



# CAN YOU DIGG IT

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# SO WHAT IS DIGGS

- Data Interchange for Geotechnical and Geoenvironmental Specialists
- Data Transfer Protocol
- Not a Database
- <https://www.geoinstitute.org/special-projects/diggs>



# WHAT IS A DATABASE

- Database – a usually large collection of data organized especially for rapid search and retrieval (as by a computer)



**WHERE DOES OUR  
INFORMATION  
COME FROM**





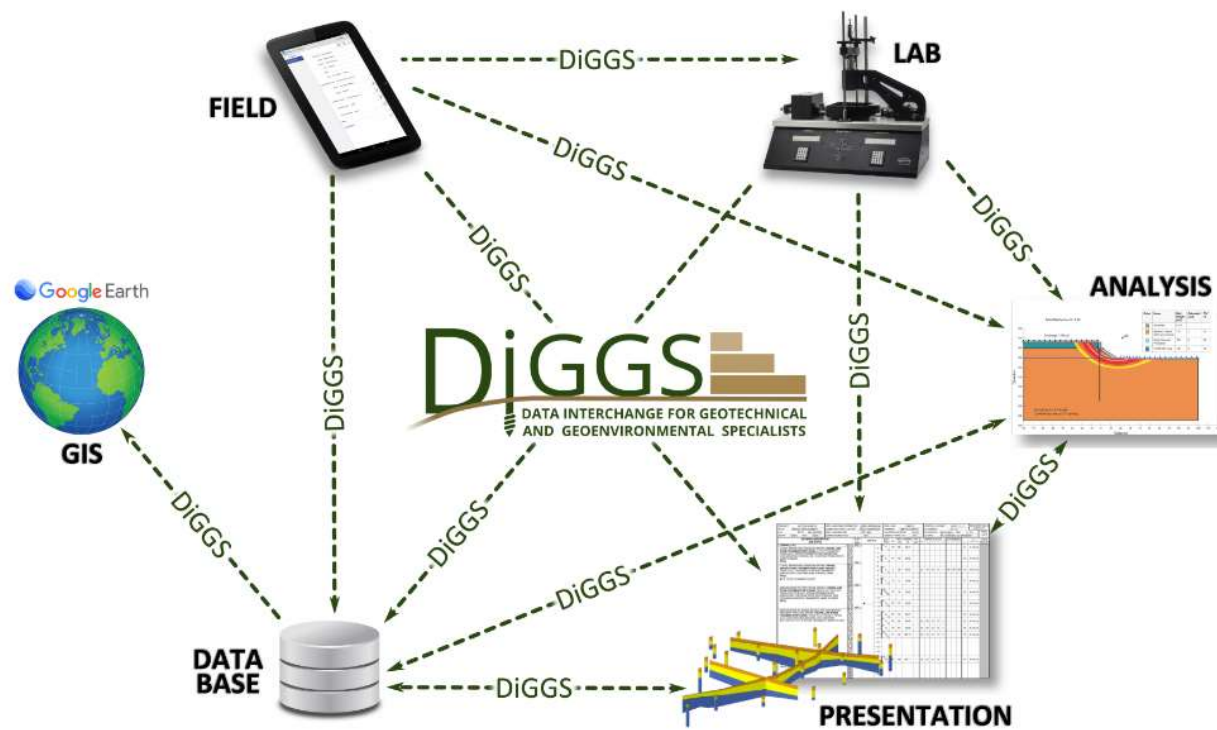




Atterberg Limits	Lab	includes both Fall Cone and Casagrande test for liquid limits
Driven Penetration test	In situ	includes SPT and other hammer-based penetration tests
Particle Size	Lab	includes both sieve and hydrometer tests
Chemical tests	Lab	
Compaction	Lab	includes Proctor, Modified Proctor, Porter Static, California Test 216
Density	Lab	
Photolonization Detector test	Lab	
Specific Gravity	Lab	
Shrinkage Limit	Lab	
Static Cone Penetration test	In situ	e.g., CPT
Water Content	Lab	
Wireline logs	In situ	includes any kind of downhole sensors, including suspension velocity logs

- Current tests vetted and ready for use/adoption
- Future inclusions include:
  - Several Aggregate tests
  - Compressive Strength
  - Consolidation
  - Triaxial Tests
  - Other Insitu and Lab tests







# SO AGAIN... WHAT IS DIGGS

- XML Schema Definition (XSD)
- Dictionaries defining controlled terms and coordinate systems, and business rules
- Data transfer as XML (structured text) that follows the DIGGS rules
  - Everyone knows how to read it
- Basically the same language web pages are written in

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <Diggs xmlns="http://diggsml.org/schemas/2.0.b" xmlns:diggs="http://diggsml.org/schemas/2.0.b"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:g3.3="http://www.opengis.net/gml/3.3"
  xmlns:glr="http://www.opengis.net/gml/3.3/1r" xmlns:glrov="http://www.opengis.net/gml/3.3/1r"
  xmlns:diggs_geo="http://diggsml.org/schemas/2.0.b/geotechnical" xmlns:witsml="http://www.witsml.org/schemas/131"
  xsi:schemaLocation="http://diggsml.org/schemas/2.0.b/Complete.xsd" gml:id="bcd">
3   <documentInformation>
4     <DocumentInformation gml:id="d1">
5       <creationDate>2019-01-30</creationDate>
6       <effectiveDate>2019-01-30</effectiveDate>
7       <authorRef/>
8       <author>WSP</author>
9       <sourceSoftware>
10        <SoftwareApplication gml:id="diggit">
11          <gml:name>Diggit v1.0</gml:name>
12        </SoftwareApplication>
13      </sourceSoftware>
14    </DocumentInformation>
15  </documentInformation>
16  <project>
17    <Project gml:id="123">
18      <gml:name>Test Project</gml:name>
19      <contract>
20        <Contract gml:id="contract">
21          <gml:name>c-123</gml:name>
22          <client>Client 3</client>
23          <contractor>Contractor name</contractor>
24        </Contract>
25      </contract>
26    </Project>
27  </project>
28  <samplingFeature>
29    <Borehole gml:id="B-1">
30      <gml:name codeSpace="usgs">urn:diggs:def:fi:USGS:B-1</gml:name>
31      <projectRef xlink:href="#p1"/>
32      <referencePoint>
```

# SO AGAIN... WHAT IS DIGGS

- Geography Markup Language (GML)
  - Data is tied to a location and the geometry of the feature
  - Elements are located in space
  - They don't have to be vertical or linear
- Extensible
  - We can add other things
  - Geophysics, Piles, Instruments, MWD, etc

LIQUID AND PLASTIC LIMIT TESTS

Project Diggs Example Date 18 Dec 2015  
 Boring No. DP-2A Sample No. 14

		LIQUID LIMIT					
		1	2	3	4	5	6
Run No.		1	2	3	4	5	6
Tare No.		4	15	23	8		
Tare plus wet soil		63.1	60.2	58.1	67.4		
Tare plus dry soil		49.3	49.1	49.7	58.8		
Water	$w$	13.8	11.1	9.2	8.6		
Wet		10.1	10.3	9.8	10.8		
Dry soil	$w$	39.2	38.8	39.9	48.0		
Water content	$w$	35.2	28.6	28.1	17.9		
Number of blows		16	22	27	32		

Weight in grams

Graph: Water content,  $w$  (%) vs. Number of blows (log scale).  
 Points plotted: (16, 35.2), (22, 28.6), (27, 28.1), (32, 17.9).  
 Liquid Limit (LL) = 25, Plastic Limit (PL) = 13, Plasticity Index (PI) = 12.  
 Symbol from plasticity chart: CL

		PLASTIC LIMIT					Natural Water Content
		1	2	3	4	5	6
Run No.		1	2	3	4	5	6
Tare No.		5	2	18			
Tare plus wet soil		22.3	25.1	19.7			70.3
Tare plus dry soil		24.0	23.6	18.7			60.2
Water	$w$	1.7	1.5	1.0			10.1
Wet		12.1	10.8	9.9			10.3
Dry soil	$w$	10.9	12.8	8.8			49.9
Water content	$w$	11.9	11.7	11.4			20.2
Plastic limit		12					

Remarks: Liquidity Index = 0.66 PI = 13

Technician RCB Computed by RCB Checked by DP

```

<measurement>
  <Test gml:id="atterberg">
    <gml:name>Atterberg Limits Test</gml:name>
    <role>
      <Role>
        <rolePerformed>Technician</rolePerformed>
        <businessAssociate>RCB</businessAssociate>
      </Role>
    </role>
    <role>
      <Role>
        <rolePerformed>Computed by</rolePerformed>
        <businessAssociate>RCB</businessAssociate>
      </Role>
    </role>
    <role>
      <Role>
        <rolePerformed>Checked by</rolePerformed>
        <businessAssociate>DP</businessAssociate>
      </Role>
    </role>
    <remark>
      <Remark>
        <content>Liquidity Index = 0.66; PI = 13</content>
      </Remark>
    </remark>
    <investigationTarget>Natural
      Ground</investigationTarget>
    <projectRef xlink:href="#DiggsExample"/>
    <relatedSamplingFeatureRef xlink:href="#DP-2A"/>
    <sampleRef xlink:href="#s14"/>
    <resultTime>
      <TimeInterval gml:id="t3">
        <start>2015-12-18</start>
      </TimeInterval>
    </resultTime>
    </outcome>
  </Test>
</measurement>
    
```

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# CURRENT VENDOR ENGAGEMENT



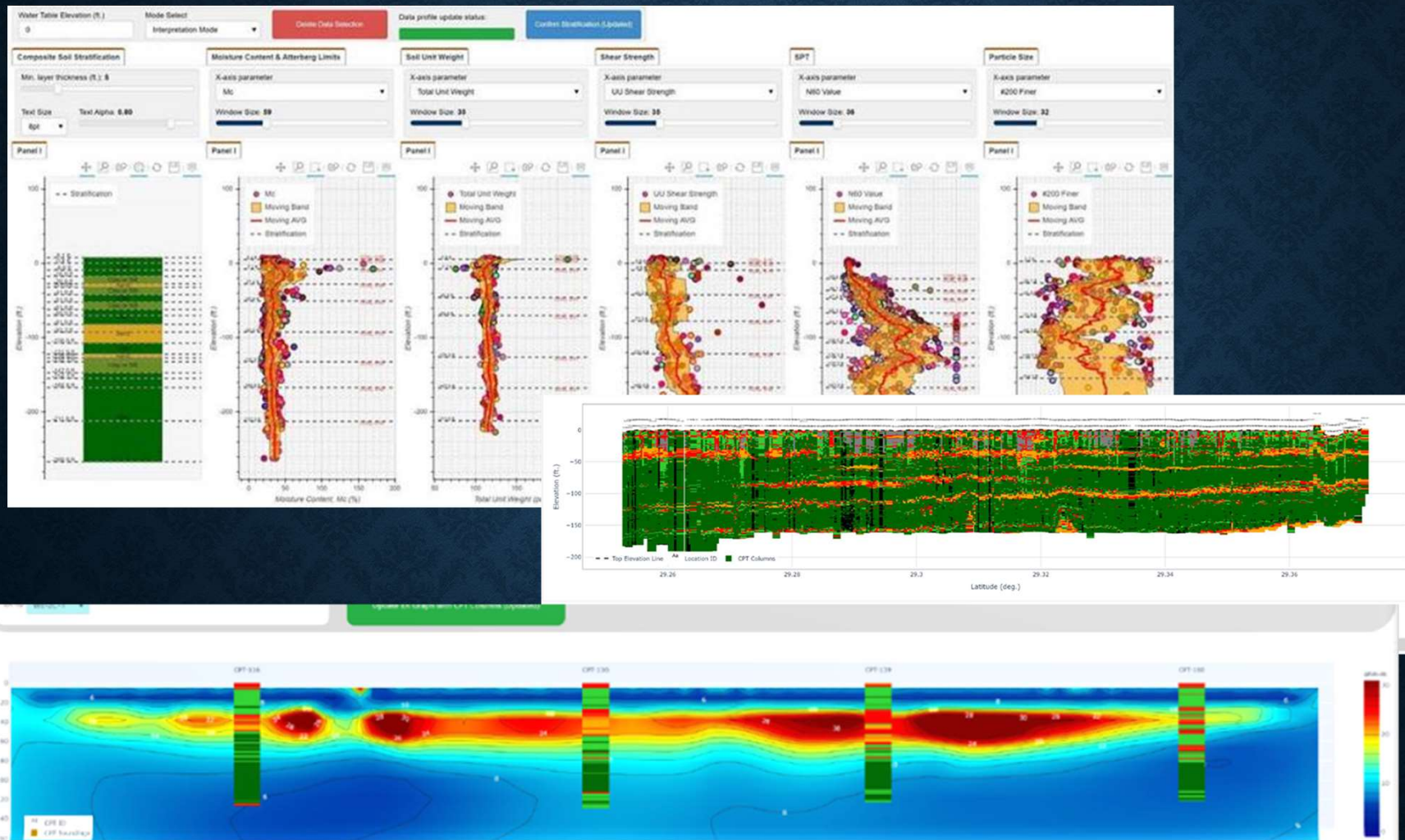
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# **DIGGS is not a Database**

## **DIGGS is not a scheme to collect and share data**

- Select groupings of explorations
- Plot moisture, unit weight, shear strength, N-values, fines content, etc. with depth
- Develop tools to provide the statistics of the data
- Present a suggested stratigraphy
- Delete outliers and see the impact





Xin Peng, Ardaman and Jesse Rauser, LADOT

# EXPORTING DIGGS DATA

## Download Project Data ×

Download boring data as Excel, PDF or DXF files. Download maps as Excel (Boring ID, Lat, Long) or DXF files. Configure PDF boring data on the Templates tab, and configure PDF map data on the Site Maps tab.

### Select download type

Project and Log Data - DIGGS × Download formats ▼

### Select borings

Borings ▼

**Download**



# IMPORTING DIGGS DATA

## Upload

Bring data from gINT, Excel, KML, and other file formats into your BoreDM projects

Upload [View Mappings](#)

### Step 1

Upload a gINT (.gpj), Excel (.xlsx or .csv), or Google Earth (.kml or .kmz) file



Click to select a file

Next

## DIGGS Upload



Nice work uploading a DIGGS file! Would you like to select more DIGGS files to upload as a batch?

- ☒ Just this file
- ☐ Batch upload multiple DIGGS files

Next

# IMPORT DIGGS INTO GEOGIS

Pending Documents for Project: BR-0014(552) CPMS: 100070678

Security Level

Low

Select Pending Document

Browse Files To Add

Remove Selected File

100%

Saving to database ...

Please make sure your document is locked before you upload.  
Currently file sizes up to 2 GB are supported.

Cancel

Finalize Document(s)



**I HOPE YOU CAN TELL SOMEONE WHAT DIGGS  
IS NOW**

- Special Thank You to Allen Cadden with Schnabel Engineering

**Thank You**

