DIGITAL MAPPING TECHNIQUES 2021

The following was presented at DMT'21
(June 7 - 10, 2021 - A Virtual Event)

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2021)

http://ngmdb.usgs.gov/info/dmt/

GeMS-in-Excel

as Delivery Mechanism

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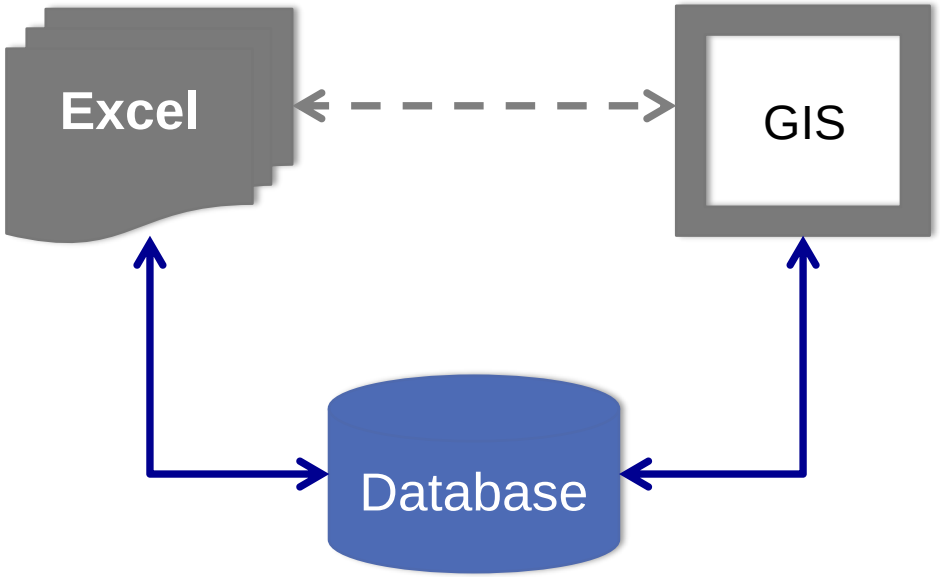
USGS Grant G20AC00014

Undoubtedly, Excel is everyone's go-to software for tabular data entry, manipulation, analysis and visualization. Excel is also a developer's dream: it is fast, portable, stable, and extensible, with APIs attuned to the user interface that the world already knows.

For over a decade, I have been programming scientific data management in Excel. Through the NCGMP-funded coop at UC Santa Barbara, I am now exploring how to leverage Excel for geologic maps, GeMS specifically. In my DMT21 talks, I show how Excel can be utilized to:
1) deliver our geologic maps to end-users, many of whom lack or eschew GIS software; and
2) facilitate end-users' own work with our geologic maps, in field engineering, resource studies, survey, etc.

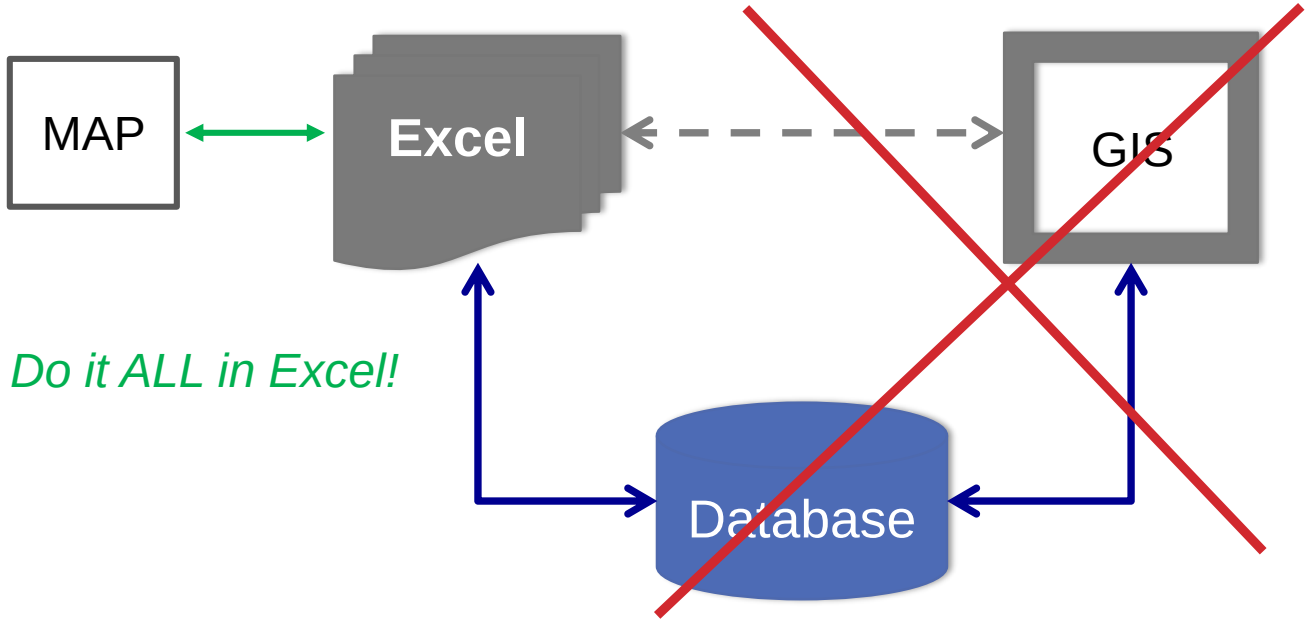
FOREGROUND

Try something new **Same old**



FOREGROUND

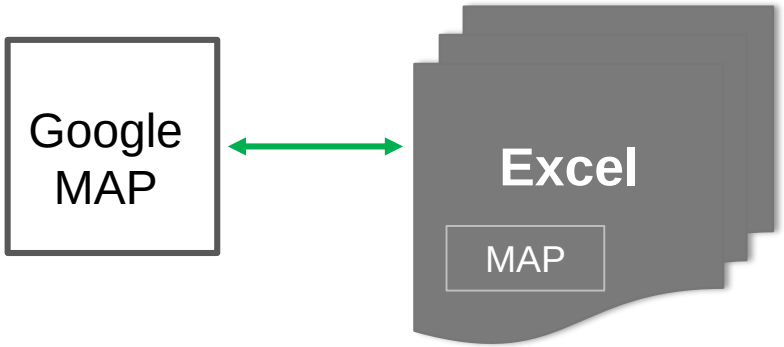
Try something *really* new **Same old**



FOREGROUND

Simplify, simplify

Different focus – the map-user



OUTLINE

Tahoe-Donner Map

Excel Out-of-the-Box

- **Tabular connections**
- **Mapping capabilities**

Google My Maps (not Earth)

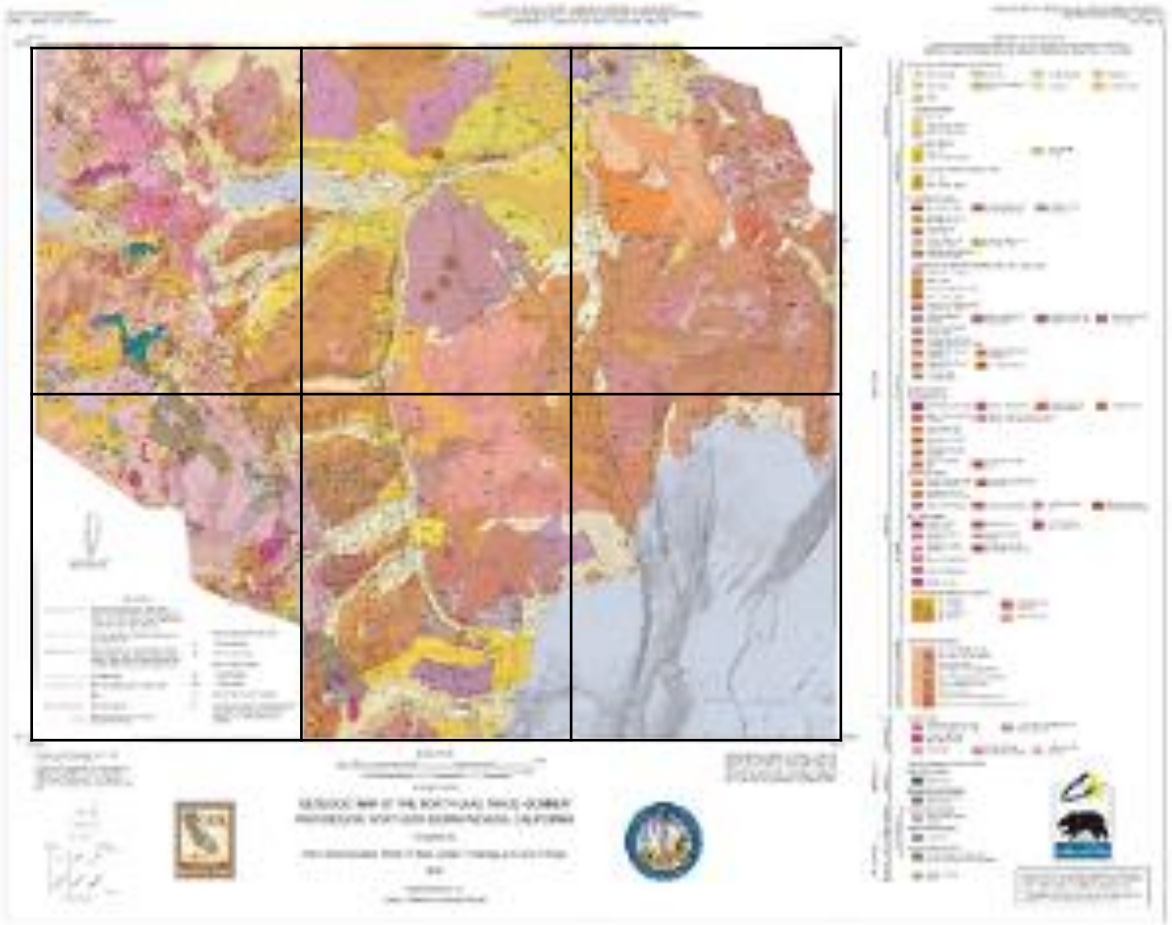
Preparations in ArcGIS

GeMS Delivery to End-User

- **Excel tables, thumbnail map**
- **Google Map, spatial data**

Tahoe-Donner Map

Sylvester, A.G. & al. (2012)
a cast of hundreds



Compilation map
Six Quads:

Top row (l-to r):
Norden,Truckee,
and Martis Peak

Bottom:Granite
Chief, Tahoe City,
and Kings Beach

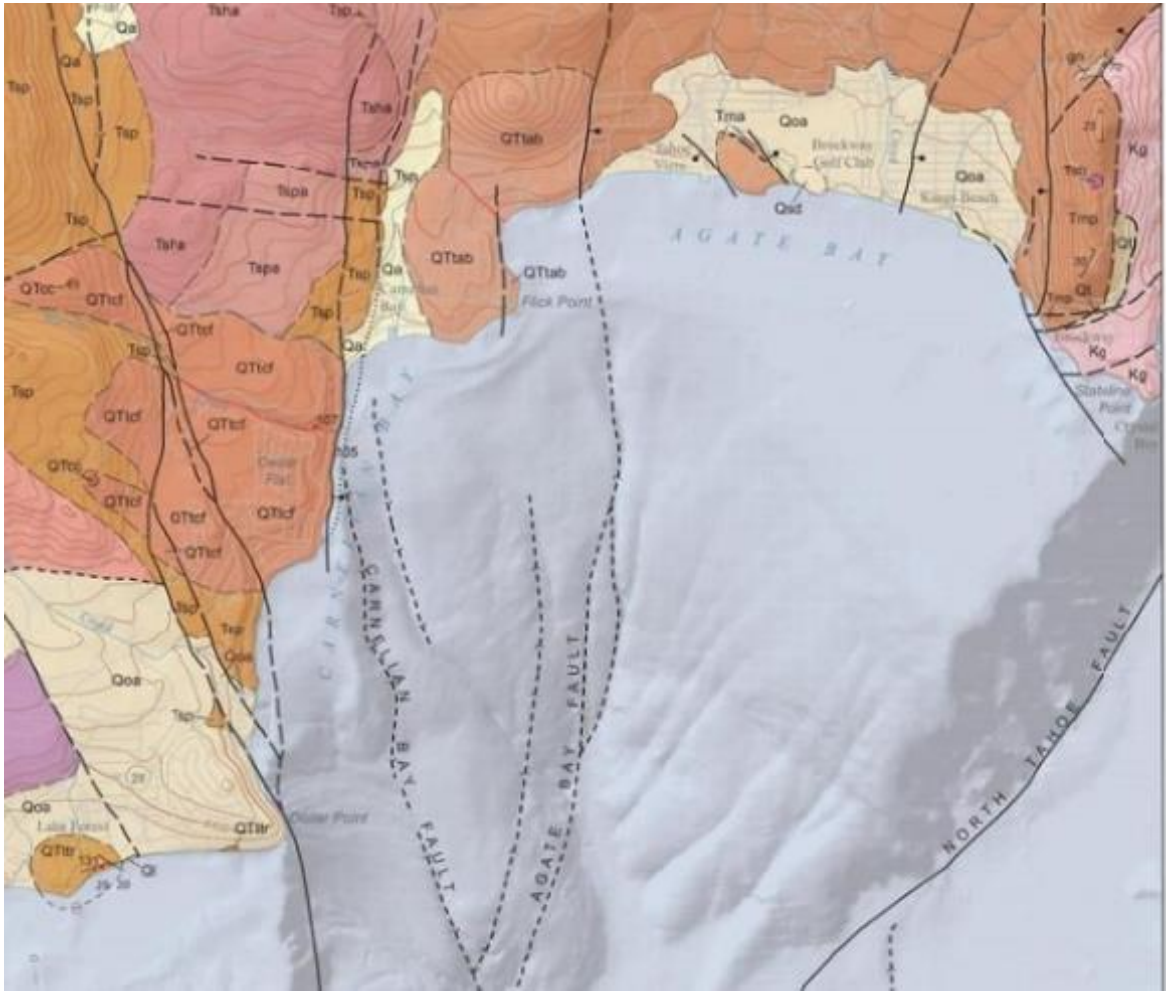
Downloads from CGS
>450 as .pdf
digital not available

https://ngmdb.usgs.gov/Prodesc/proddesc_101468.htm

Tahoe-Donner Map

Kings Beach Quad

Simplify, simplify

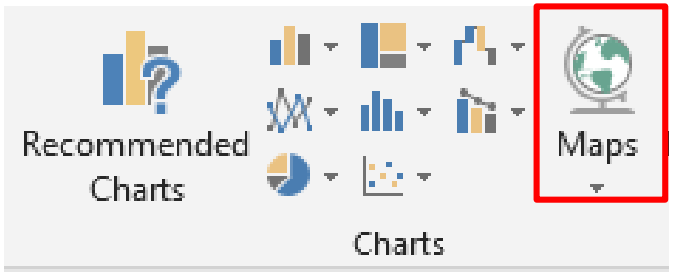


Relatively **simple geology**

- Surficial and Igneous units
- Fault structure “in your face” still active and well studied -- even in the lake
- Intra-unit contacts (from lava flows)
- Fine cartography

EXCEL OUT-OF-THE-BOX

	A	B
1	**Name**	**Pop(000)**
2	California	40,000
3	Nevada	3,500

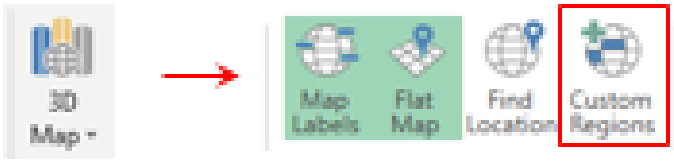


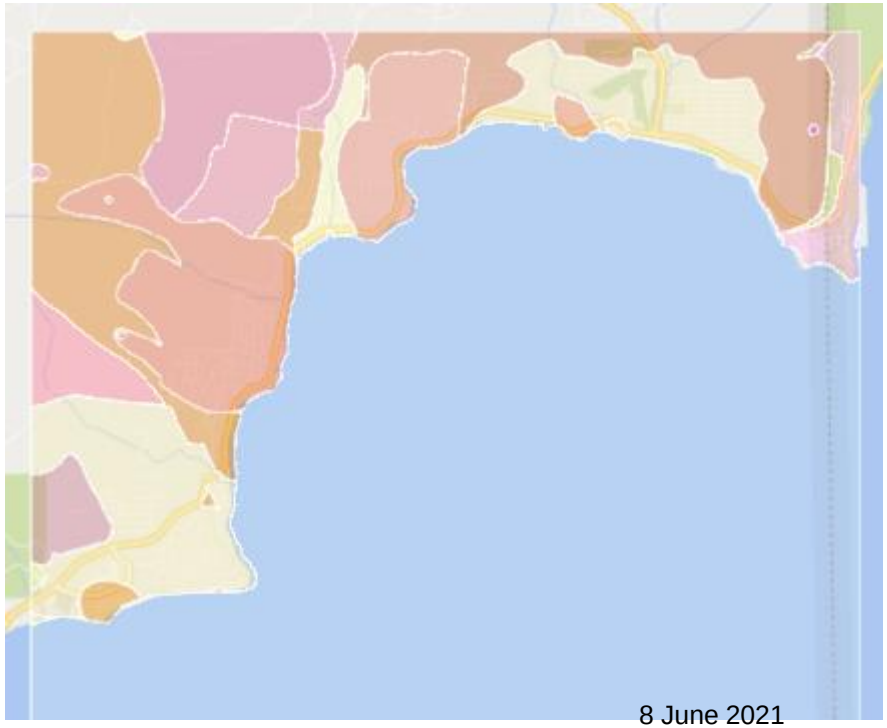
EXCEL OUT-OF-THE-BOX

	A	B	C
1	**County**	**State**	Pop(000)
2	Placer	CA	150
3	El Dorado	CA	250
4	Washoe	NV	400
5	Carson City	NV	75
6	Douglas	NV	50

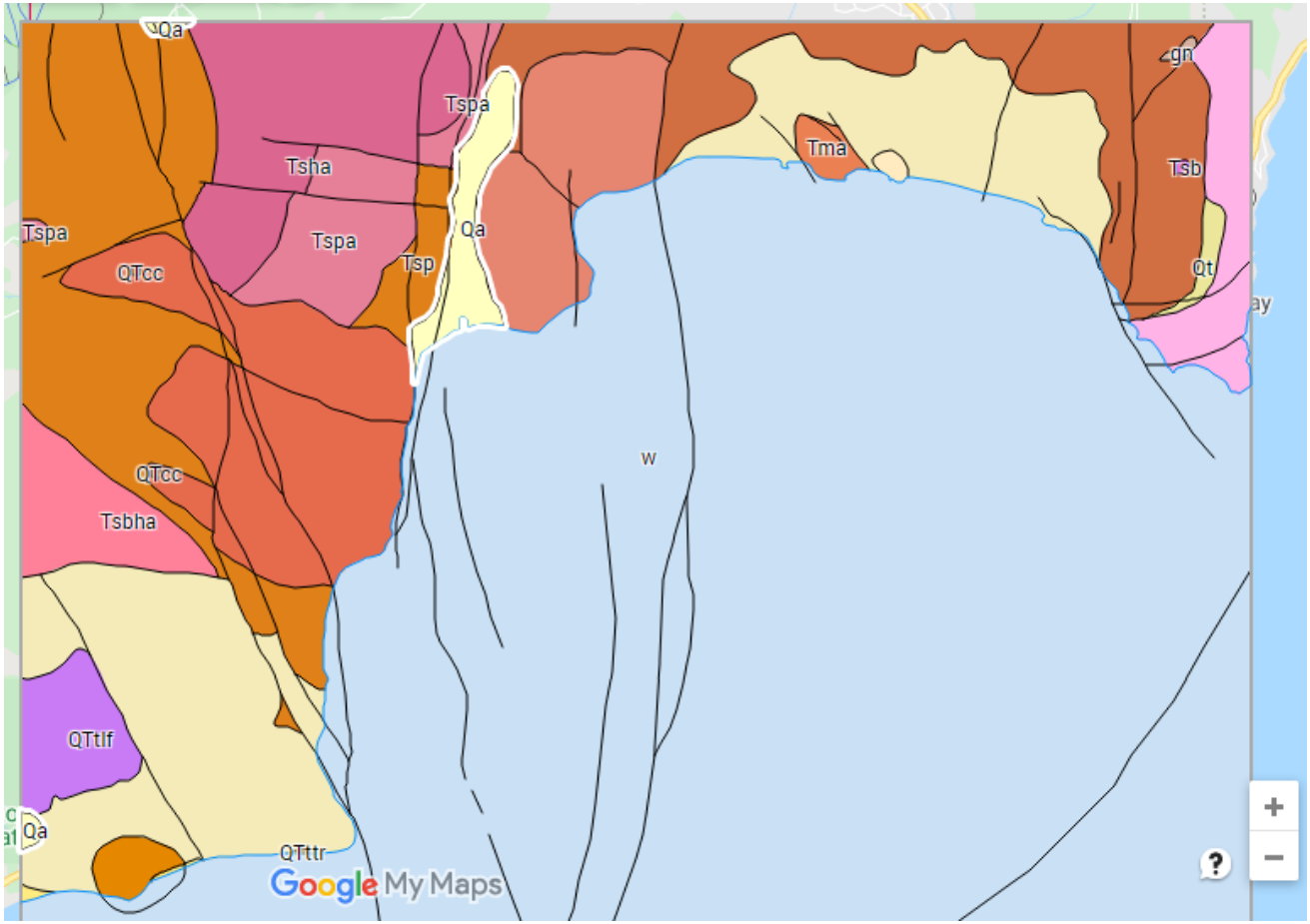
EXCEL OUT-OF-THE-BOX

	A	B	C	D	E	F	G
1	OBJECTID	MapUnit	IdentityCc	Label	Symbol	DataSourc	Notes
2	1	w	certain	w		DAS0005	
3	2	w	certain	w		DAS0005	
4	3	w	certain	w		DAS0005	
5	4	w	certain	w		DAS0005	
6	5	Ql	certain	Ql		DAS0005	
7	6	w	certain	w		DAS0005	
8	7	Ql	certain	Ql		DAS0005	
9	8	Ql	certain	Ql		DAS0005	
10	9	QTttr	certain	QTttr		DAS0005	
11	10	QTttr	certain	QTttr		DAS0005	
12	11	Qa	certain	Qa		DAS0005	





GOOGLE MY MAPS



PREPARATIONS in ArcGIS

Started with clip of Kings Beach quad

1. **Re-projected from NAD27 UTM to Mercator**
2. **Made a Personal Geodatabase (for now)**
3. **Merged MUPs → MUP2 on unit label**
4. **Exported MUP2 as shapefile**
5. **Merged CAFs on upper 2-digit symbol (“LType”)**
6. **Converted MUP2 and CAF2 to .kmz**

GeMS DELIVERY

in Google My Maps

1. Import MUP2 and CAF2 – spatial data (as .kmz)
2. Create a shared Web link

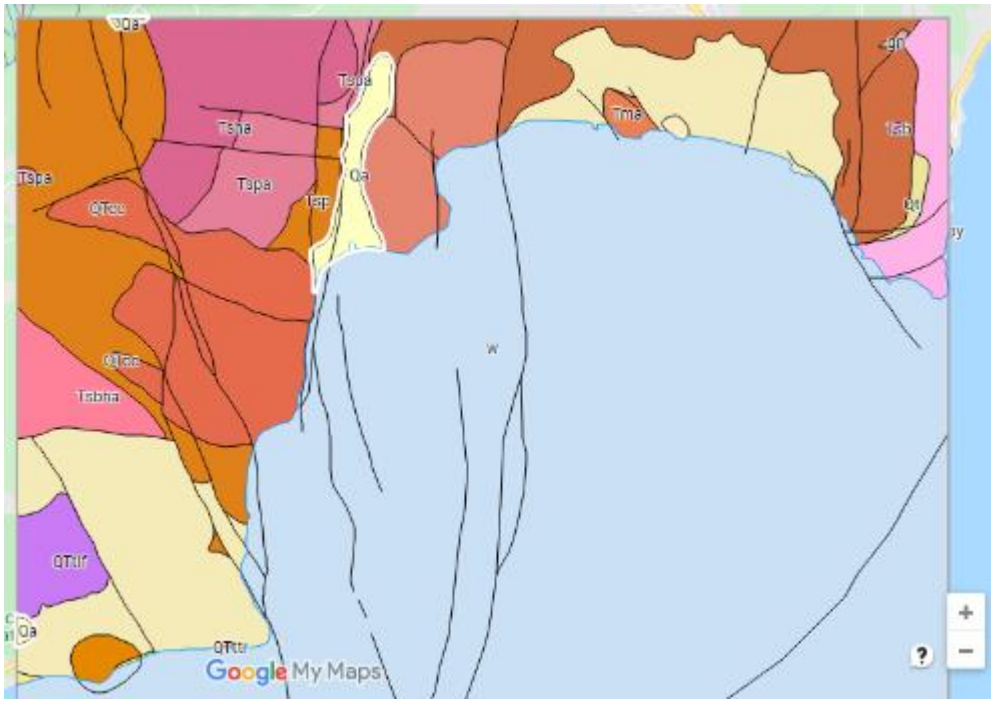
in Excel

1. Query MUP, MUP2, CAF – tabular data (as .xlxs)
2. Open 3D Maps, use MUP2 shapefile to define regions
3. Use MUP2 worksheet to create thumbnail
4. Link 3D Map to Google MyMap

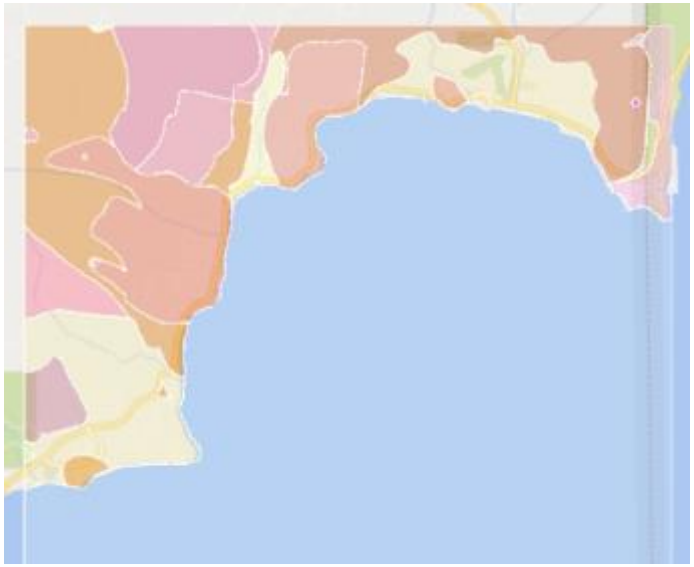
GeMS DELIVERY

LIVE

Google



Excel



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https://www.google.com/maps/d/u/0/edit?mid=1hosSKHkrawOsLmPOenYlljWYJ1UFv7r9&usp=sharing

GeMS DELIVERY in Excel & Google

Features & Benefits

A. Tabular data easily accessible in Excel

1. **Look-see outside any GIS**
2. **Queryable and exportable**

B. Spatial data available, usable multiple ways

1. **Summary as .kmz (widely importable)**
2. **Full detail as .mdb (GIS importable, single file)**
3. **Shapefiles & .gdb (GeMS spec)**

SUMMARY

Advantage Excel, infact

1. Known and loved

2. Technically proficient

- ✓ Portable
- ✓ Powerful
- ✓ Programmable
- ✓ Already installed

3. Operationally efficient

- ✓ Stable
- ✓ Permanent

THANKS!

[end]