

Auditing Your GIS:

Evaluating Quality Management, Consistency, & Mitigating Risk

2016 EPUG
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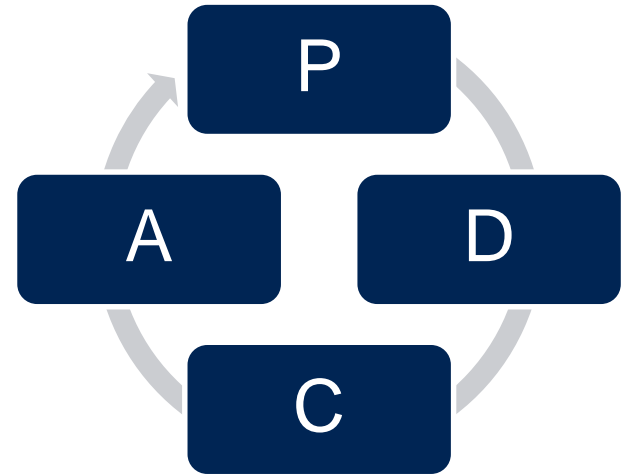


Overview



Overview

- What is “Auditing your GIS”?
 - Development
 - Execution
 - Reporting
- Why should we audit?
- How can we identify & mitigate risk?




Background

- Technical SME Only
 - BA, MS, GISP
 - Key Functions, Tasks, and Procedures
- DOF Subsea
 - ISO9001:2015 – Quality Management System




What is a GIS Audit?





POSITIVE DIRECTIONS



NORTH CAROLINA
State Board of Elections

SEIMS Workshop

GIS AUDIT PROCESS, NCSBE PRECINCTS AUDIT
INTERACTIVE MAP TOOL AND PROCESSING ABSENTEE
REQUESTS IN VOTERSCAN

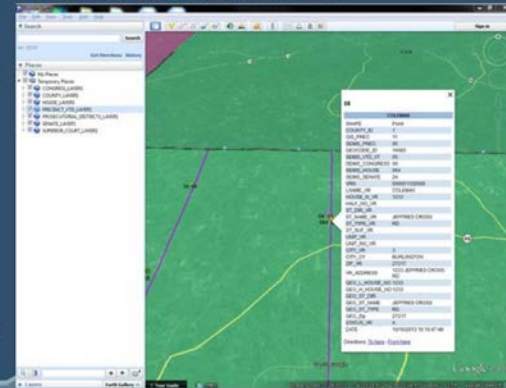
Viewing Audit Data

In the example shown, Google Earth is being used to review the audit files. If your county does not have GIS software, Google Earth is a free alternative.

All layers that have been imported appear in the Temporary Places column on the left.

Click on any dot on the map to reveal all pertinent geocode information. Double-click the dot to zoom-in to street level view.

Review each dot and make corrections in Geocode as necessary.

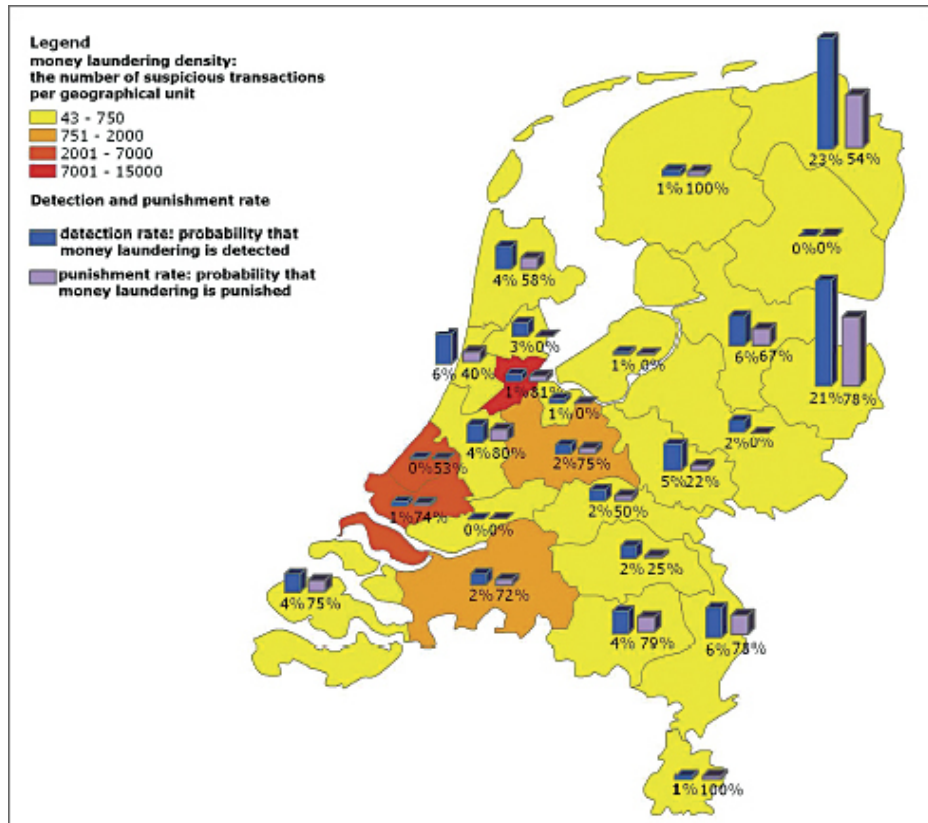


- Ex. Voter Districting given Legislative Requirements

What is a GIS Audit?

Using GIS as a tool for accountability and transparency

- Ex. Ensuring proper flow of international aid using GIS

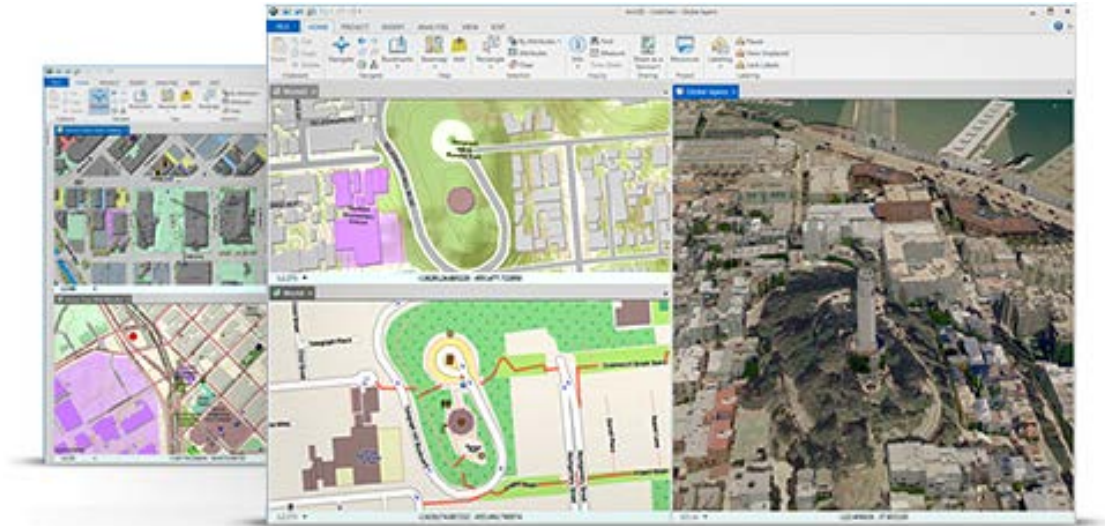


<http://www.esri.com/news/arcnews/summer10articles/using-gis.html>

What is a GIS Audit?

Is the data in your GIS fit for use or purpose?

- Are we collecting the data we need?
- Is the data and its use up to industry standard?



<http://www.esri.com/~media/Images/Content/Software/arcgis/arcgisonline/graphics/whats-new-103/asset1>

What needs to be audited?

- Data?
 - Against what standards?
- Procedures?
 - Quality Management System?
- Personnel?
 - What is the accepted GIS competency schema?
- **What are the contractual requirements?**

General Contract for Products

This General Contract for Products (the "Contract") is made effective as of April 10, 2012, between the Government, Inc. of 100 Main Street, Suite 100, San Francisco, California 94102 ("Buyer"), and Seller, Inc. of 123 Main St., San Francisco, California 94102 ("Seller").

1. ITEMS TO BE ORDERED: Seller agrees to sell, and Buyer agrees to buy, the following products (the "Items") in accordance with the terms and conditions of this Contract:

Description	Quantity	Unit Price	Total Price
Item 1: 1000	1000	\$1.00	\$1,000.00
Item 2: 500	500	\$2.00	\$1,000.00
Item 3: 100	100	\$10.00	\$1,000.00
Item 4: 100	100	\$10.00	\$1,000.00
TOTAL:			\$4,000.00

2. PAYMENT OF ORDER: The Buyer shall comply with the specifications in the attached Contract and shall accept the Seller's terms of sale.

3. TITLE AND RISK OF LOSS: Title to and risk of loss of goods shall pass to the Buyer upon delivery of the goods to the Buyer's premises or to a carrier for delivery to the Buyer's premises, whichever occurs first.

4. PAYMENT: Payment shall be made to Seller by Buyer within 30 days of the date of delivery of the goods to the Buyer's premises or to a carrier for delivery to the Buyer's premises, whichever occurs first.

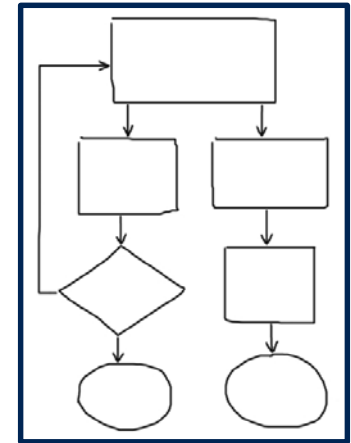
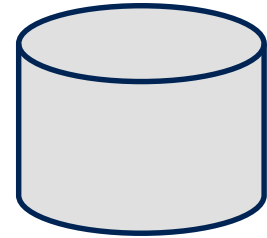
In addition to any other rights or remedies provided by law, if Buyer fails to pay for the goods within 30 days of the date of delivery, Seller shall be entitled to sue Buyer for the amount of the goods not paid for by Buyer, including reasonable attorney's fees and costs of collection.

5. DELIVERY: Seller is to deliver the goods to the Buyer's premises or to a carrier for delivery to the Buyer's premises, whichever occurs first, by the date specified in the Contract.

6. PAYMENT OF ORDER: Buyer shall pay for all items of goods, including freight, insurance, and handling, and shall pay for the cost of delivery to the Buyer's premises or to a carrier for delivery to the Buyer's premises, whichever occurs first.

7. WARRANTY: Seller warrants that the goods shall be free of substantial defects in material and workmanship and in conformity with industry standards.

8. FORCE MAJEURE: In the event of a force majeure event, Seller shall be excused from its obligations under the Contract for a period of 90 days after the event, provided that Seller shall use its best efforts to resume performance as soon as possible.



Executing Your Audit

- Developing Technical Scope

What is industry best practice?

VS.

What are the contractual requirements?

Management of Third Party Contractor Data (Applicable for each Use/Area)

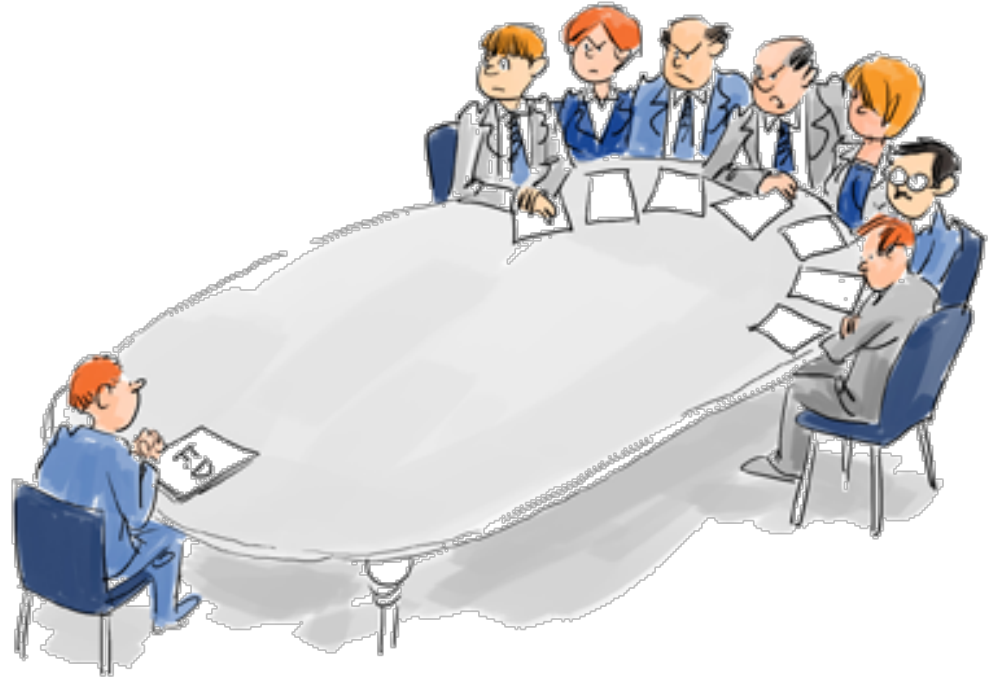
- a. Data Standards Documentation
 - i. Applicable Data Model Documentation
 1. ArcGIS Version
 2. Horizontal Datum Info
 3. Vertical Datum Info & +/- Convention
 4. Dataset Nomenclature Requirements
 5. Feature Class Overview
 6. Feature Data Dictionary
 7. Raster Data Standards
 8. Metadata Standards
 - ii. Applicable Data Model Template
 - iii. Data Retention Policy
- b. Data Transfer Protocols
 - i. Data Format & Transfer
 - ii. Data Security Minimums
 - iii. Chain of Custody
- c. Data Integration Procedures
 - i. Data QC & Acceptance
 - ii. Data Integration into Client architecture
 1. Integration of contractor GIS deliverables
 - a. Geophysical
 - b. Visual
 2. Storage Plan for Raw and Processed Data
 3. Cataloguing data
 - a. Location
 - b. Contractor
 - c. Date
 - d. Type
 - e. Original media
 - f. Backup location
- d. Data Export to Third Party
 - i. Written Procedure
 1. Contractor Data/Information Request Process
 2. QA/QC of Data to Contractors
 3. Security of transfer media
 - ii. Data Chain of Custody Tracking

Executing Your Audit

- Conducting the Audit

Purpose: to verify requirements have been met and identify areas for improvement.

We don't want you to view this audit committee as being in any way confrontational...



http://orig06.deviantart.net/19b4/f/2015/011/4/1/t_ias_161_cartoon_audit_confronterend_by_cartoonartservices-d8dgxjd.png

Executing Your Audit

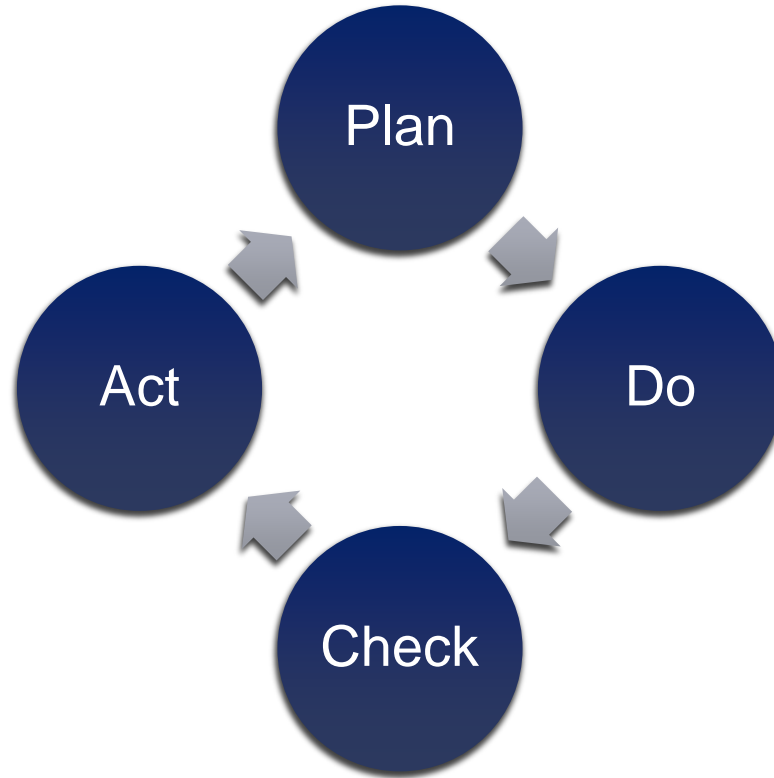
- Reporting
 - Examples of Industry Best Practice
 - Specific Contractual References

AUDIT - DESCRIPTION	
Document No: Insert no.	Document Title: Insert no.
Version No: No.	Date: dd.mm.yyyy
Audit class: <input type="checkbox"/> Internal <input type="checkbox"/> Supplier (External) (Tick off)	Project No: Insert no. Audit No: Insert no.
AUDIT ORGANISATION: Insert organisation	DATE(S) OF AUDIT: Insert date(s)
AUDIT LOCATION: Insert location (address)	REPRESENTATIVE OF AUDITED ORGANISATION: Insert name and position (title)
REFERENCE DOCUMENTS: Insert document no. and title	DISTRIBUTION: Insert name, position (title) and company
AUDIT CRITERIA: (Tick off the criteria used) <input type="checkbox"/> ISO 9001 <input type="checkbox"/> Business Management System <input type="checkbox"/> ISO 14001 <input type="checkbox"/> Purchase Orders <input type="checkbox"/> OHSAS 18001 <input type="checkbox"/> Frame Agreements <input type="checkbox"/> ISO 20000 <input type="checkbox"/> Client Contracts <input type="checkbox"/> ISO 27002 <input type="checkbox"/> Financial Standards <input type="checkbox"/> Laws and regulations <input type="checkbox"/> Best practice <input type="checkbox"/> Other criteria: specify:	AUDIT OBJECTIVE: Insert description of audit objective
AUDIT TEAM: • Insert audit team members (identify lead auditor)	PARTICIPANTS: • Insert participants name and position (title)
AUDIT - general impression	
> Insert key points of overall impression from audit	
AUDIT - RESULTS	
No. of NCR's:	No. (No. Major / No. Minor)
No. of Observations:	No.
No. of Noteworthy efforts:	No.
High 5 <input type="checkbox"/>	MAIN FINDINGS (Main NCR's and Observations): > Insert main findings POSITIVE INDICATORS (Main Noteworthy efforts): > Insert main positive indicators
4 <input type="checkbox"/>	
3 <input type="checkbox"/>	
2 <input type="checkbox"/>	
Low 1 <input type="checkbox"/>	
Degree of control	
Legislation and Other Requirements - Compliance	
> Insert positive or non-compliance findings	
AUDIT - INSTRUCTIONS FOR CLOSURE	
Deadline for feedback:	dd.mm.yyyy (See also attached findings list)
Required feedback on non-conformities (Major / Minor):	
> Corrective action and implementation plan to be presented.	
Feedback on observations:	
> Response requires comments or intention of follow-up. Area can be subject for next audit.	
Note: All NCRs and observations to be closed out in 2 weeks.	

Why should we audit?



Objective: Continuous Improvement



GIS Risks?

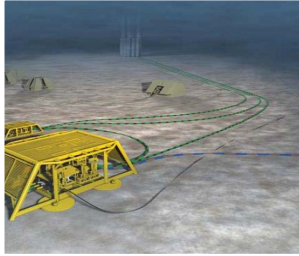


Propagating Risk

Geohazard



Engineering



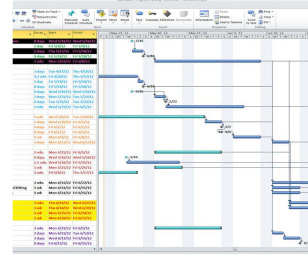
Construction



Rework



Project Delays



How did we audit?



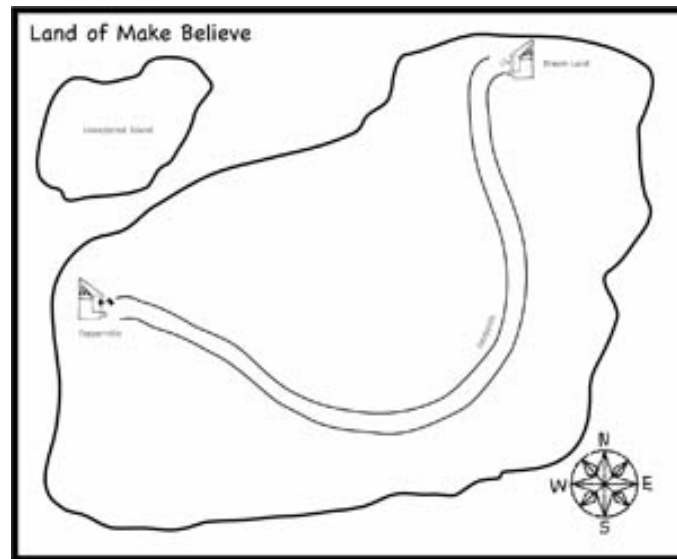
What did we do?

- Technical / Industry “Best Practice” Audit
 - Pre-FEED
 - Pre-Engineering Survey Data
 - Technical Capacity Only
- Develop, Execute, & Report
 - Identify Areas for Improvement
 - Standards Recommendations



What did we do?

- Execution
 - Procedures & Processes
 - Review Data Management Plan
 - Determine Record & Archiving
- Results
 - Technical Audit Was Successful
 - Designed to Report on & Provide Constructive Feedback
 - Minor areas for Improvement

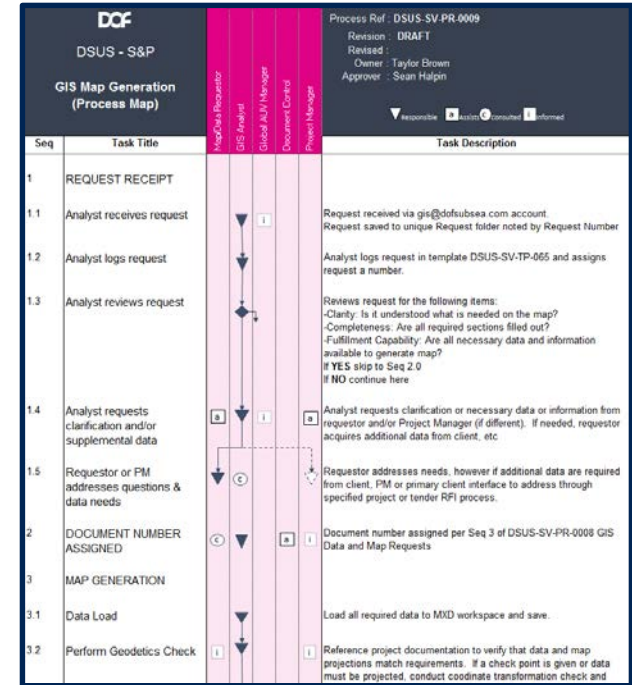


Identifying Success & Mitigating Risk



Identifying Success

- Client
 - ID'ed areas for improvement
 - Better defined expectations
 - Identify and Mitigate Risk
- GIS Dept
 - Improved processes
 - Better understand expectations to deliver
- Technical SME
 - Use internal Quality & Data Management standards
 - Lessons learned for our own group



Why were we successful?



Quality Data Management

- **Benefits**
 - Standardization
 - Risk Management
 - Data Continuity
 - Product Consistency



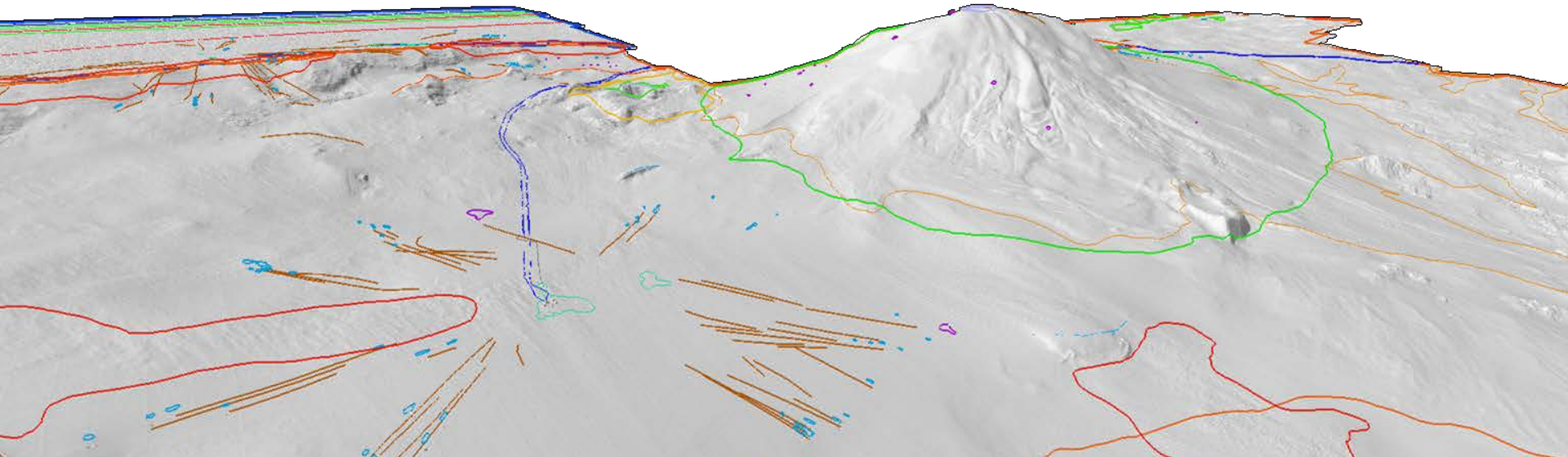
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Acknowledgements



Acknowledgements

- DOF Subsea
 - Global AUV Group
 - HSEQ Department
- ESRI PUG
- IOGP SSDM Task Force



Thank you!

