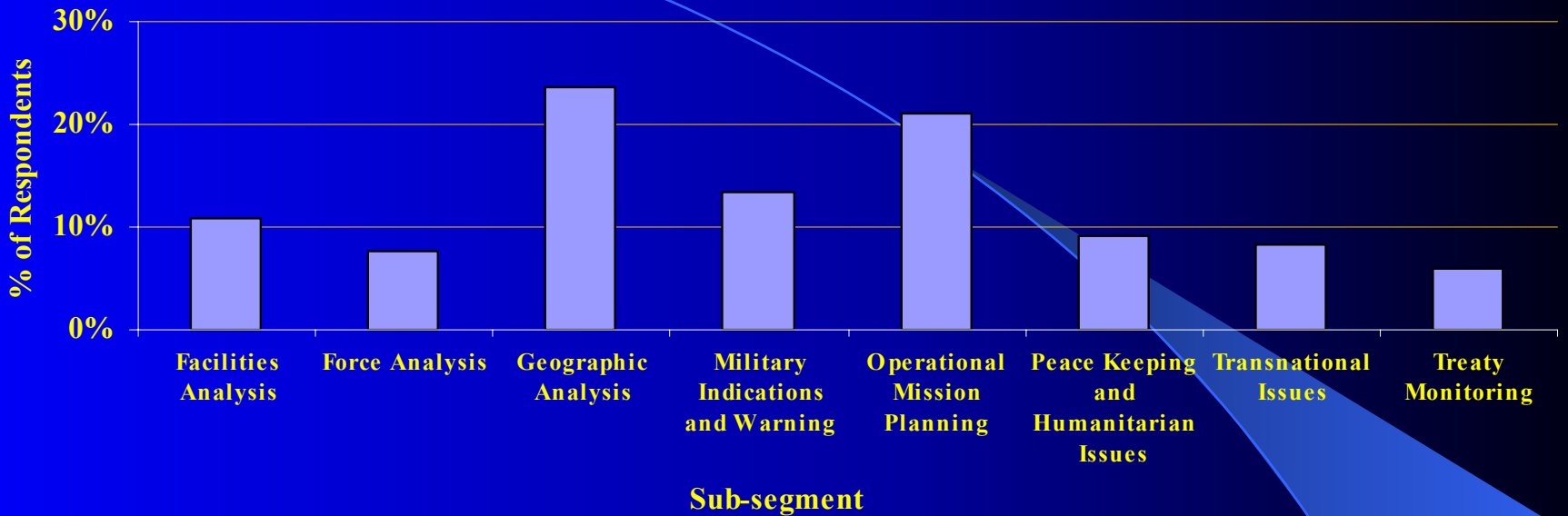
Producers

- Organizations are bi-modally distributed; most have been producing data/information for either 3 –5 years or more than 20 years.
- Believe that the technological awareness of the users is important to very important in terms of being able to deliver data
- Cost and Geolocation Accuracy are the most important data characteristics

Users

- Insufficient Sample

National/Global Security/Defense



Type of Geospatial Data Used		Producer or User?		National /Global Security/Defense Sectors	
Image Based GIS	35%	Producer	79%	Academic	3%
Photogrammetry	12%	User	21%	Commercial	53%
Remote Sensing	53%			Government	44%

- National/Global Security/Defense is ranked 4th among the market segments
- 100% of the respondents from government were from the Federal level
- Geographic Analysis / Operational Mission Planning are the most important subsegments to this group
- Respondents believe that their needs are mostly (63%) to fully (25%) met in this subsegment



National/Global Security/Defense

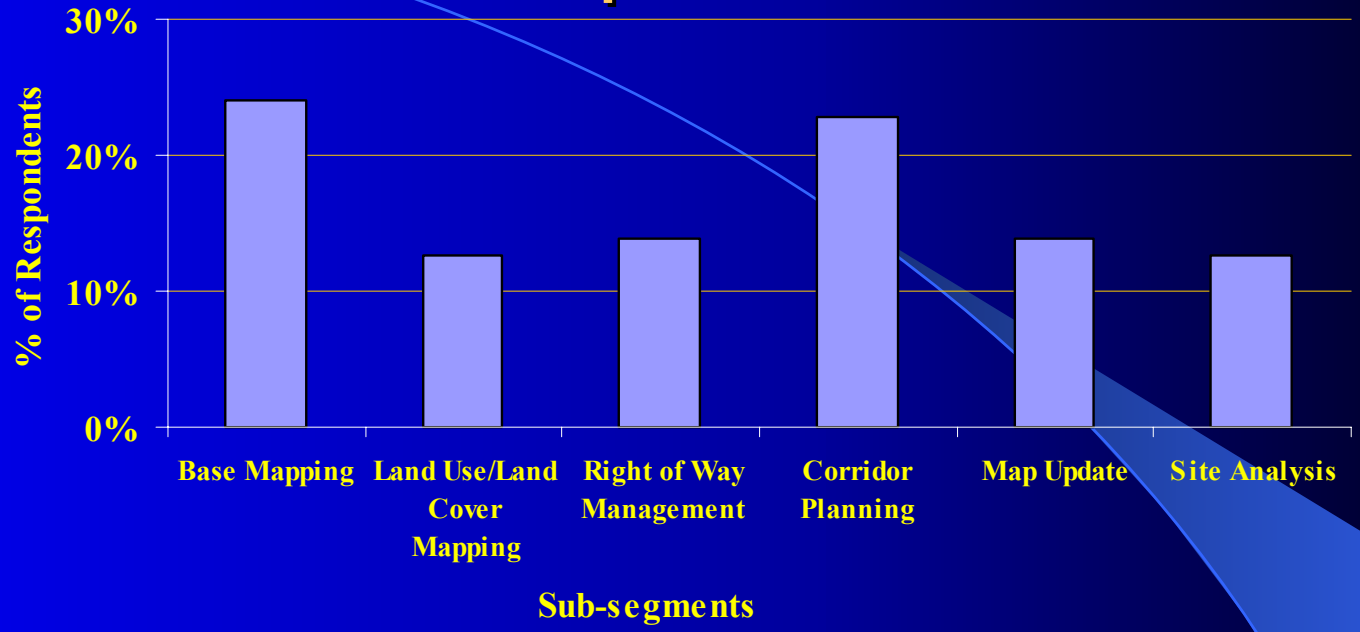
Producers

- All Government responses are from Federal level
 - The majority of Federal organizations in the National/Global Security/Defense market segment have been working there for more than 20 years
- Producers feel that the technological awareness of the users is very important to extremely important in terms of being able to deliver data
- Spatial Resolution is the most important data/information characteristic

Users

- Insufficient Sample

Transportation



Type of Geospatial Data Used		Producer or User?		Transportation Respondents Sectors	
Image Based GIS	20%	Producer	64%	Academic	4%
Photogrammetry	76%	User	36%	Commercial	28%
Remote Sensing	4%			Government	68%

- **Transportation is ranked 5th among the market segments**
- **Nearly 80% of respondents in Transportation work at the State level**
- **The most important subsegments are Base Mapping and Corridor Planning**
 - **Respondents needs are mostly (46%) to fully (31%) met in base mapping**
 - **Respondents needs are partially (38%) to mostly (50%) met in corridor planning**



Transportation

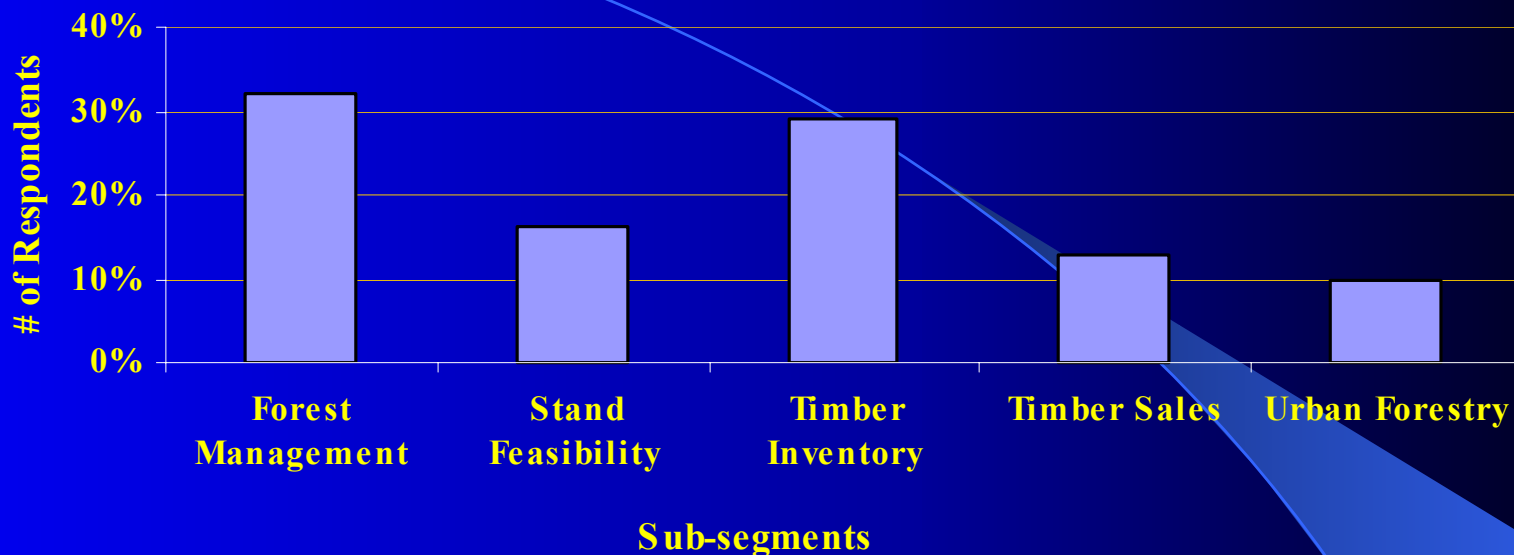
Producers

- Geolocation accuracy is the most important data/information characteristic for the Transportation market segment
- User Needs in Corridor Planning are not as well met as in other sub-segments

Users

- Insufficient Sample

Forestry



Type of Geospatial Data Used		Producer or User?		Forestry Respondents Sectors	
Image Based GIS	25%	Producer	58%	Academic	17%
Photogrammetry	33%	User	42%	Commercial	17%
Remote Sensing	42%			Government	67%

- Forestry is ranked 7th among the market segments
- Over 60% of respondents are from Federal Government
- The most important sub-segments are Forest Management and Timber Inventory

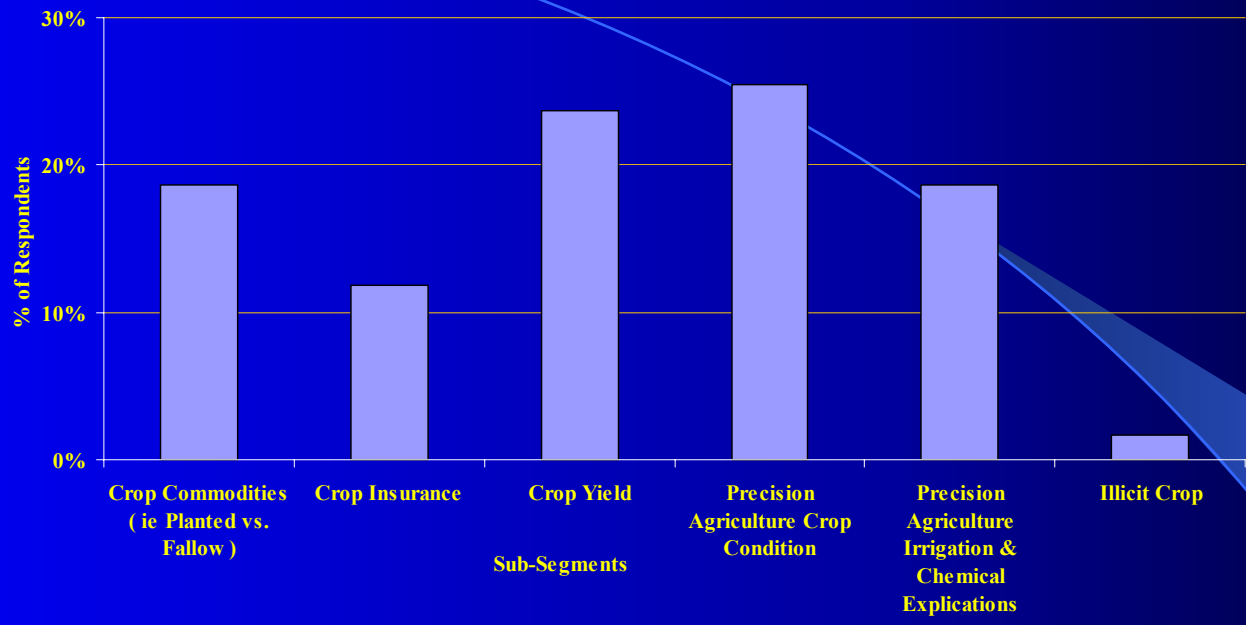
Producers

- The majority of those in the Forestry market segment have been working there for more than 20 years.
- Forestry producers feel that the technological awareness of the users is very important in terms of being able to deliver data.
- Ease of use/integration, color/spectral/radiometric quality; and currentness of data are the most important characteristic.

Users

- **Insufficient Sample**

Agriculture



Type of Geospatial Data Used		Producer or User?		Agricultural Respondents Sectors	
Image Based GIS	17%	Producer	83%	Academic	39%
Photogrammetry	0%	User	17%	Commercial	33%
Remote Sensing	83%			Government	28%

- Agriculture ranks 6th in importance among the Market Segments in Phase III
- Chart depicts the uniform distribution between most of the major sub-segments
- 100% of the Government respondents are at Federal level
- Remote Sensing is by far the most used type Geospatial data/information

Agriculture

Producers

- **Maturity of the organization is bimodally distributed; most have been producing agricultural data/information for either 3 –5 years or more than 16 years**
- **Agriculture data/information producers believe that the technology awareness of the users is important to very important in terms of being able to deliver data**
- **Cost and Timeliness are the most important data characteristics to the Agricultural producers**

**Producers (83%)
Dominate the Sample**

Users

- **Most users organizations have been working with Agricultural data/information from 3 - 10 years**
- **Most Agricultural respondents think that additional product knowledge would increase their use of geospatial data/information and were satisfied that providers did an adequate job of explaining how to best use it**
- **Cost and currentness of data are the most important data/information characteristics to Agricultural users**
- **Primary methods for receiving data/information are both CD and Paper/Hard copy**