Geospatial Data Governance – It's a Strategy not a Project!

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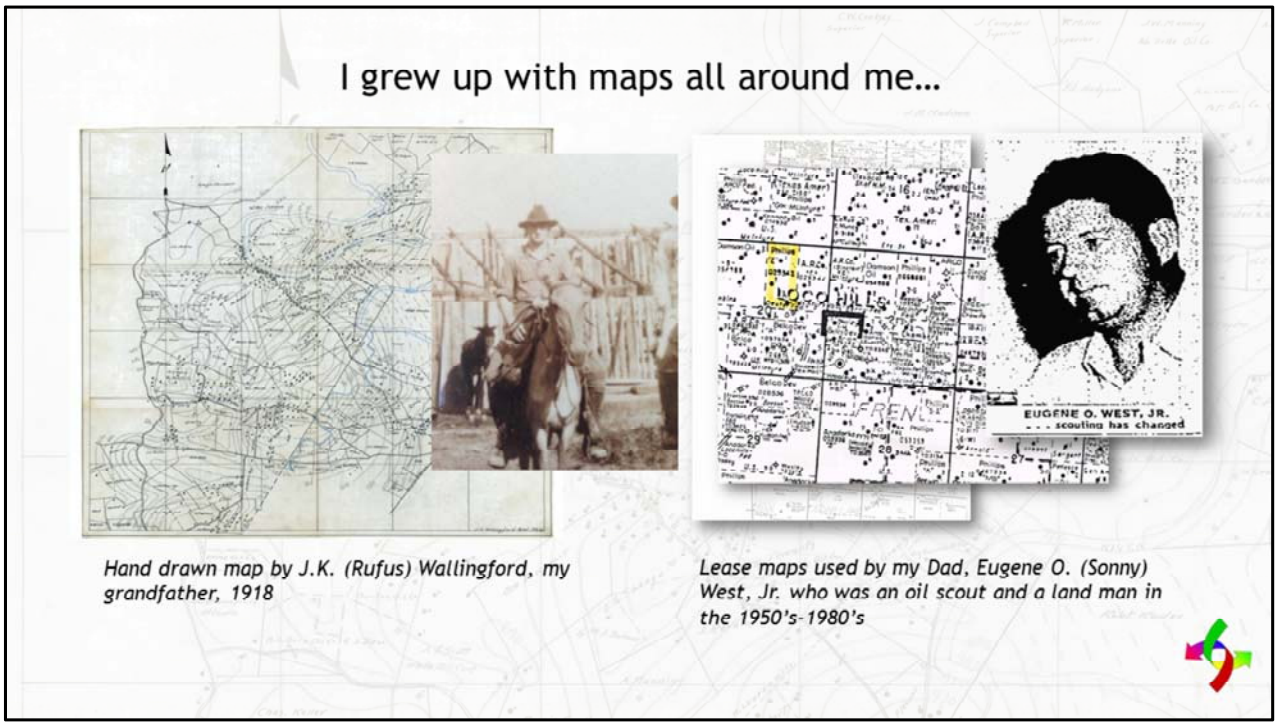
Welcome! For starters, this presentation will require your attention and participation. It is NOT a technical presentation. We will be discussing strategy. We have a lot to cover, so I will press on…

My name is Ellen Nodwell. I am with IntegraShare Solutioneering. This is my first SCAUG! I am happy to be here. I should apologize for not getting involved with this great group of people earlier. Not being able to be two places at once is my worst enemy!

I have a passion for GIS! I have used several GIS technologies, but Esri remains my favorite, as it continues to evolve in the directions that meet the needs of the world, better than any. Did you enjoy hearing Jack's update? Wow!

I have many interests and my interests in all things geospatial continue to grow as it is a fascinating technology that continues to evolve in compelling ways.



For the most part, in our immediate family, maps have historically been important to us, and still are.

The maps on this slide are actual images of maps used by my grandfather and my father in their work.

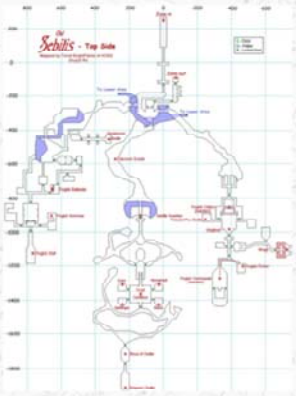
My grandfather, on horseback, in 1920, was working as a geologist on a project in Mexico. Maps were critical to his non-technical world.

My dad was a landman – from the 1950's until he retired in the 1980's, maps were a primary expression of where he did his negotiations with people for rights to drill and produce petroleum. He did a lot of communicating with maps.

Again, at in those days, maps were still "hand-drawn" with great precision. Their business depended on it. There is lots of "data" behind those maps… Just not "computer data"…

The use of maps has continued in our family.

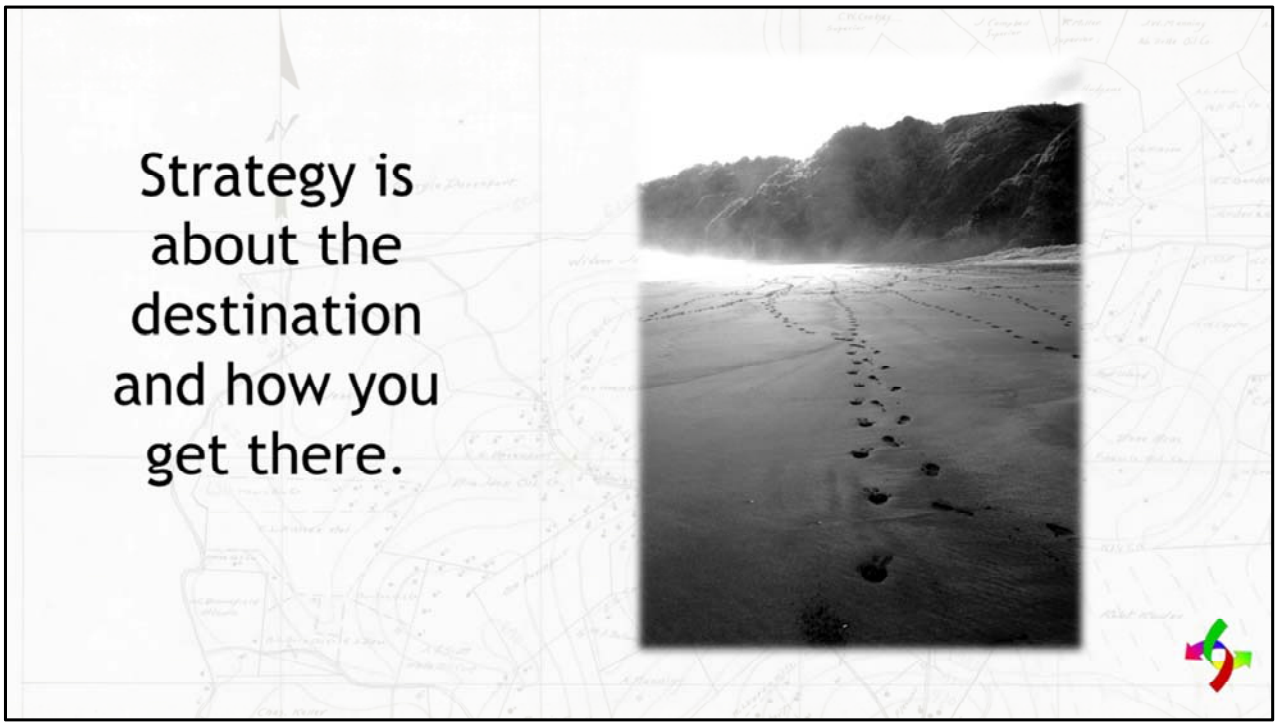
My son, Will (*on left above*) , is now getting a GIS degree, here at Brookhaven.



Maps used by my son, Rob (*on right in picture to left*), for playing "World of Warcraft"

My two sons have both used maps, and one is now a GIS guy. My son, Will, is in flight in his GIS certification, which always gives us something we can discuss! My younger son, Rob, used maps to play (and win) World of Warcraft, when he was alive. We are mappers! My husband and I met because of GIS, and now we base our business on helping others using GIS.

Mapping has been important in my life. For the most part, in our immediate family, we have all been and some of us still are, mappers of some type – GIS gives us a better way to utilize mapping for decision making.



Let's talk about what strategy IS. You have to envision your destination, then figure out how you are going to get there.

Strategy is about understanding the journey, and making the map to reach your points of focus and attain your goals.

If you do not have a strategy **and a road map**, you could get lost!

Projects are different. They are shorter term, and part of a program of strategic execution. We can do many projects in our strategic execution to meet our goals, every year – under our strategy.

To level set, let's have everyone in the room think about your GIS as it is today…
Let's not deviate and think about someone else's GIS… just your organization's GIS…

How does your organization use your GIS?

1. To reach business goals?
2. To support business strategy?
3. To do work more efficiently?
4. To serve customers?
5. To save money?
6. To do better business?
7. Is our GIS standing up to these demands?
8. How does our GIS data measure up?
9. Do we trust our geospatial data?

If not, why not?

Let's consider.

How does your organization use GIS? Look at this list. Is something missing? Anyone? Look at item #9. Knowing that our data may be published as "open data", how do we feel about that? Do we have that confidence in our geo-information that is published for consumption?

How do we find our GIS users feel about our geospatial information?

- Happy?
- Satisfied?
- Productive?
- Getting along harmoniously when it comes to the use of geospatial data?

Or…

Let's think about your users of your geospatial data – your consumers, analysts, and business people…

Ever feel like when something goes wrong with the data, you are in a storm or worse? Yep, and it seems like it is always Monday morning, or late Friday afternoon!

It can happen in one phone call! It's like someone dropped a big mess in the middle of the room that is stinky and makes everyone want to pull out their hair and scream!

Talk about a chaotic situation! That will drive our blood pressure up, yes!? Raise your hands if you have struggles with your geospatial data.

You are not alone in your experience. Let's face it. This happens to most everyone in our profession.

We have to answer many questions about our geospatial data…

Sometimes our data do not align in our maps.
Why is it a challenge to keep our maps "right on" with positioning and attribute accuracy?

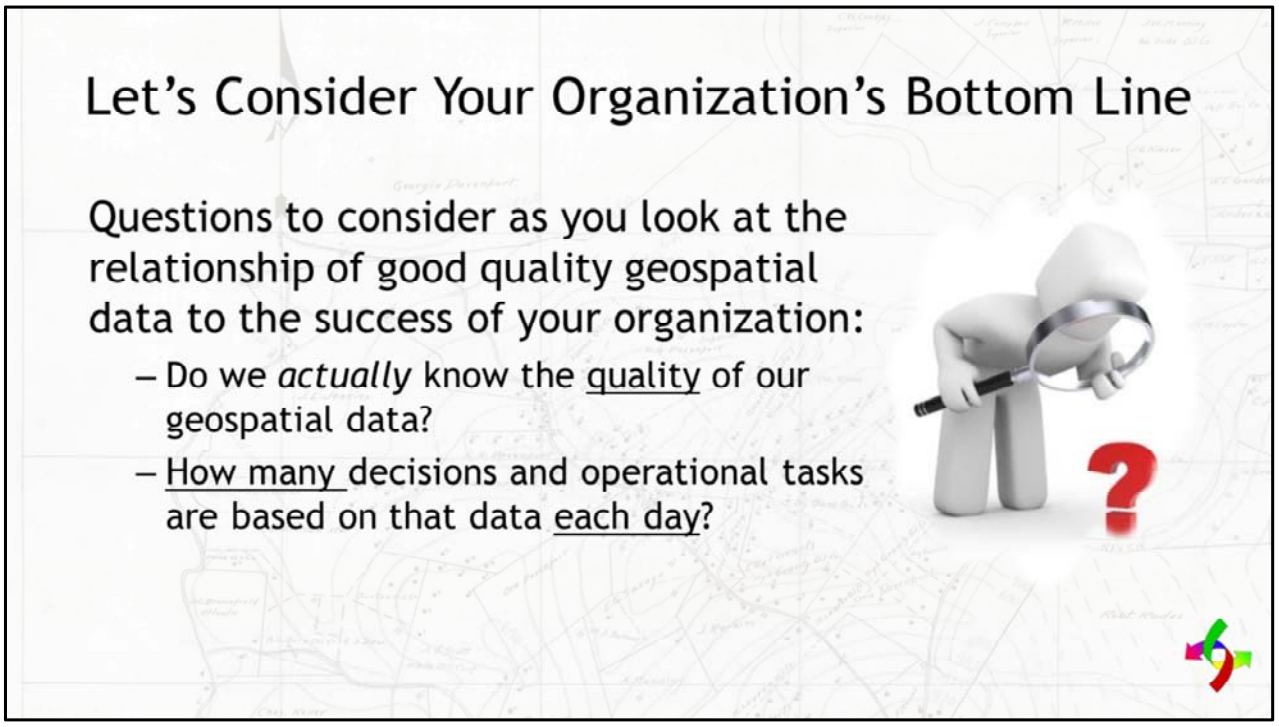
How can data quality "go sideways"?
What happens to that data?

Geospatial data is complex to manage.

Sometimes the source of data is not "us" - Often it depends on data coming from somewhere else – and more so today. We depend on others – sometimes from outside our organizations that we really do not know that well…
We have to chase down which data is right and which is wrong, or are they both right or wrong?

Our consumers expect that the maps are right – every time.
How do the data in maps end up being of questionable quality?

What can we do?
How do we handle this?



Is it really THAT important to focus on geospatial data quality? What if we don't. How do we really know if it helps?

Remember– it is about **how people use YOUR GIS**…

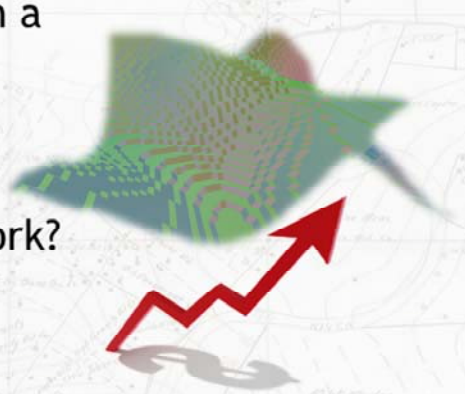
how does that tie to your organization's strategy, goals, and bottom-line?

How many decisions are supported every day in your organization, using GIS? You come to SCAUG to learn more and collaborate, so GIS must be pretty important, right?

Questions? Comments? Let's move on…

What are the effects of data quality on end product?

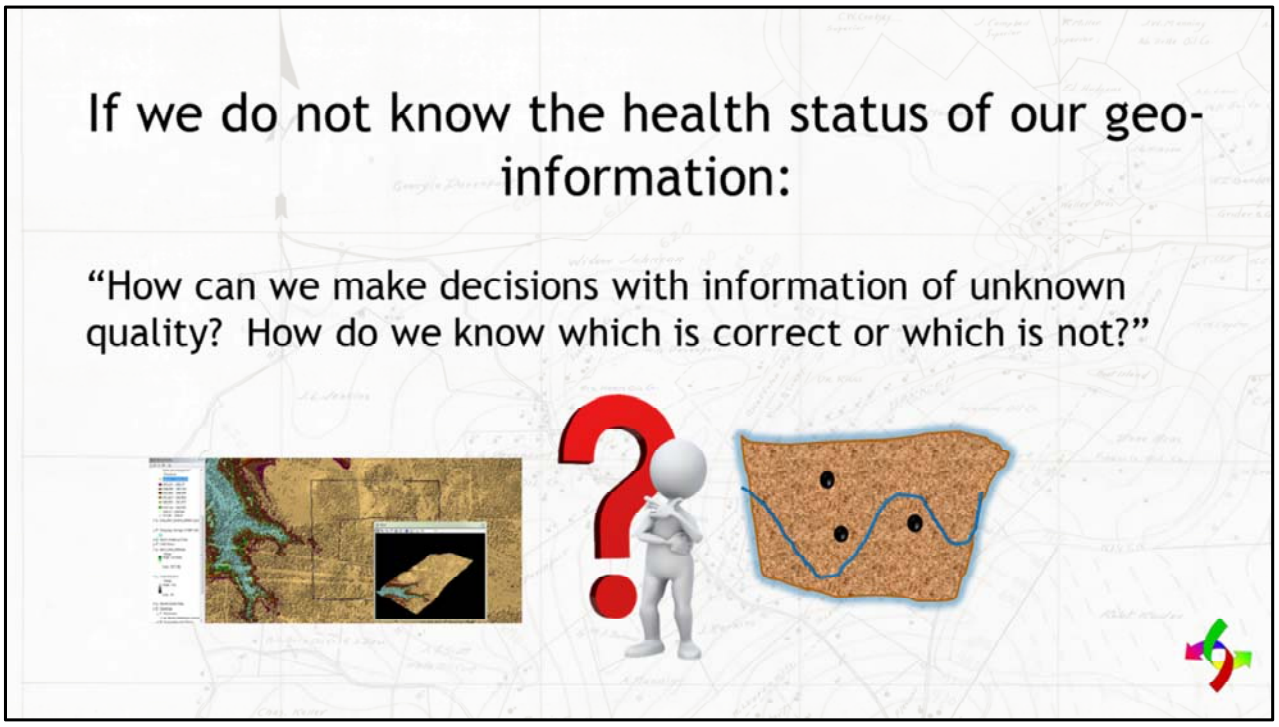
- If we have poor quality or incomplete GIS data, how much could it cost on a per incident basis or overall?
- How many waste, re-do's, and operational inefficiencies?
- What are the costs of inefficient work? - do the math the numbers add up!
- Could our reputation be at stake if something bad happened?



Think about it – what are the effects of data quality, good or bad?

How many of you, today, can raise your hands and say that you absolutely know the "health" of your geospatial data. Do you check?
Do you do this regularly? Monitoring the health of your GIS data by regular check-ups are critical to its "wellness"

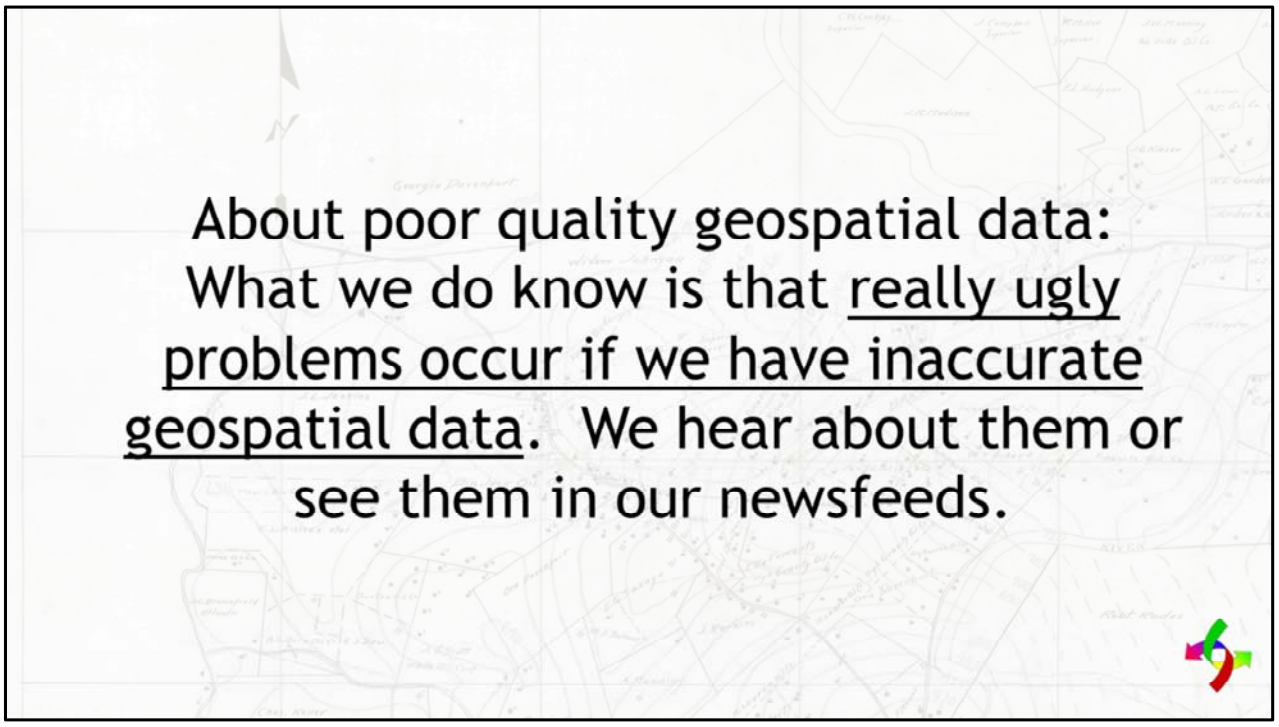
Publishing the health of your data is important to your GIS data consumers!



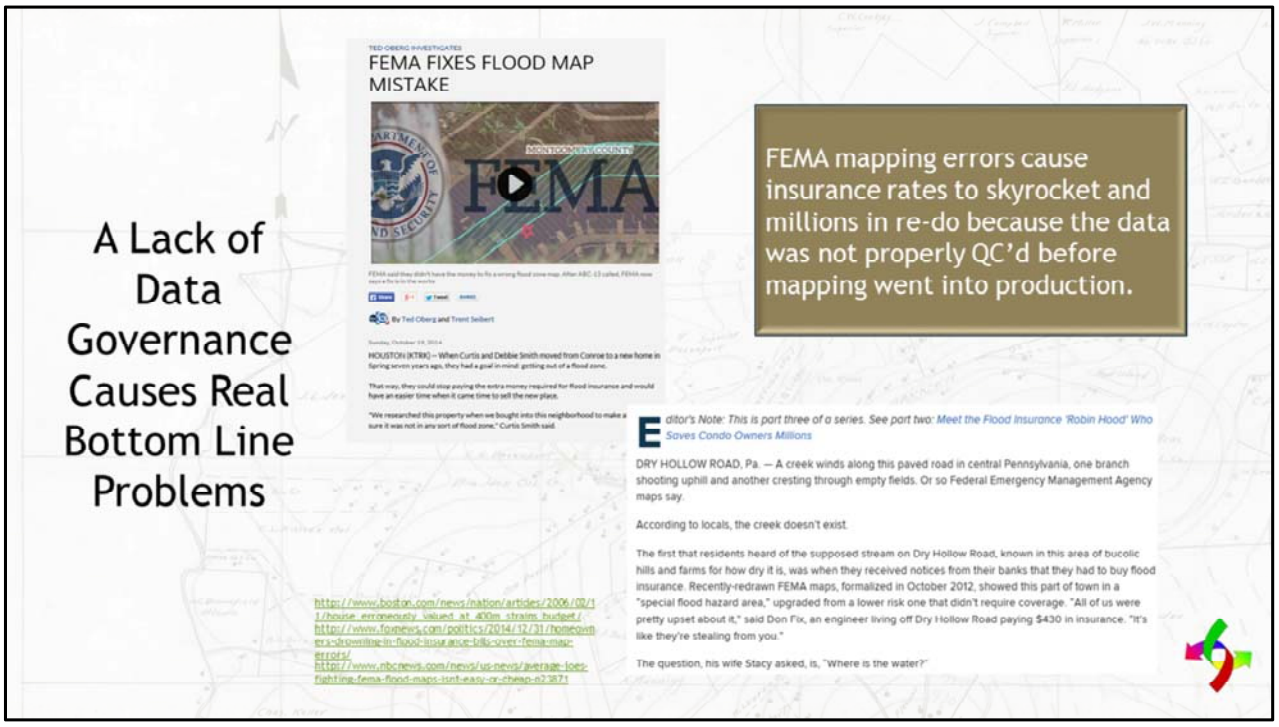
Once someone says that our geospatial data are not trustworthy, all bets are off!

When data are not trusted, people stop using that data, and anything related to it, if they know! How do we know which is right, and which is wrong, once data become "suspect"?

What are our measuring devices for quality and trustworthy geo-information?



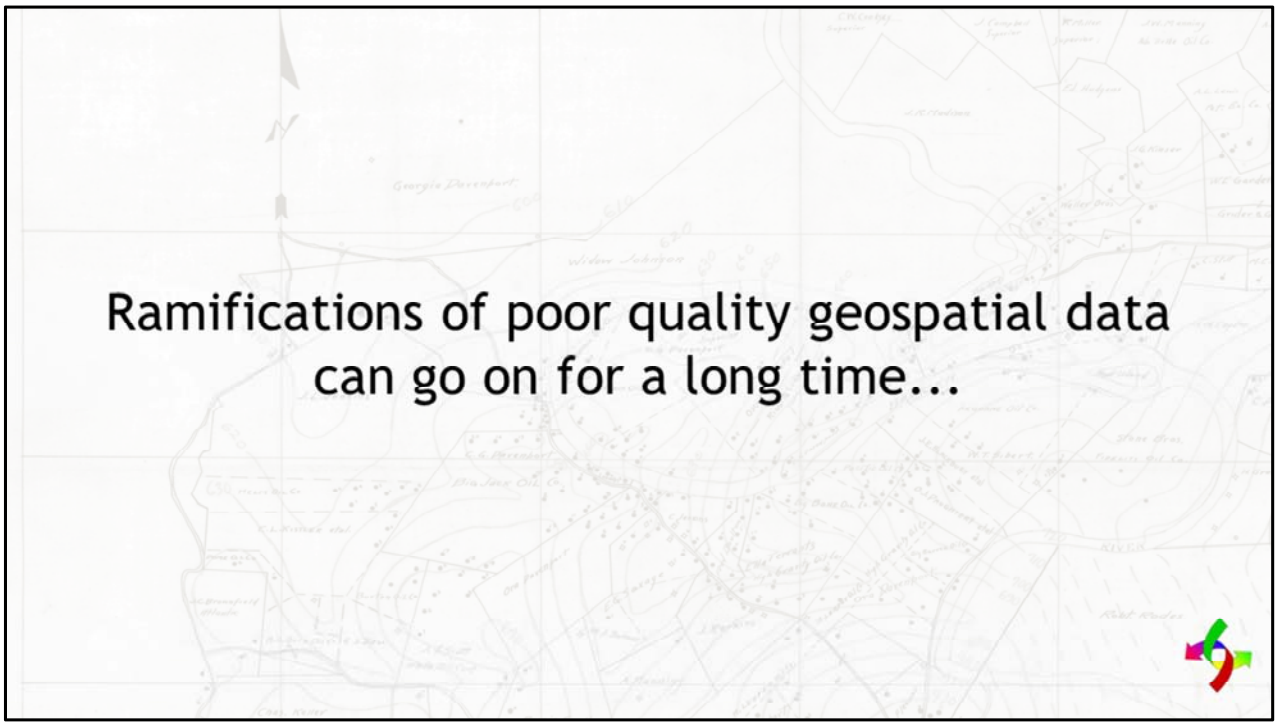
This inevitably makes headlines…



Here are some news items that may or may not have impacted people that you know, or even yourselves…

The FEMA one did have a direct impact on my family. Luckily, someone caught the error, but it caused FEMA to have to completely re-do the notices and billing processes for all of their insured in a number of areas of the US.

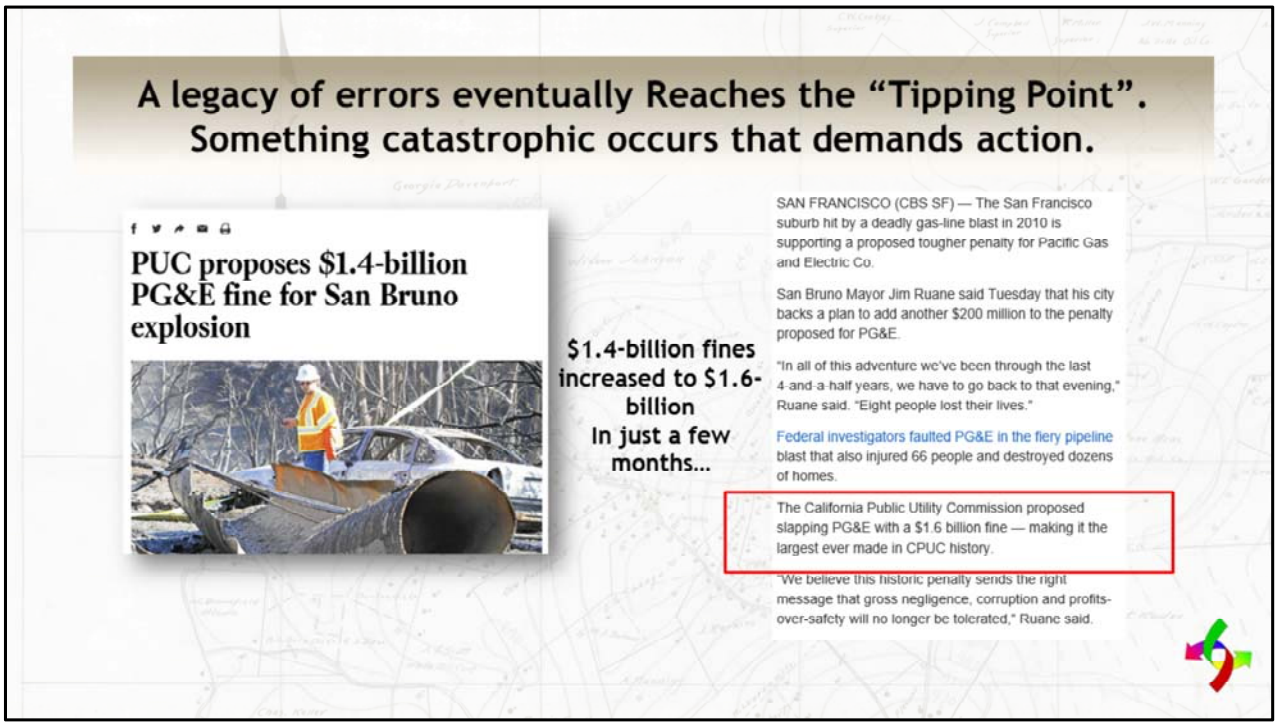
Imagine the cost of having to re-issue invoices, after the cost of recalculating the amounts, and of course it naturally affected some budgets in a number of places, including those of individuals…



This leads us to some case examples…

Let's talk about one that many may have heard about.

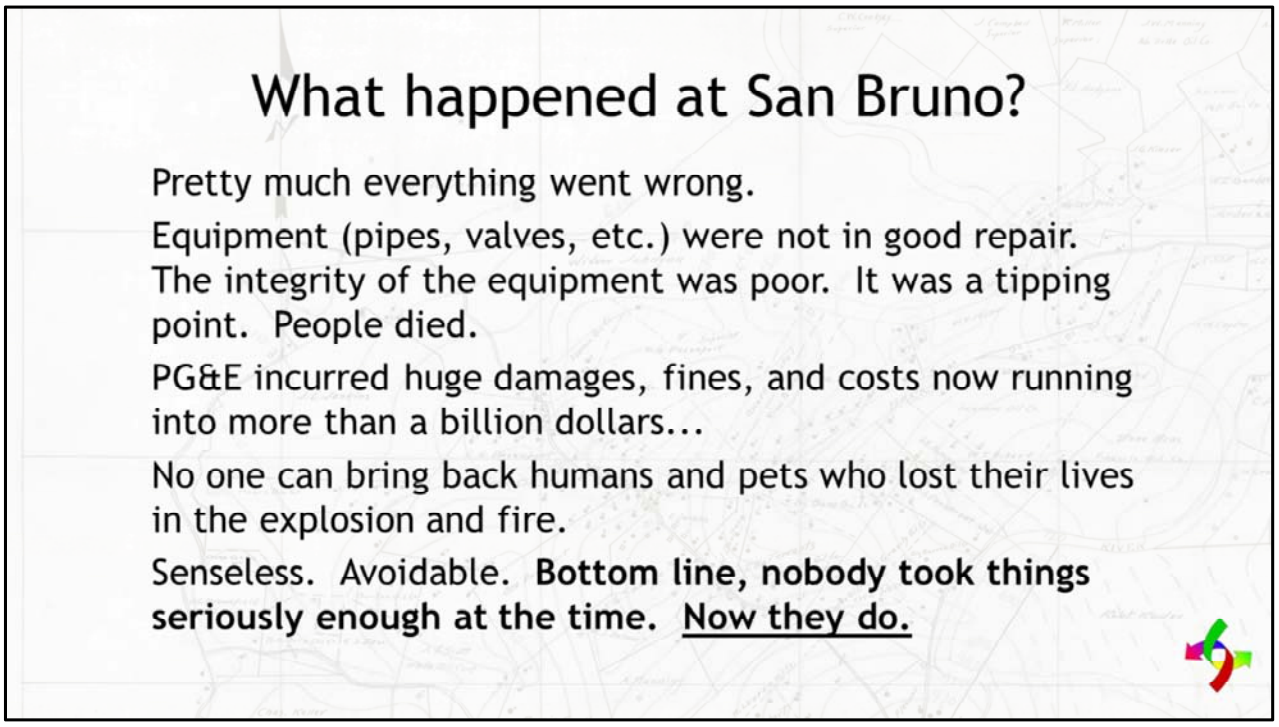
The folks at PG&E have been on the road, telling us in conferences in presentations about what happened and what they had to do about it immediately – and they are still having to manage the fallout…



Other organizations have reached the tipping point. This is not new stuff. PG&E is still not settled…

The penalties for lost and injured lives costs one organization over $1.4 BILLION dollars and counting…

March 31st, more penalties are proposed… this is an additional two million dollars…



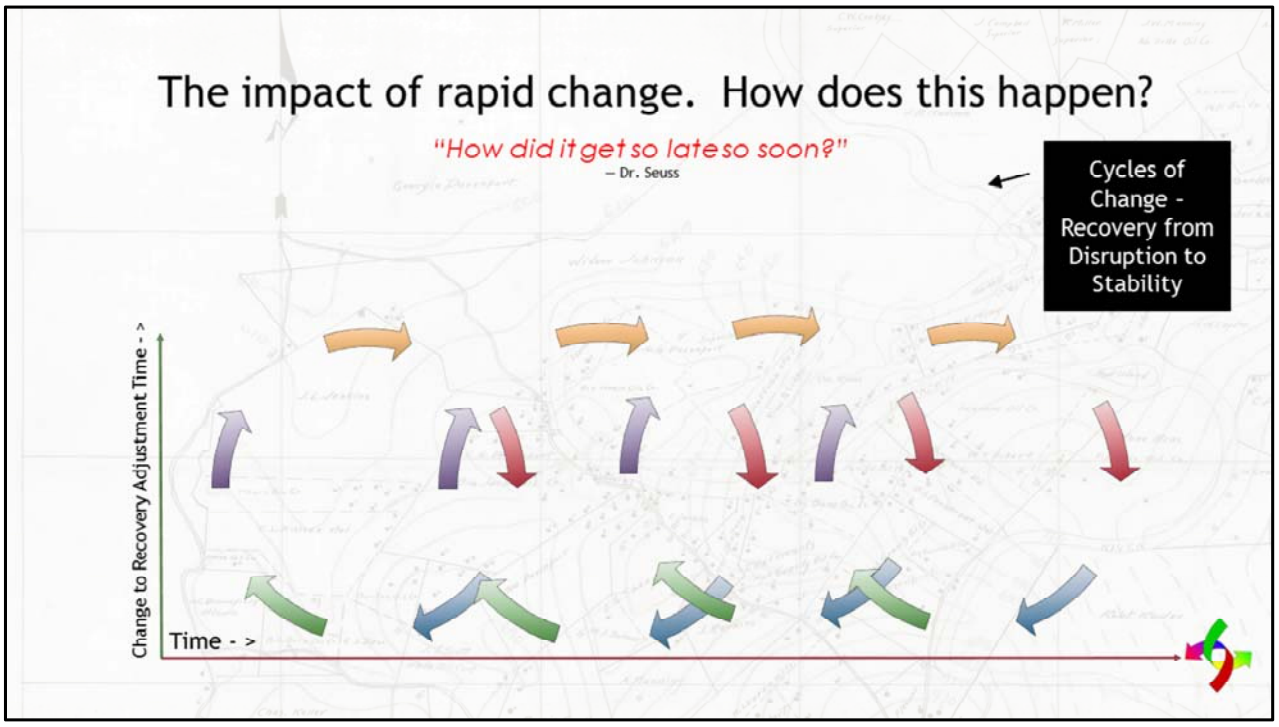
Locations of pipes underground that delivered gas to customers were missing, unknown or incorrect.

Documents about the pipes were not available to people who needed them.
Integrity and repair history was unknown for some of the pipes that carried the gas to customers.
The maximum allowable operating pressure (MAOP) was not being managed well.

Managing our business, we do this every day with the greatest good intentions.

Why does all this happen?

RAPID CHANGE and HUMAN NATURE… not enough strategy to maintain the framework – stuff craters… house of cards…



Doesn't it seem that we have changes DAILY, that impact us? Even hourly?

This is the rapid communication of a changing world… It is stressful. It generates a need to act, sometimes before we have time to think.

Result? Rapid cycles of change do not allow recovery before the next change cycle, in order to enable thorough data quality processing.

We often ask ourselves questions, once confronted with change. It is disruptive. It causes instability within us.

So we ask a lot of questions:
“Who is in charge”
“What did we forget?”
“Where is that?”
“Who is around that still knows about that?”
“Oh. We lost the notes about that.”
“How will we know what to do next, and when?”
“Where is THAT map data?” oh my.

Change management. Often we have to go out and hire “change managers”, “change consultants”, to set the organization straight before the next CHANGE!

What happens to our data when we have so much change?

Like cleaning up granny's attic, sometimes the old stuff is left in the corner, people not knowing what to do with it, not understanding its relevance to today's business context.

- **What people have neglected, just might matter to critical business…**

People come, **people** go. Sometimes **people** just assume that all is good without checking what is in place, or if there is a plan for data.

Sometimes the **people** that make the decisions do not have enough information to know if these are the "right" decisions or not. Too little time is given to analyze the unknown.

Some of the data issues and causes of accidents are rooted in change resistance, in business culture, and our work habits.

Safety and **what is safe**, seems like it should be straightforward, but actually, it is very complicated. Change drives uncertainty which ups the risk.

Successive, rapid, transitions from old ways of doing things to new ways of doing things.

Safety culture can become unstable and questionable in changing organizations.

Individual accountability is not always balanced within the safety culture.

The work processes change. Some parts of the old were left out of the new.

Erroneous assumptions can be made due to many contractors onsite, and supervisors not double-checking procedures and understanding geospatial data quality in maps and data relied upon by multiple teams.

The location aspect of safety takes complexity to a new dimension…

- It makes safety that much more complicated!
- How can you know conditions of unknown **real objects** underground if you do not even know that they are there?
- **You don't know what you don't know.**

Locations of "things" are ever more important to managing risk…

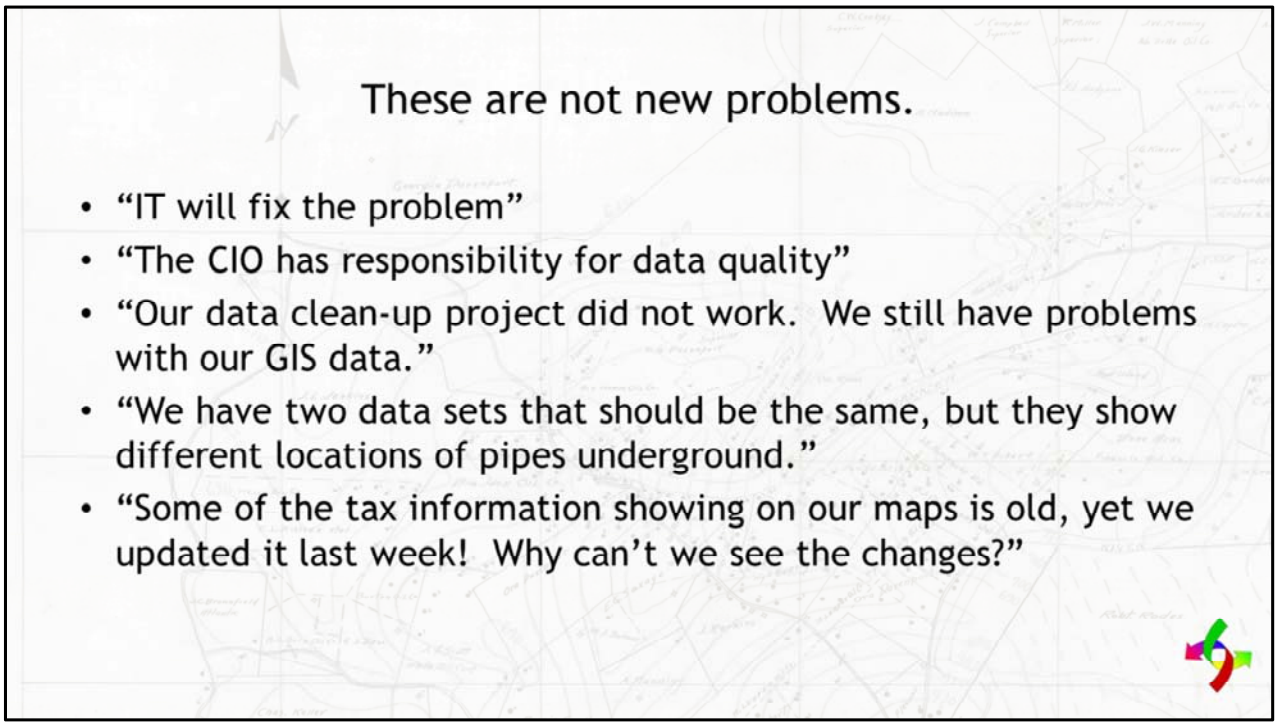
Geospatial data can **enable**, not disable, safety, **if structured to do so.**

People, Policies, Procedures, Processes, and Geospatial Data Integrity…

- We hear about the classic "People-Processes-Technology" as a mantra on how to manage our business better. Keep this in mind.
- Look at your neighbors sitting next to you in this room…
- Look to the left and to the right.
- Every one of you has a geospatial data issue. Guaranteed.
- Think about your role in your organization.
- Pick a "data issue" from your "experience bucket" and think about that one as we move on through this discussion today…

Your Assignment

An exercise for you - A THINK POINT. Let's think about the People Process Technology trifecta. Anybody heard of this before? What are the critical parts of it? Look to your left and right – every one of you has some sort of geospatial data issue or maybe more than one. Think of your role in your organization. Think of one of those issues and as we go through this discussion today, think of how it relates to your issue.



Think about our geospatial data problems. Now, note these reactions on the screen are some that we have actually heard from people who have issues with keeping their data under control…

When geospatial data issues occur, and the discussion begins on what to do, what are some responses that we have heard from managers and executive leadership and their staff? Here are some real examples. Maybe you can recognize some of these? Are there more that you have heard? Playing the blame-game or deflecting are common.

Fat-fingering data, editing data, poor loading… How does the CIO retain responsibility? Can IT really fix everything? Once you clean up, how does it stay clean? Data set contamination or corruption? Losing track of metadata and important context. Erroneous assumptions that become rules…

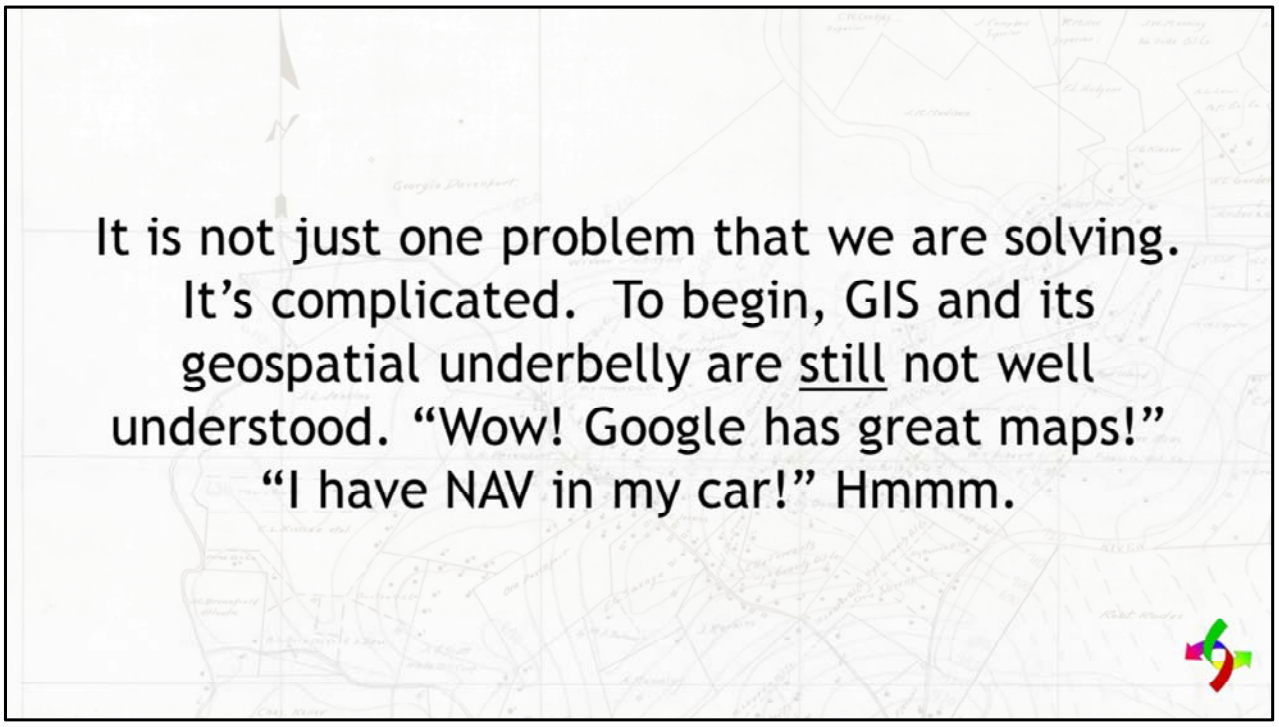
People can be a big part of the problem. Integration and synchronization issues are real. Rules that guide them often are missing or have become bogged down without adequate oversight. People move from role to role or out of the organization. These all, plus more factors have real impact on geospatial data integrity.

Organizations have been addressing these issues since the early days of using GIS to "do real work" We have Esri and their ever evolving technology. We have improved workflows using GIS. We have thought up processes to help make for more consistency. Then there is that data! **sigh** Will technology save us?

If we have great technology, why the focus on the people part?

- Technology is great. We have interesting tools, database models for geospatial, and applications out the wazoo! Why do we still have problems?
- Why don't our solutions just make it right? Why does it not stay fixed?
- It's those people again, making messes!

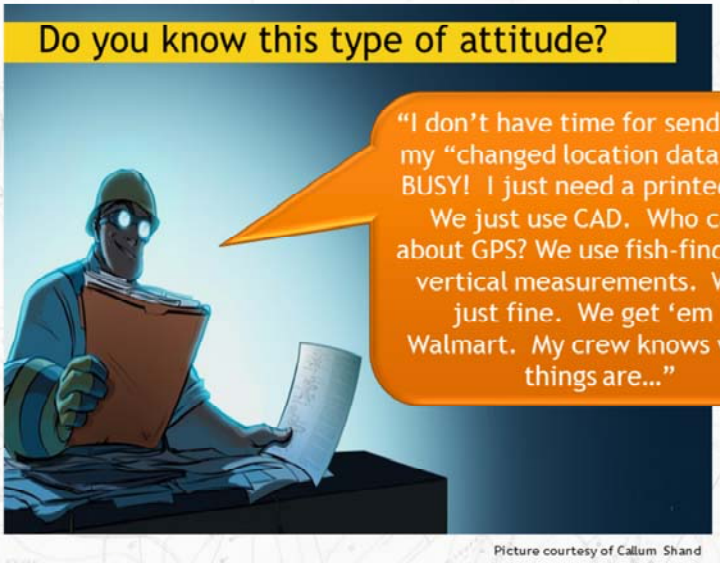
Why are People so important? Let's explore this.



We still have issues with that age-old question, "what is GIS?" What do we say? It's complicated! Maybe we understand it, but does your mom understand it? How about your grandmother? Your friends who work in a non-GIS related setting? Your kids?

How many of you have been in these types of discussions and found yourselves having to "justify" GIS? Your consumers of GIS might scream bloody-murder if someone said some of these things to them… How would you respond? These are real!

Perception Challenges - the “Paleo Technic” Engineer

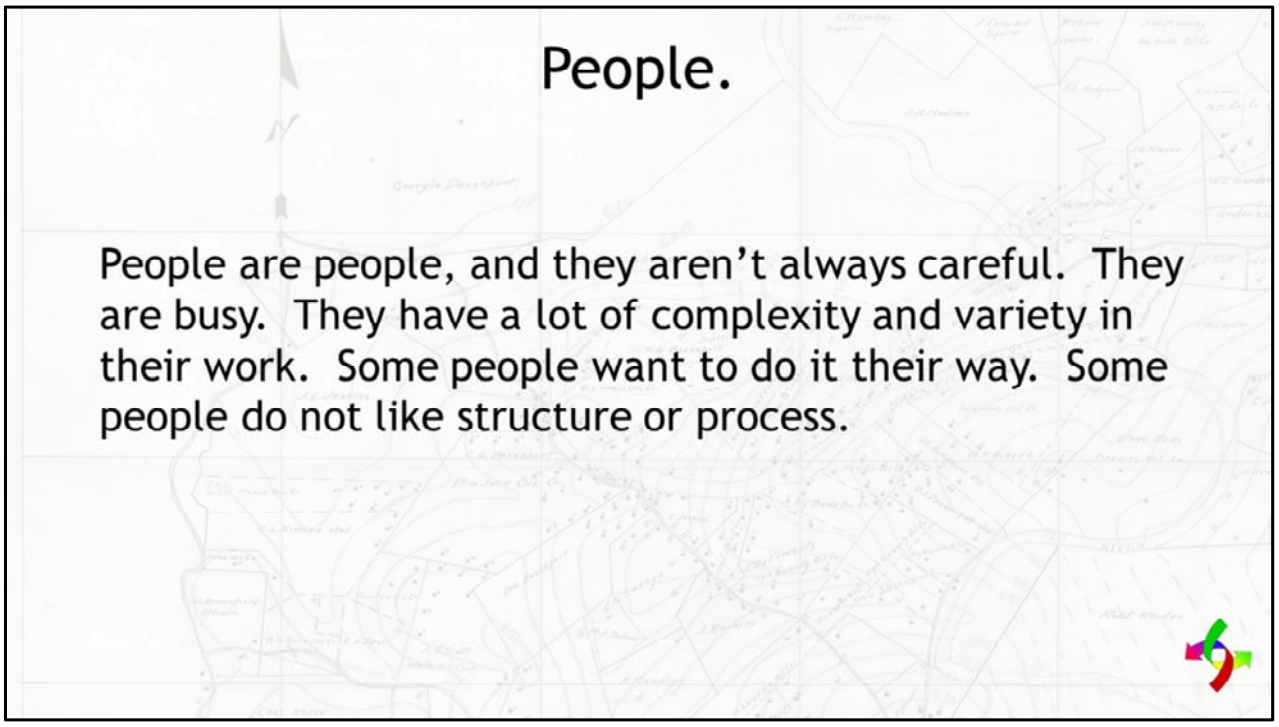


Here is an example of one “stereotype” that we encounter. We call him the “Paleo-Technic” Engineer. A Scottish friend of mine in GIS came up with this awhile back, and it is still true to this day… How many of you come into contact with these perceptions and chatter about GIS?

Habits of Obedient, but Uninitiated Worker Bees…

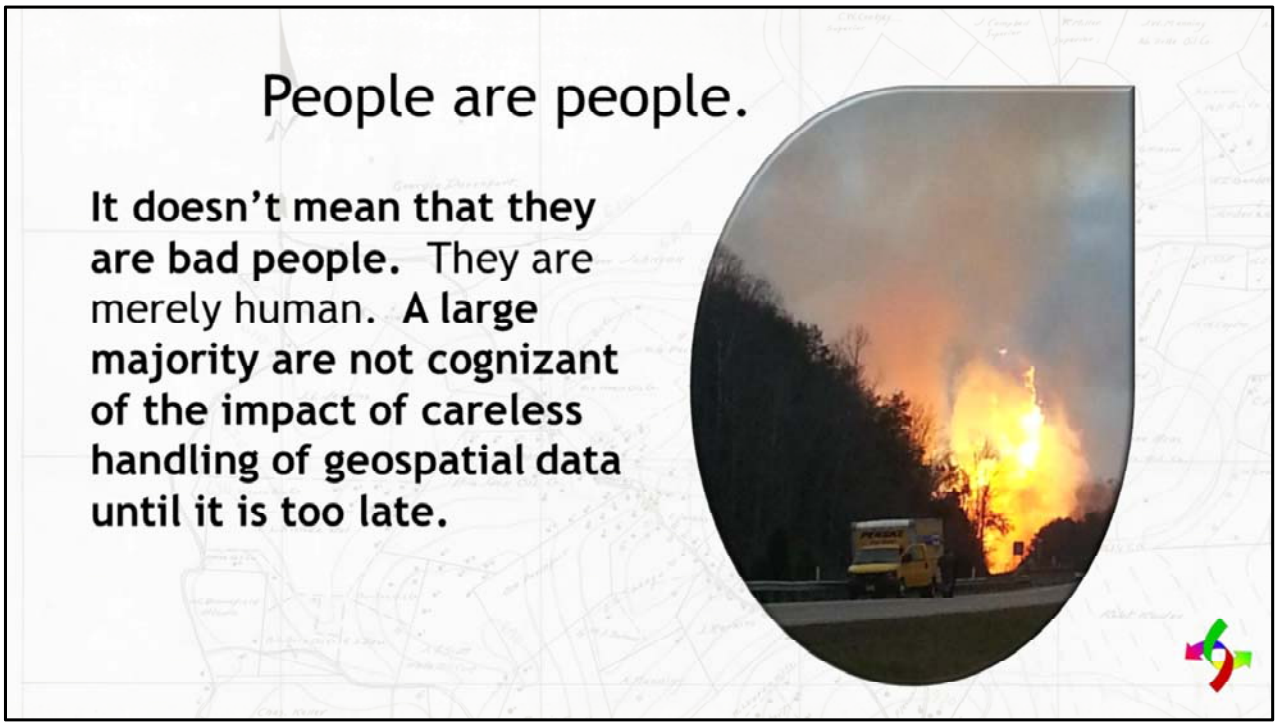
- Makes maps for years but doesn't know why.
- Moves map features with disregard to underlying data.
- "Patches" over "erroneous" map features with "graphics" of points, lines, and polygons.
- To make the map features fit on the page, moves features into the frame using the editor.
- Loads data with no QC or parameter checking, including a CRS check.

Let's talk about how your user communities still have members that are half-baked on GIS use and spatial data management. We still encounter these issues that cause data issues and data perception issues.

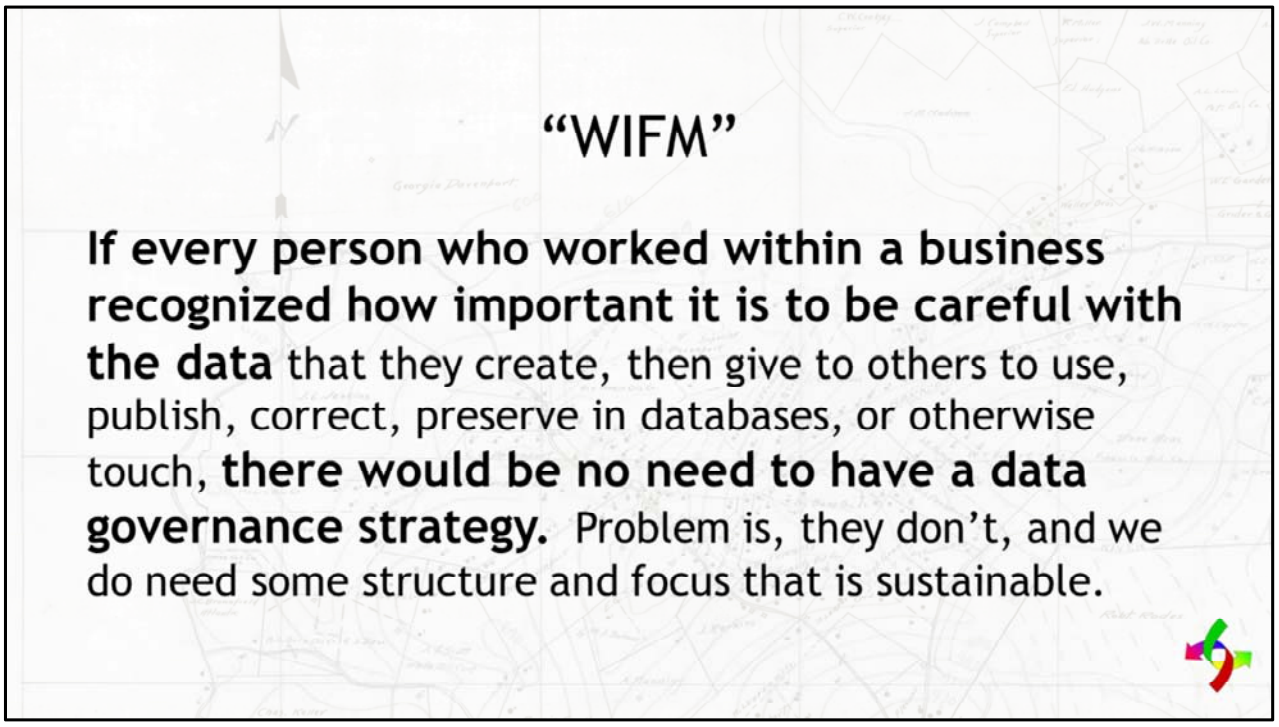


However! Let's be real. People mostly do not like to change. It's a hassle.
Sometimes people are afraid of losing their jobs.
Sometimes people are worried that others will think that they are stupid.
They want to do things how they have always done them.
Complacency makes it worse.
BUT People can be a big chunk of the solution as well as the problems.

It boils down to control, energy to do things, response to change, communication, fear factor, and these really are not specific to geospatial or GIS, are they?
We still have to manage around these or despite these realities.



This requires communication and awareness to be ramped up. Really bad problems can happen if we have people not tending to governance of geospatial data that others depend upon for work. That is most of the geospatial data in our organizations, right? Why else have a GIS if you don't use it for real work?

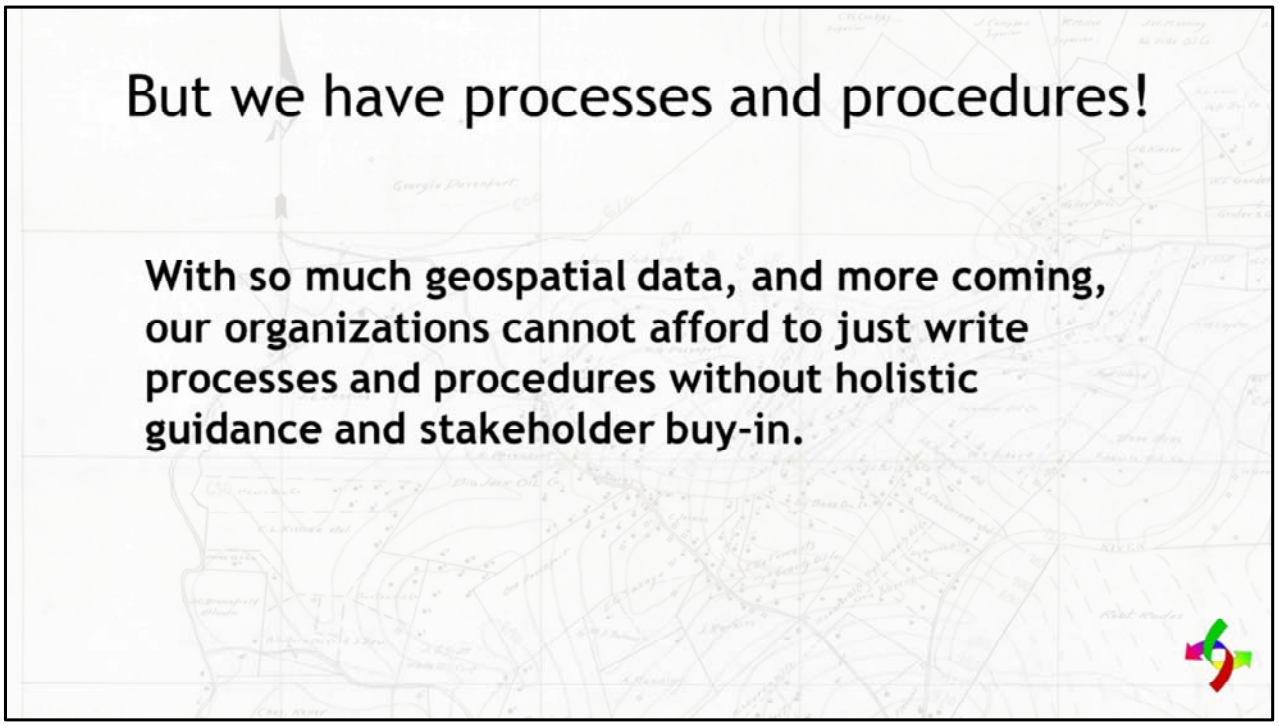


REALITY:

Only a few people truly care. Many are selfish.

They do not like to change. They think in "WIFM" terms…

Another issue is our "what's in it for me" that pervades our culture today. WIFM. How do you make the "care and accountability" stick?



In some organizations, there has never been a holistic program put into place to govern and standardize the handling of geospatial information.

Order-taker culture has prevailed from the days of “make me a map” rather than “look at requirements and provide a solution”. Sometimes the order taker does not realize what is behind the order. This leads to data quality issues for decision makers…

But are they holistically planned and managed?
Great if they are!
BUT, sometimes the fiddler wants to play a solo without the knowledge of the orchestra leader…
A good look at standards and criteria for quality has not happened in many organizations.

No one is doing this intentionally. It is just the way it has always been and works okay – it is just not optimal.

Business culture and expectations impact data quality.

What is most important to your organization's efforts?

1. Quality work
2. Safety culture
3. Getting projects done quickly
4. Getting money in the door
5. Team spirit and collaborative environment
6. Whatever the boss says to do, do it
7. Getting those end of year bonuses
8. What else?

Think about your organization and what is important to achieving its strategy. The business culture will make or break the quest.

Think about your geospatial data.

What are the expectations of it to support the goals of your business?

The Impact of Organizational Dynamics on Geospatial Data Integrity

Some organizational structures make for difficult geospatial information governance. “Ownership” and “decision rights” over geospatial data is not clear and causes infighting among teams.
Contractors, assistants, technicians, and analysts may have day-to-day accountability, but zero authority or capability of making decisions about fixing data quality issues.
Organization structures are not set up for “data quality oriented” relationships. Sometimes they are contra-quality.

Example: Organization of people yields disconnected work priorities. GPS data quality suffers.

- In one organization, GPS data was gathered by contractors who all reported to a field supervisor. This data gathering activity was a multi-occurrence ongoing function.
- The contract specified the data quality criteria for field-gathered GPS data, and further that the invoices would not be paid until the quality was checked.
- There was a backlog in the geospatial data integrity group. Often the new GPS data were not QC'd for months.
- There was a 30-day pay clause on the invoices, whereby a 15% upcharge would be added to the 30-60 day payments, and 20% after 60 days.
- The field supervisor signed off on the invoices to avoid additional costs.
- The field supervisor was promoted after 18 months into a new job in another department.
- The data was eventually found to have quality issues.
- Nothing could be done about it.
- Everything was set up for best outcome. What happened?

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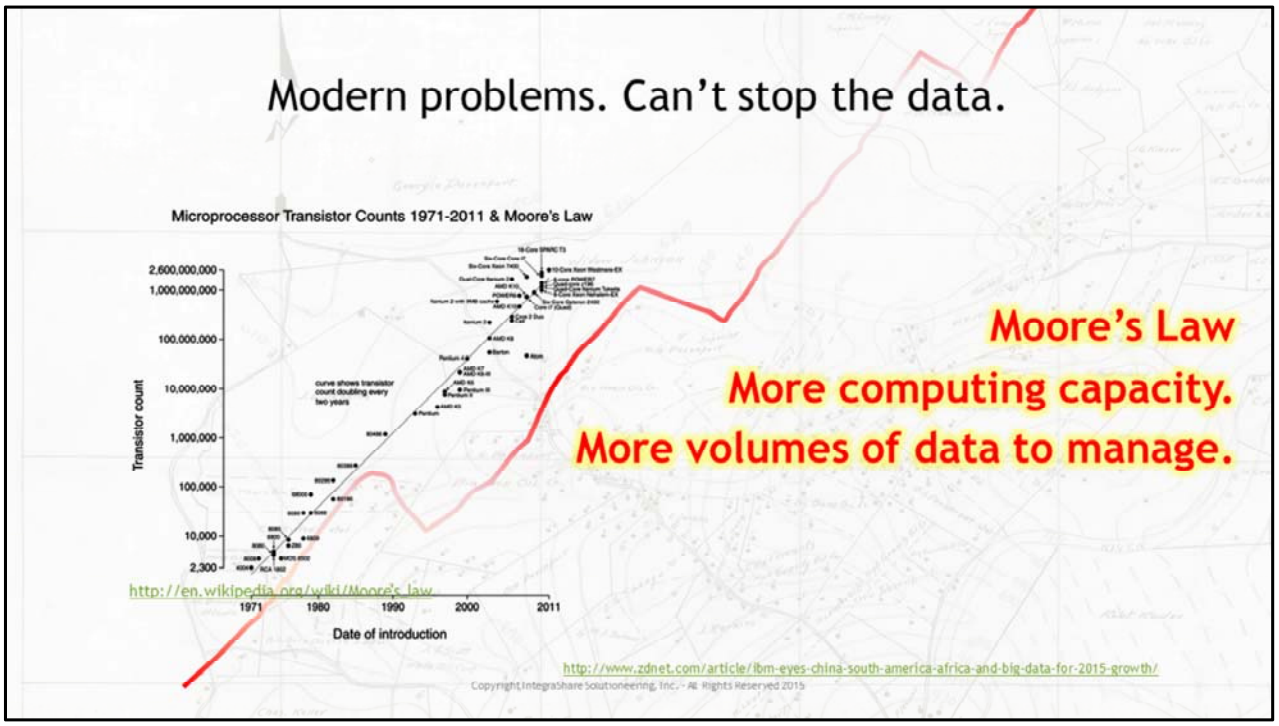
Let's Face Facts - GIS **is** Data Driven

- To square our understanding – there is a lot of data behind every map layer – some have complex relationships that can be made useless if data are not right.
- Simply stated, the "picture worth a thousand words" can be turned to the negative and depict false information without the consumer being aware.
- For some unknown reason, because it is a map, the general consumer assumes it is correct.
- This defies logic, but is more true than not.

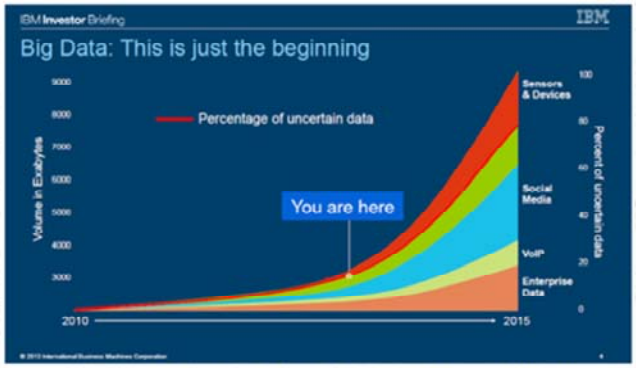


What we know about data and predictions of growth is historically based on Moore's Law. The observation made in 1965 by Gordon **Moore**, co-founder of Intel, that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented. **Moore** predicted that this trend would continue for the foreseeable future. "*Moore's law*" is the observation that, over the history of computing hardware, the number of transistors in a dense integrated circuit has doubled approximately every two years.

Modern problems. Can't stop the data. The "V" factors

Volume, Velocity, Voracious appetites for more data -

Our ever increasing appetite combined with data creation capabilities bring on more data to govern, manage, and master.



IBM, in their investor briefing in 2013 told of their forecast that the percentage of "uncertain data" would grow, and that growth was hugely in the area of sensors and devices, stacked on top of the exponential volume growth of social media – which is actually "human sensor data" of many types, but LOCATION IS A FACTOR OF EACH OF THOSE DATA TYPES. Takeaways from this for our own tiny purposes are that for sure, there will not be any LESS geospatial data to manage in the future.

How does geospatial get it's start in life?

Looking at the data creation sources…

The importance of source and pedigree: Think of this another way…

If you are going to a nice restaurant for a really good steak…

Do you care about the source of your meat?
Of course!

How do you know where its from, and what it is?

Of course, you look on the menu to tell you the "meta-data" about your steak, right?

If you do not, you leave yourself open to eating something unexpected!

Why is source important?

Example:

If you did not know whether a high-pressure gas pipeline was under your house, should you dig a big deep hole in your garden without knowing this?

If we know the source, we can decide if the data are trustworthy (or not)
Once we know if data are trustworthy, we can use it in our work with confidence (or at least we know the issues and can reasonable precautions to mitigate the risk)

Using geospatial data doing serious work

- Using geospatial data to do hard and serious work is now a standard part of doing business in many places.
- Do the people using your geospatial data ever question where it originates?

Or do they only care if they have an issue, and then they think it is ALL wrong?
If this happens, why do you imagine that people react this way?

Sources of our geospatial data can be various along our business life cycle. When we make decisions, it really is all about trust.

- We want to trust the data we use to make decisions based on our geospatial analyses.
- Many people who use geospatial data assume it is “right” and “true” because it is on a map. This defies logic.
- When they discover the data are “erroneous”, trust is gone. Trust is there until it is not, and then it may never come back.

Remember the steak! Mind the meta-data!

- Source really is important. Knowing the source is a habit which we find improves the quality and trustworthiness of data that we use to do work.
- We use data, often without thinking about it.
- Is the data qualified? Is it current? Is it legal? Is it best for our use situation?
- Do we know or do we check? What are the rules?

The sources of our geospatial data really depend on our business habits, and the choices that we make along our business life-cycle, based on our business needs.

Understanding the source.

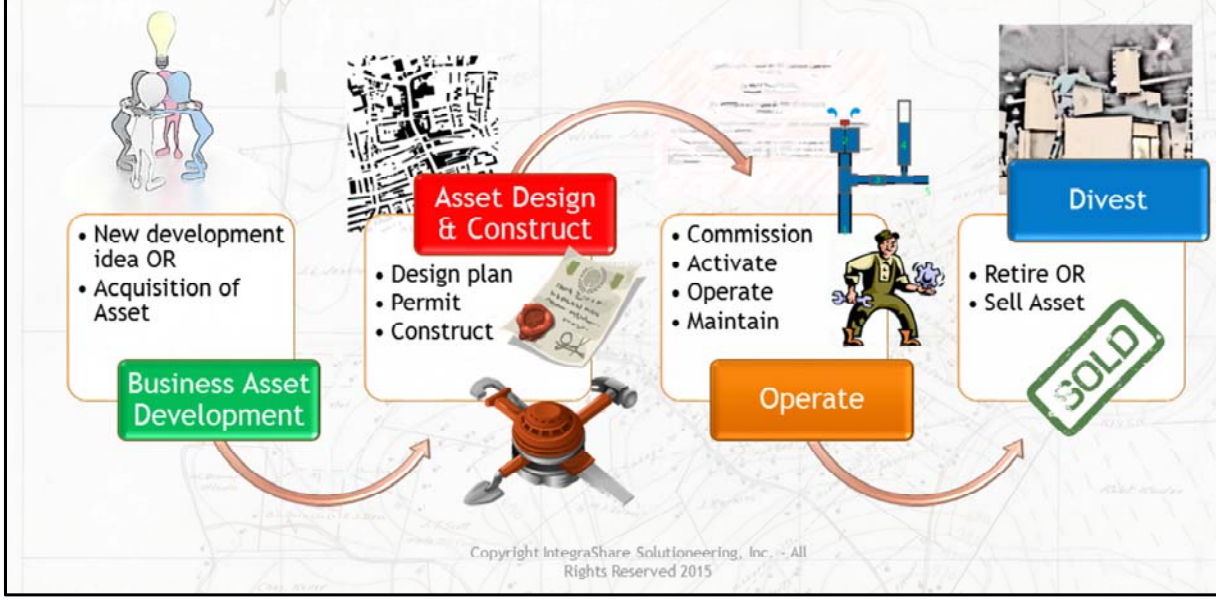
- We may receive some meta-data with our geospatial data deliveries, but sometimes not.
- We may be handed a file of geospatial data, but is the meta-data always there, is the true source indicated?
- One way to understand where data originates and the true source is to tie it to it's entry along the business life cycle which has entry and exit ramps for all types of data.
- Let's explore what we mean by "business life cycle"

The Business Life Cycle

- In any organization, no matter what size, or what the organization does, it has a "business life-cycle".
- Data are generated from day one, then point forward.
- "Data" is born. It's the first day of it's life.
- If you depend on "location" for anything you do in your organization, geospatial data is there to use and manage. Who will make sure this happens?

Any organization, large or small will have a business life cycle. Data are generated from day one. Even spatial data has a birthday. That first little data comes screaming into the world, and guess what, somebody has to take care of it, or it could grow up to be a juvenile delinquent or worse yet, a criminal! Think about your organization's business life cycle.

An example of business life cycle.



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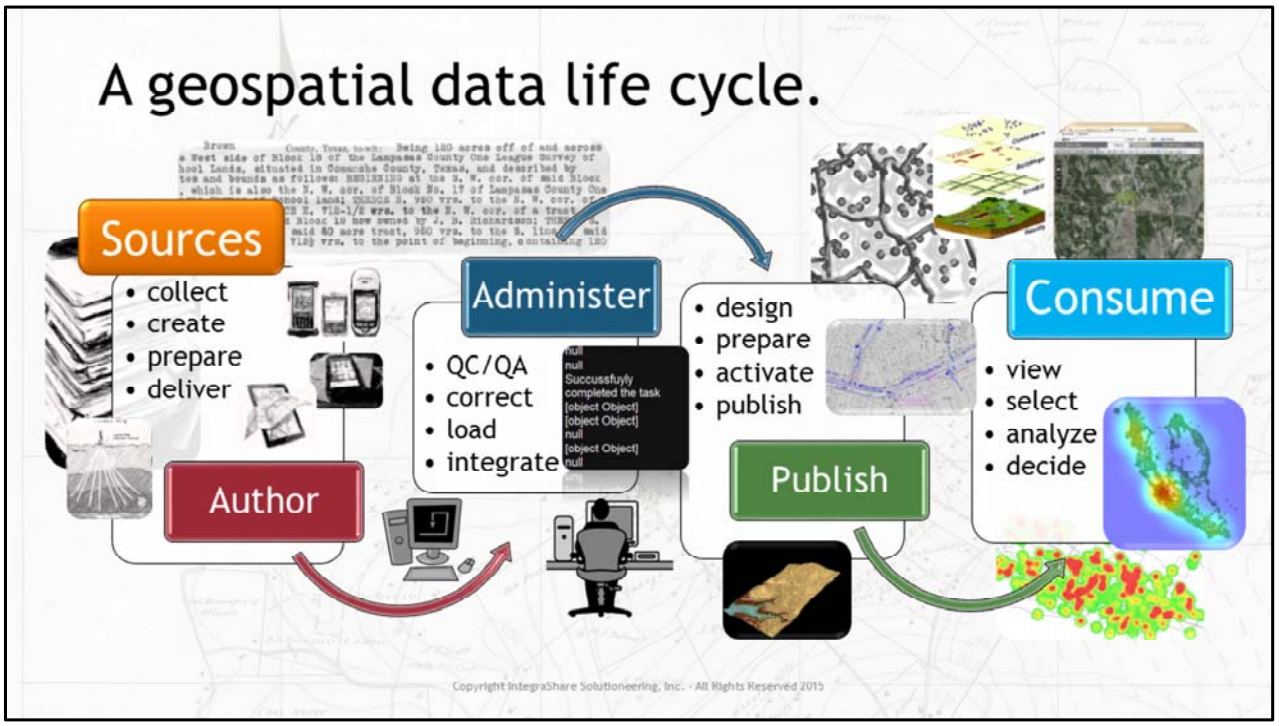
Along the business life cycle people transact with data. Data has a corresponding life cycle. There is a relationship.

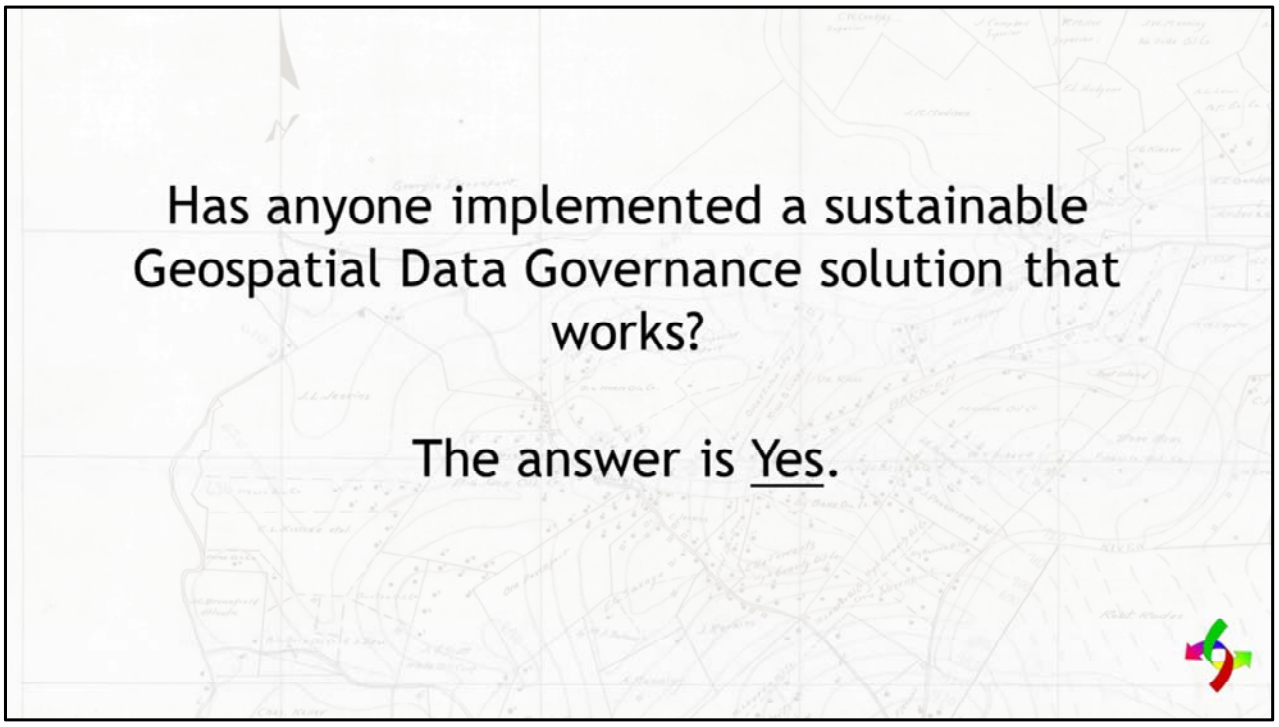


Geospatial data intertwines and relates to business life cycle steps. Sometimes one, sometimes one-to-many

Geospatial data is

> **Authored** or created by one group or organization, is distributed or handed over to another group or organization for their use, then this is repeated. Often changes with changes to what we are doing in our work.
> **Data is refreshed or updated. Someone administers the changes.**
> **People need to know about changes in the data. These must be published regularly by someone** to inform users and the updated versions.
> May be used or **consumed by "anyone", or "just some people".**

This is a description of "data life cycle".



Several organizations have, and more are in the process.

All at various stages of strategic implementation – and all are based on the principles of collaboration, communication, sharing, and sustainability.

Example – City of Indianapolis IMAGIS Program

Issues:

- No independent quality control checking occurred
- Much data was missing or lost
- Systems did not integrate
- Regulatory pressures to fix problems
- City operations affected

Problems in the 1980's yielded a huge confusion related to where the city's assets were, their conditions, taxation, adjacent jurisdictions' information, no integration.

They embarked on a strategic journey to solve their issues…

Case Study – City of Indianapolis IMAGIS Program

Geospatial Data Governance initiated, resulting in:

- Data sharing with partner agencies
- Data quality improved
- Data accuracy addressed
- Data is kept up to date
- IMAGIS positioned as the single source for much data
- GIS data standards, policies, and procedures adopted
- Operational costs reduced

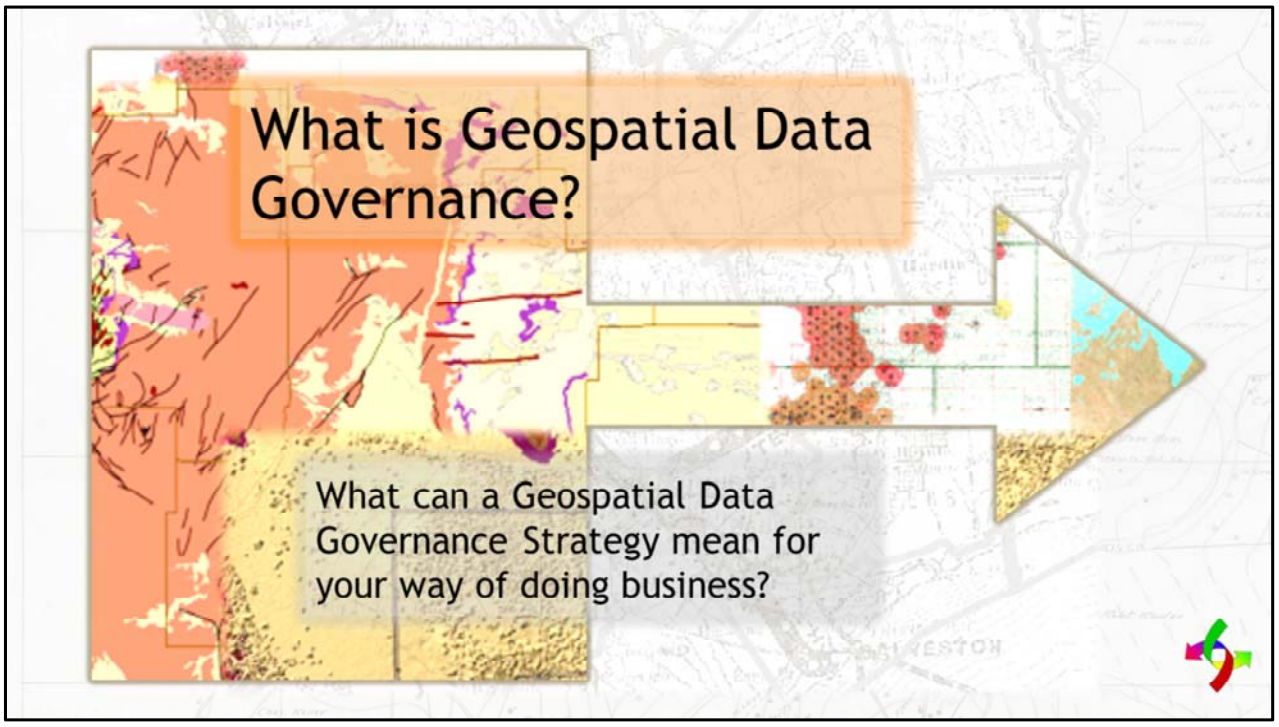
The IMAGIS program continues today, nearly 30 years after it was deployed.

I would call that a success. Wouldn't you?

We all have a GIS, but many are not performing optimally.

A refocus on what is important is required. It takes a having good hard look.

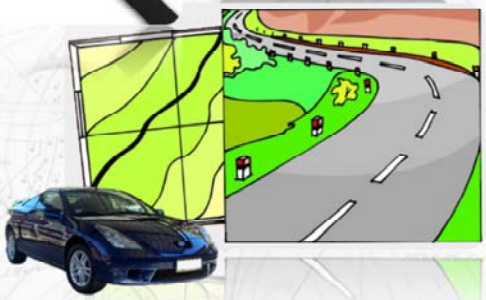
Can a geospatial data governance strategy help you?



What is geospatial “data governance”, and what can having a strategy for this mean for your business? Let’s dig in!

What is involved in establishing Geospatial Data Governance?

- Some questions
- Some listening
- Some analysis
  - Data sources
  - People and Organization
  - Policies, Procedures, Processes
  - Technology
- Some design considerations
- Understand stakeholders
- Management of change considerations
- Some recommendations, a plan and a roadmap… then you go…
- Ongoing, repeatable, and sustainable…
- Maybe you will get 20 years plus with sound journey management!



Geospatial Data Governance.
"How would this help improve our geospatial data issues? Isn't this just data management?"

Geospatial Data Governance is not data management.
Data governance includes data management.

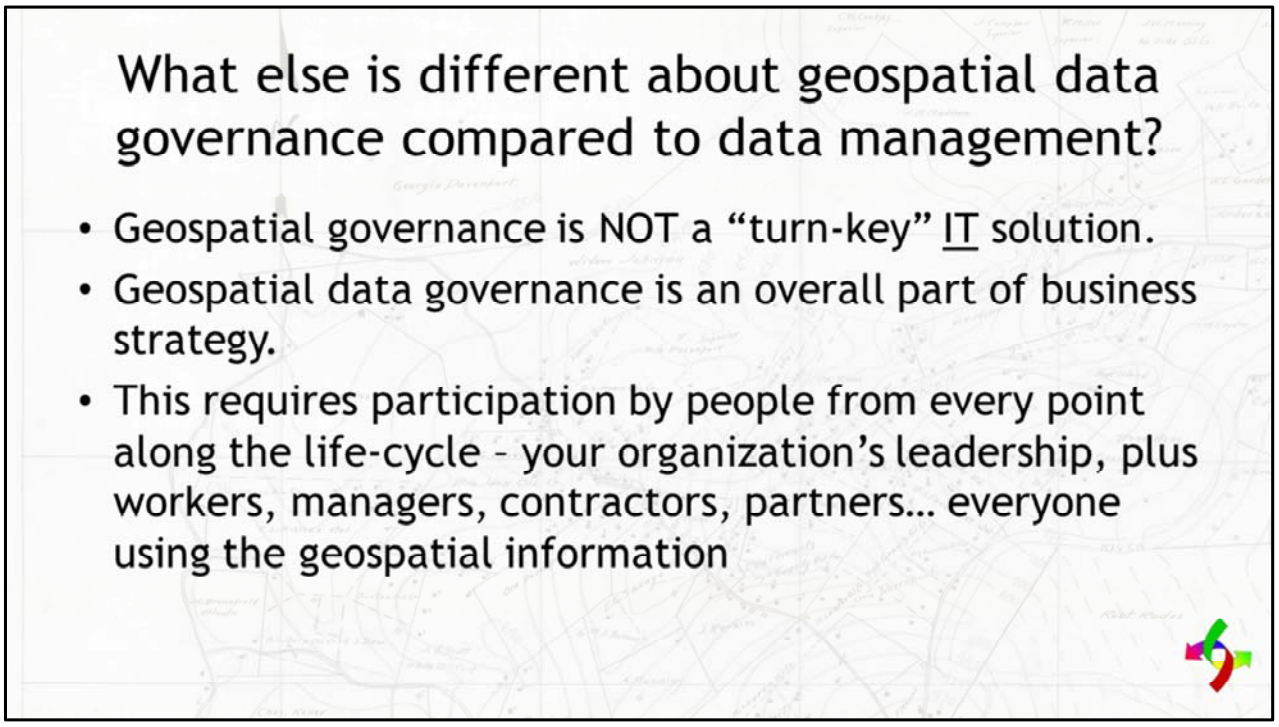
What else is included in governance?

Understanding and coordinating all of the parts.

- Goals, people, cycles, processes, technology, change and your geospatial data

Think of geospatial data governance as a framework or structure that holds it all together. Governance of geospatial data is driven by your business goals and strategy.

Your organization's business goals, your people, the work processes and the technology in place for geospatial data use
Your organization's business life cycle and how the life cycle of your geospatial data and information tracks with it
Who handles the data at any given point along the life cycle, and what happens to the data in its life cycle
Parts that could be adjusted to help improve data quality and fitness for use



As we said before, it's not a "project", not a "turn-key" solution, but an overall part of business strategy.

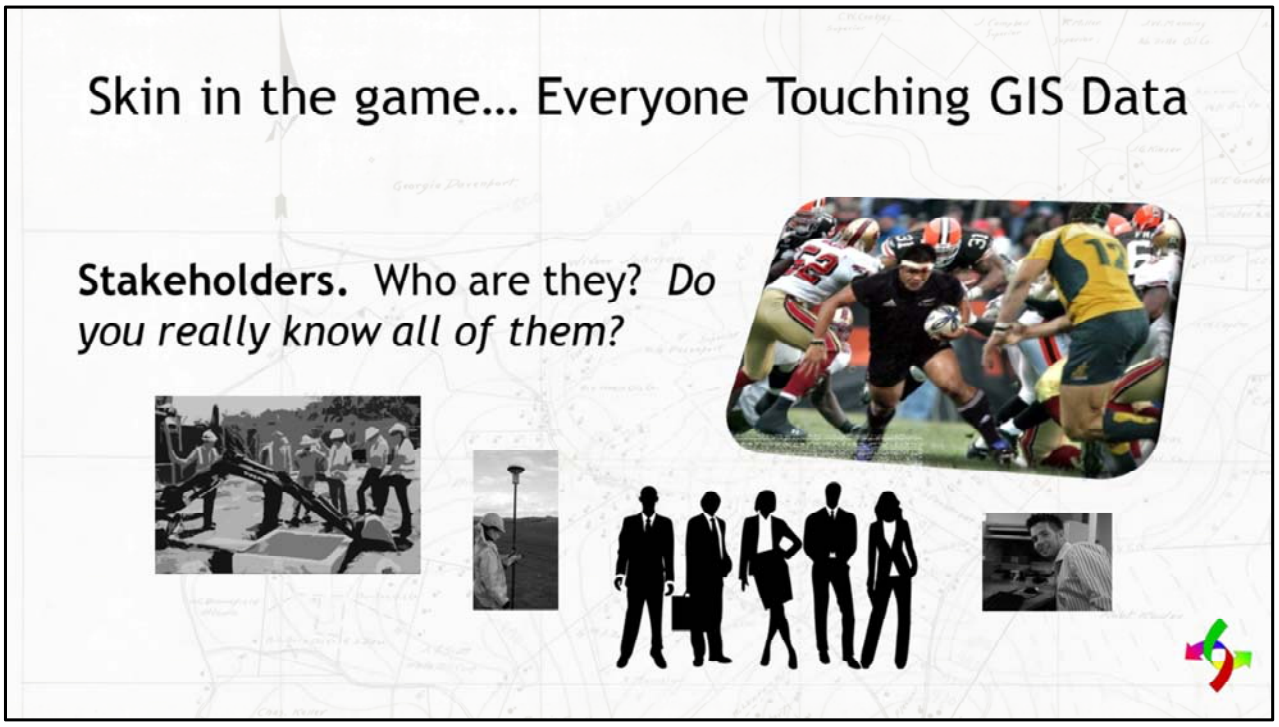
All who are stakeholders in the business who use geospatial data for decision support and work:

middle-management, and professionals that utilize or handle geospatial information along the business life cycle.

Everyone who touches the information has a role.

Collaboration and communication are critical and essential. Recognition of the impact of change and human tendencies on consistency of business is also required.

What are these roles? Let's review.

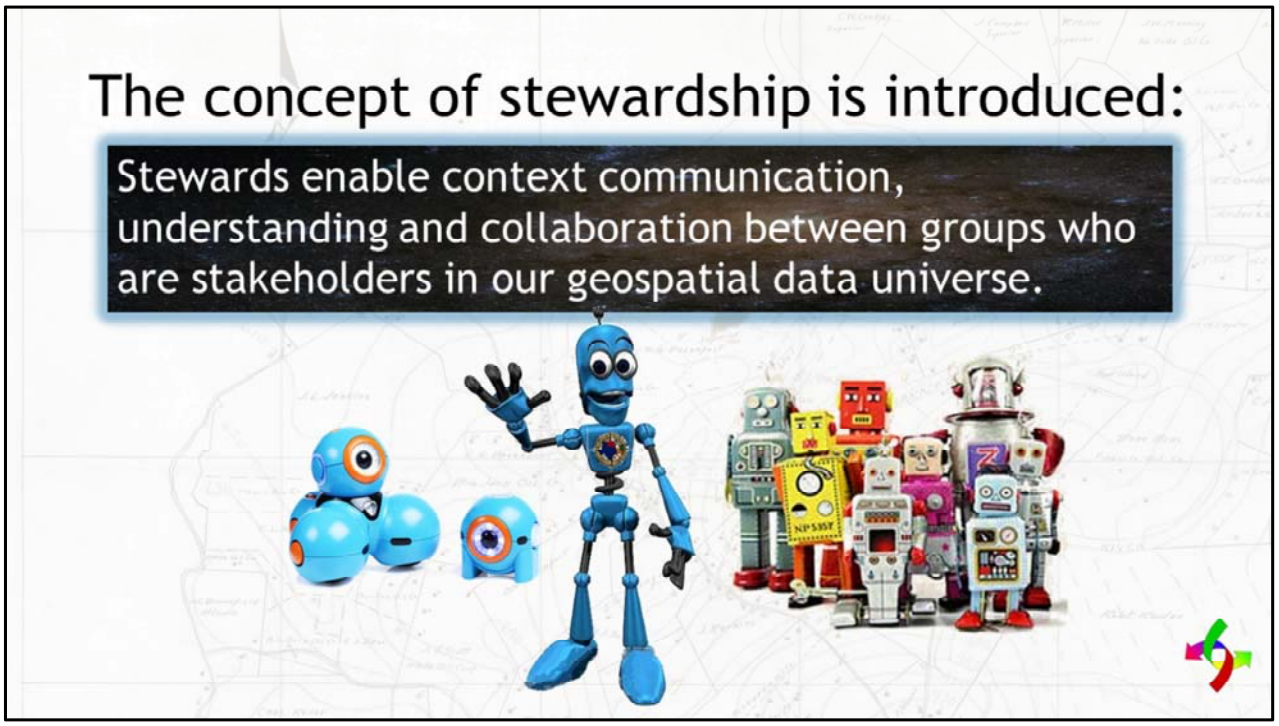


Anyone who "touches" the data and makes decisions based on that data *IS a stakeholder.*

Who are the actors in your organization? Who plays which role? One or many?

- Some common roles are: executive, manager, team lead, analyst, technician, specialist, data manager, data administrator, developer, supervisor…
- Think about your organization – what roles exist that touch geospatial information?
- How do our "actors" interact with our geospatial information?

Everyone has a "role" in working with geospatial information – not unlike working with any information in doing their work.



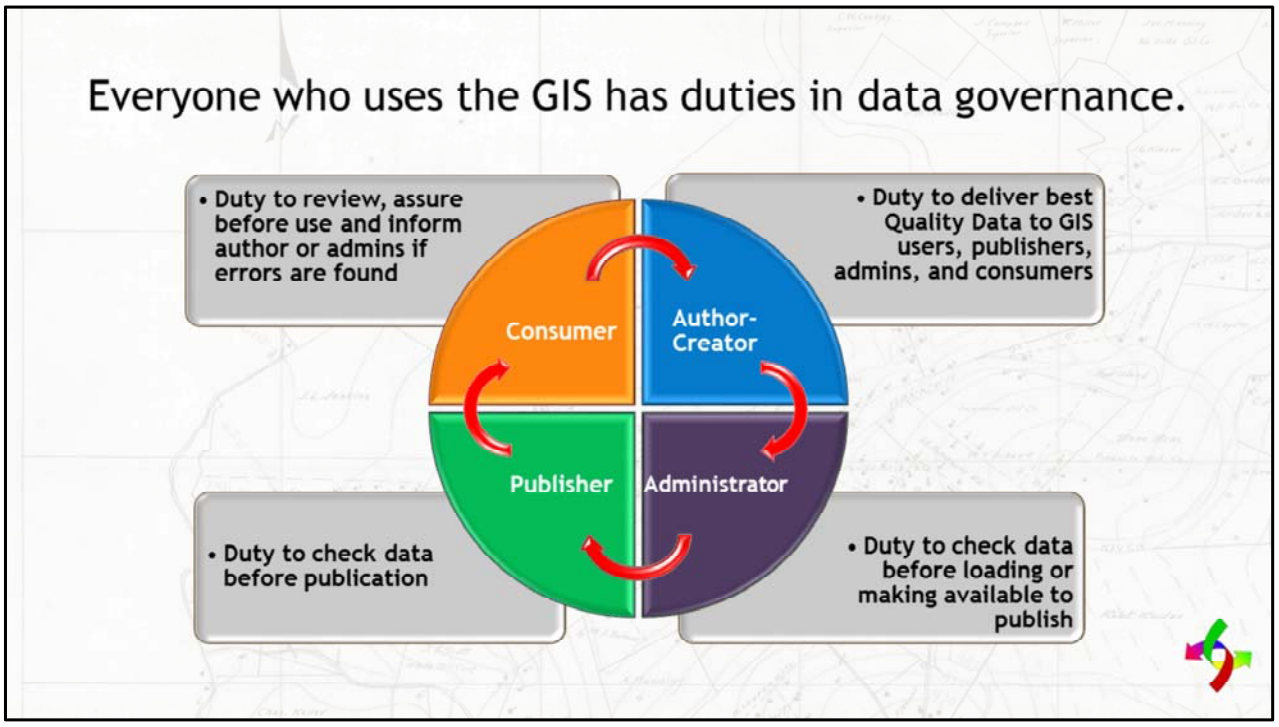
Business context is important in the use of our geospatial data!

We all know how important this is – to enable communication cross-functions, and collaboration with GIS…

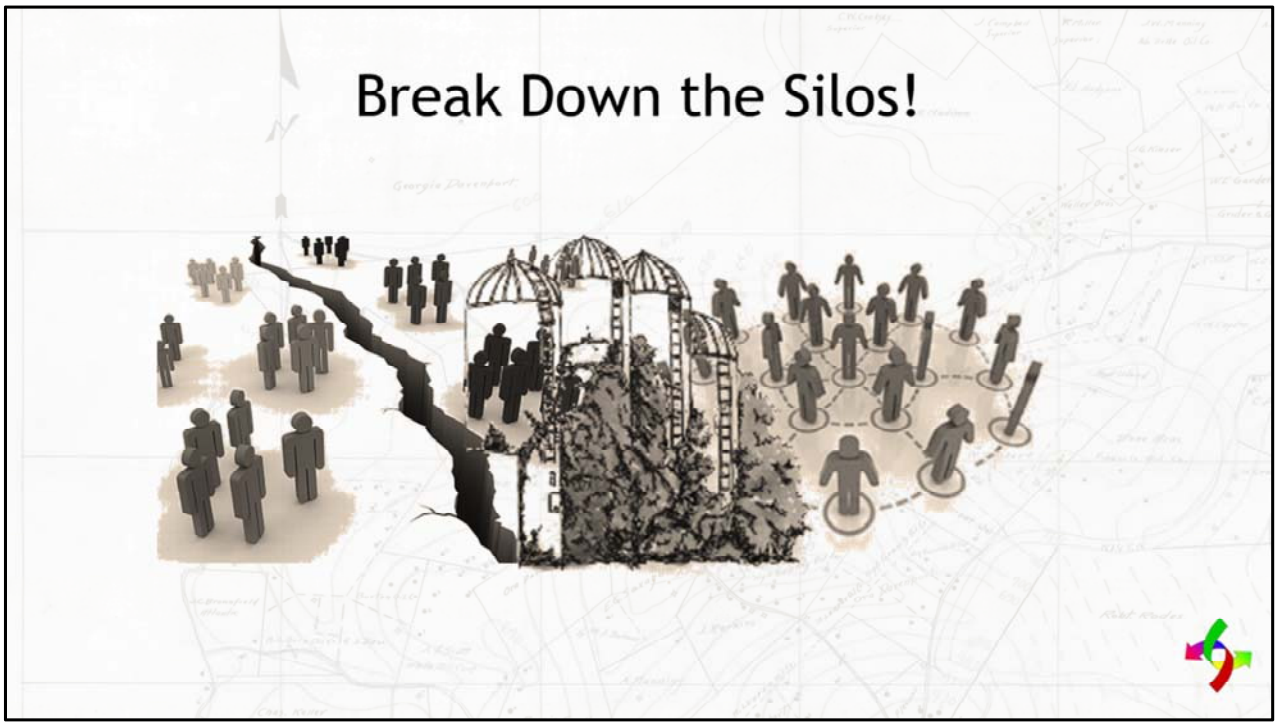
IT often executes the technology and data management processes and needs guidance to make their solutions a good fit
Stewards can enable these solutions and the technology to be more business relevant

Mediators and interpreters are needed to enable communication and management of change

As an official part of their job, Stewards take a full-time, active role in the governance of geospatial data integrity



This also includes: **Awareness** – continual communication between roles



GIS integrates and can help break down the silos or compartments – Jack said so!
Even more our geospatial data can be leveraged to do this!

The Stakeholder Board for Geospatial Data Integrity – Who Would Sit on Yours?

- Think about those invested people we discussed.
- Who would be stakeholders that you could trust to guide your team in building a sustainable geospatial data integrity framework.
- It will not happen overnight.
- Everyone starts somewhere.
- Decide to start.
- It is a journey down a road.

Accountability to the core.

- Roles and responsibilities clearly documented and communicated
- Roles taken seriously – not just "volunteer work"
- Stewards – interpret and mediate between business teams and IT
- Stakeholder boards – oversee and help with priorities
- GIS managers and data integrity teams actualize the policies
- IT teams enable the technology in collaboration with all who are involved
- **No silos, no vacuums, no villains.**

Personal accountability for quality. Why not?

Leverage standards for sustainability.

1. Data quality standards criteria for geospatial data from the source through its life cycle.
2. Standard processes related to data collection, creation, handling and use
3. Standard data models, when they exist
4. Quality Measurements - metrics - for understanding the health of your geospatial data
5. Confidence grading and "stamping"
6. Communication and training, ongoing
7. Management of change
8. Cooperation of everyone in the business
9. Integration automation
10. Publishing standards for cartographic quality, paper, web, and mobile
11. Consumer feedback process loops
12. Additional ones for your organization…

Geospatial Data Governance

…is NOT a "one act play"

✓IS a way of doing business using geospatial data, every day.

Inquire. Collaborate. Spread the word.

For your organization's geospatial data governance strategy, ask for help. Collaborate with others.

It is not an easy road, but well worth the venture. Remember, it's a journey – a strategy, not a project.

Thanks for listening today, thanks for participating, and spread the word…

One day, someone might thank you for helping them make better decisions and helping to avoid senseless accidents…

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https://www.linkedin.com/company/3228450?trk=mini-profile-title

Ten half-marathons run to raise awareness and money for Cystic Fibrosis research.

Gus and Ellen Nodwell, Co-Chairs and volunteers for Montgomery County CASA Super-Hero Run (2013, 2014).

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