

# Environmental Data Management on USACE, Omaha District Projects

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April 13, 2016



US Army Corps of Engineers  
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# Outline

- Background
- Previous data management processes
- Difficulties and challenges
- Improvements and applications of best practices
- Lessons learned



# Background

- Formerly Used Defense Sites (FUDS)
- Majority of projects are contracted out
- Chemical data must be uploaded to FUDSChem
  - Staged Electronic Data Deliverables (SEDDs)
  - XML format

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<ReportedResult>  
  <AnalysisGroupID>115974</AnalysisGroupID>  
  <AnalyteName>1,1,1-Trichloroethane</AnalyteName>  
  <AnalyteType>Target</AnalyteType>  
  <CASRegistryNumber>71-55-6</CASRegistryNumber>  
  <ClientAnalyteID>71-55-6</ClientAnalyteID>  
  <Comment></Comment>  
  <DetectionLimit>11</DetectionLimit>  
  <DetectionLimitType>DL</DetectionLimitType>  
  <DetectionLimitUnits>ug/kg</DetectionLimitUnits>  
  <ExpectedResult></ExpectedResult>  
  <ExpectedResultUnits>ug/kg</ExpectedResultUnits>  
  <LabAnalysisID>597217</LabAnalysisID>  
</abQualifiers>1</abQualifiers>
```



# Former Offutt Air Force Base Atlas “D” Missile Site 3



- Image source: [siloworld.net](http://siloworld.net)



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# Offutt Site 3 - continued



# Previous Data Management Processes

- Contractors provided data to project chemists
  - Data retained in a network folder
- EDMS database for in-house work
  - A1/A3 files
- This wouldn't work for Offutt Site 3



# Difficulties and Challenges

- Huge number of samples and analyses
  - Over 900 samples
  - ~2/3 were field data, 1/3 were QC
  - 10,000s individual analyses (mostly non-detects)
- Making the data meaningful
  - Detections vs non-detects
  - Location and depth



# Difficulties and Challenges (cont)

- Not all sample locations and depths were predetermined
- File formats and compatibility
  - XMLs are highly structured, so is the software
  - Variances in structure, tags, valid values, etc...
  - File can be unreadable by software



# Difficulties and Challenges (cont)

- Changes in software vendors and availability
  - FUDSChem contract changed October 2015
  - ADR software stopped being supported
  - Required an update in processes





# Improvements and Applications of Best Practices

04.05.2015 09:06



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# Enviro Data

- Create sample labels
- Accepts reviewed SEDDs and A1/A3s
- Link analyses to sample locations
- Dropdown menus for querying
- Create tables for outputs/reports
- Output compatibility with ArcGIS



# Sample Labels

**Soil**

*Offutt Atlas Site 3*

**Lab: CT Laboratories**

**Pres: MeOH, 4°**

**Sample ID: OA3-MW-01-2015-0-0.5**

Location: OA3-MW-01

Filtered: NA

Analyses: 8260c (VOC)

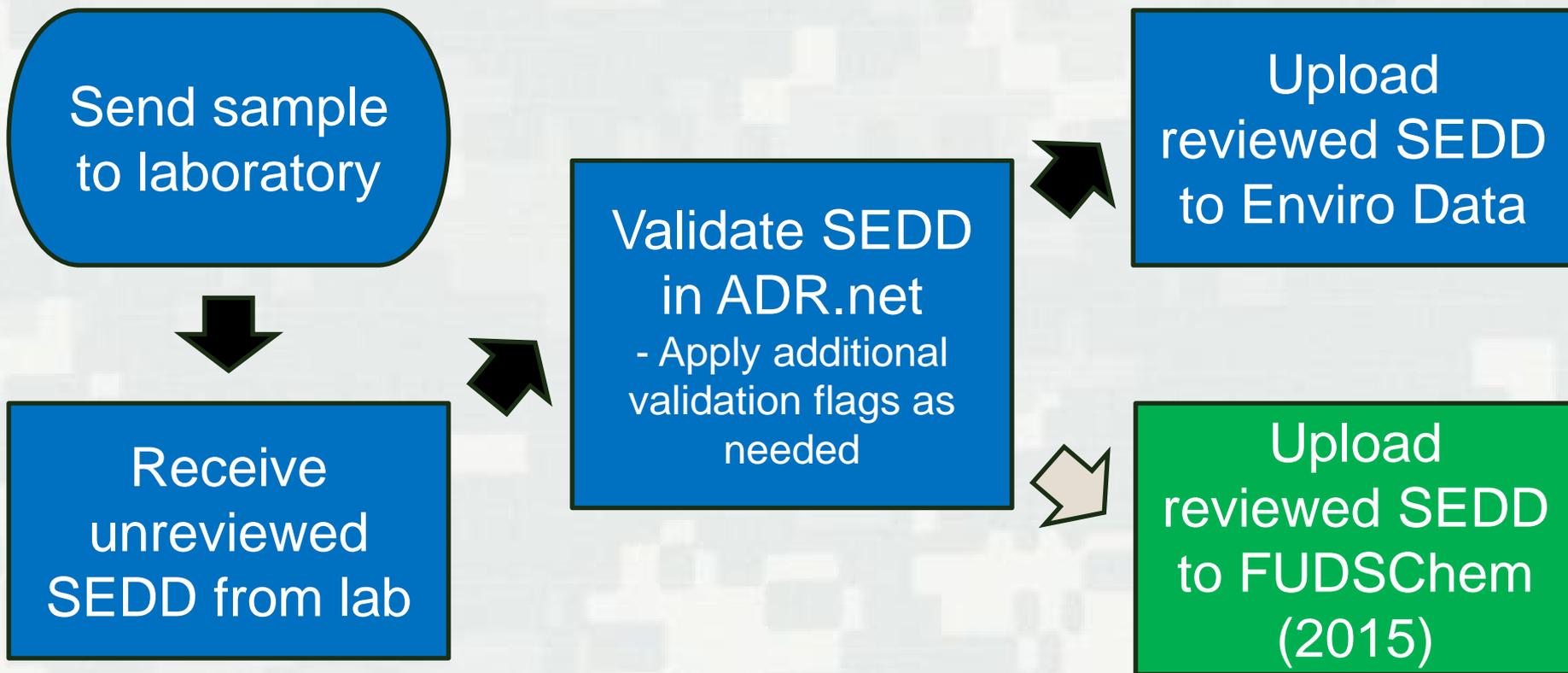
Date: \_\_\_\_\_ Time: \_\_\_\_\_

Sampler: \_\_\_\_\_

Terra Core



# SEDD Delivery Process



# Linking Analyses to Sample Locations

## Import Wizard - Match Station Names

This screen will help you match station names in the import file with those in the database.

Add Station

Add All Stations

Add Alias

Site in Import File	Station in Import File	Change To
▶ USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-2-4	OA3-RP-03
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-2-4MS	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-2-4MSD	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-4-6	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-4-6MS	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-03-2015-4-6MSD	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-04-2015-0-0.5	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-04-2015-2-4	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-04-2015-4-6	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-04-2015-8-10	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-05-2015-8-10	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-06-2015-0-0.5	
USACE Project: OFFUTT ATLAS SITE 3	OA3-RP-06-2015-2-4	

Record: 44 of 71

No Filter

Search

Cancel

< Back

Finish

# Querying

Select Data

Analytic Flags Help    Display Options    Back    Refresh Selected Data    Reset    Clear

<b>Sites</b> Name Offutt Atlas 3 State Type Owner		<b>Samples</b> Sample Group Sample Event Date Top Depth Base Depth Type Purpose Matrix Soil Filtered Geologic Unit Lithology Duplicate Field ID QC Original data; Field duplicates Collect. Agency Task Number Taxonomy Gender Life Stage TissueType Weight Volume Sample Method Samp. Extra 1 Purged		<b>Analyses</b> General    Additional Data    * Display All Results * Parameter Group Parameter Alt Param ID Param Type Lab Value Flags Problems Superseded Value Code Filtered Method Detected? Reportable? Validation Cd j, z QC Batch Sum Category Analysis Group Delivery Grp Extracted? Report. Agency	
---	--	---	--	--	--

Sites     Stations     Samples     Analyses

Station Group    Name OA3-MW-05    Type    Type2    Geologic Unit    Station Status    QC Type    PRP    Enviro. Status    Land Use    Water Use

Location Info.    Regulatory Info.

Update    Number of Analyses: 5     AutoUpdate     Dynamic Filtering

Output    Save/Load    Modify    Other Options

List    Report    Export    Graph    Map    Enviro Space    Close

# Querying Results

List With Groups

Analyses Samples Stations Sites

Station Name	Samp.Date	Parameter	Value	Units	Value/Flag	Fla	Dilution	Analysis Q
OA3-MW-05	5/4/2015	Atrazine	22.5	ug/kg	22.5 J	J		1 Target Com
OA3-MW-05	4/27/2015	Benzaldehyde	44.1	ug/kg	44.1 J	J		1 Target Com
OA3-MW-05	4/27/2015	Naphthalene	55	ug/kg	55	v		1 Target Com
OA3-MW-05	4/27/2015	Trichloroethene	30	ug/kg	30.0 J	J		1 Target Com
OA3-MW-05	4/27/2015	Trichloroethene	14	ug/kg	14 J	J		1 Target Com

Record: 1/1 No Filter Search

Export To Excel Close

# Querying

Select Data

Analytic Flags Help    Display Options    Back    Refresh Selected Data    Reset    Clear

<b>Sites</b> Name Offutt Atlas 3 State Type Owner		<b>Samples</b> Sample Group Sample Event Date Top Depth Base Depth Type Purpose Matrix Soil Filtered Geologic Unit Lithology Duplicate Field ID QC Original data; Field duplicates Collect. Agency Task Number Taxonomy Gender Life Stage TissueType Weight Volume Sample Method Samp. Extra 1 Purged		<b>Analyses</b> General    Additional Data    * Display All Results * Parameter Group Parameter Alt Param ID Param Type Lab Value Flags Problems Superseded Value Code Filtered Method Detected? Reportable? Validation Cd j, z QC Batch Sum Category Analysis Group Delivery Grp Extracted? Report. Agency	
---	--	---	--	--	--

Stations  
 General    Location Info.    Regulatory Info.  
 Station Group  
 Name OA3-MW-05  
 Type  
 Type2  
 Geologic Unit  
 Station Status  
 QC Type  
 PRP  
 Enviro. Status  
 Land Use  
 Water Use

Update    Number of Analyses: 5     AutoUpdate     Dynamic Filtering

Output    Save/Load    Modify    Other Options

List    Report    Export    Graph    Map    Enviro Space    Close

# Output Tables

Sample Location	Field Sample ID	Depth (ft bgs)	Sample Date	Detections	Result (µg/kg)	RSL (µg/kg)
OA3-MW-01	OA3-MW-01-2015-0-0.5	0-0.5	06/03/2015	Benzaldehyde	202 J	780000
OA3-MW-01	OA3-MW-101-2015-0-0.5	0-0.5	06/03/2015	Benzaldehyde	76.7 J	780000
OA3-MW-01	OA3-MW-101-2015-0-0.5	0-0.5	06/03/2015	Acetone	97.7 J	6100000
OA3-MW-01	OA3-MW-01-2015-8-10	8-10	06/03/2015	Trichloroethene	35.3 J	410
OA3-MW-01	OA3-MW-01-2015-23-25	23-25	06/03/2015	bis(2-Ethylhexyl)phthalate	155 J	38000
OA3-MW-01	OA3-MW-01-2015-23-25	23-25	06/03/2015	Trichloroethene	506	410
OA3-MW-01	OA3-MW-01-2015-28-30	28-30	06/03/2015	Acetone	91.7 J	6100000
OA3-MW-01	OA3-MW-01-2015-28-30	28-30	06/03/2015	Dichlorodifluoromethane	16.5 J	8700
OA3-MW-01	OA3-MW-01-2015-28-30	28-30	06/03/2015	Trichloroethene	1070	410
OA3-MW-01	OA3-MW-01-2015-38-40	38-40	06/03/2015	cis-1,2-Dichloroethene	19.5 J	16000
OA3-MW-01	OA3-MW-01-2015-38-40	38-40	06/03/2015	Trichloroethene	14500	410
OA3-MW-01	OA3-MW-01-2015-48-50	48-50	06/03/2015	Trichloroethene	16 J	410
OA3-MW-02	OA3-MW-02-2015-0-0.5	0-0.5	05/27/2015	No Detections	N/A	N/A
OA3-MW-02	OA3-MW-02-2015-8-10	8-10	05/27/2015	No Detections	N/A	N/A
OA3-MW-02	OA3-MW-02-2015-48-50	48-50	05/28/2015	Trichloroethene	50.1 J	410
OA3-MW-02	OA3-MW-02-2015-88-90	88-90	05/29/2015	Atrazine	84.1 J	2300
OA3-MW-02	OA3-MW-02-2015-178-180	178-180	06/01/2015	No Detections	N/A	N/A
OA3-MW-03	OA3-MW-03-2015-0-0.5	0-0.5	06/06/2015	No Detections	N/A	N/A
OA3-MW-03	OA3-MW-03-2015-8-10	8-10	06/06/2015	Trichloroethene	34.9 J	410
OA3-MW-03	OA3-MW-103-2015-8-10	8-10	06/06/2015	Trichloroethene	22.5 J	410
OA3-MW-03	OA3-MW-03-2015-18-20	18-20	06/08/2015	Trichloroethene	45.4 J	410
OA3-MW-03	OA3-MW-03-2015-28-30	28-30	06/08/2015	Trichloroethene	29.8 J	410
OA3-MW-03	OA3-MW-03-2015-33-35	33-35	06/08/2015	No Detections	N/A	N/A
OA3-MW-04	OA3-MW-04-2015-0-0.5	0-0.5	06/23/2015	No Detections	N/A	N/A
OA3-MW-04	OA3-MW-04-2015-8-10	8-10	06/23/2015	Trichloroethene	47.3 J	410
OA3-MW-04	OA3-MW-04-2015-58.5-60	58.5-60	06/23/2015	Trichloroethene	11.9 J	410
OA3-MW-04	OA3-MW-04-2015-108.5-110	108.5-110	06/25/2015	No Detections	N/A	N/A
OA3-MW-04	OA3-MW-04-2015-138.5-140	138.5-140	06/25/2015	No Detections	N/A	N/A
OA3-MW-05	OA3-MW-05-2015-0-0.5	0-0.5	04/27/2015	Trichloroethene	14 J	410
OA3-MW-05	OA3-MW-05-2015-8-10	8-10	04/27/2015	Trichloroethene	30 J	410
OA3-MW-05	OA3-MW-05-2015-50-52	50-52	04/29/2015	No Detections	N/A	N/A
OA3-MW-05	OA3-MW-05-2015-102-112	102-112	05/07/2015	No Detections	N/A	N/A
OA3-MW-05	OA3-MW-05-2015-150-152	150-152	05/04/2015	Atrazine	22.5 J	2300

# FUDSChem

- Required database for FUDS projects
- Now managed by Synectics
- Integrated data validation
  - Unreviewed SEDD uploaded directly to site
  - Validated and stored in same program



# FUDSChem (cont)

- SEDD screening to ensure compliance
- Upload by different users
  - Corps, contractors, or laboratory
  - Helps address errors at the source
- Sample planning, progress reports, output tables





# Results Table

USACE, Omaha District (NWO)

Event: RI Sampling, March 2016

Site: Offutt Site 3

Preliminary Data - Subject to Change Prior to Completion of Data Validation

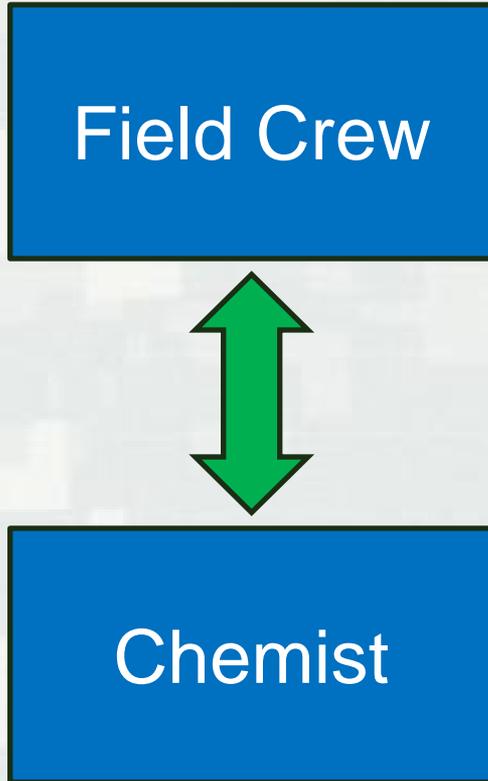
Locations:	SEDD	SEDD	SEDD
Field Sample ID:	OA3-MW-05-2015-150-152	OA3-MW-05-2015-152-157	OA3-MW-05-2015-205-207
Sample Begin Depth:	0.00	0.00	0.00
Sample End Depth:	0.00	0.00	0.00
Sample Date:	05/04/2015	05/04/2015	05/07/2015
4-Methyl-2-pentanone (MIBK) (ug/kg)	530 U	470 U	680 U
4-Nitroaniline (ug/kg)	120 U	140 U	170 U
4-Nitrophenol (ug/kg)	2000 U	2400 U	2900 U
Acenaphthene (ug/kg)	120 U	140 U	170 U
Acenaphthylene (ug/kg)	120 U	140 U	170 U
Acetone (ug/kg)	530 U	85.0	111
Acetophenone (ug/kg)	410 U	480 U	570 U
Aniline (Phenylamine, Aminobenzene) (ug/kg)	120 U	140 U	170 U
Anthracene (ug/kg)	120 U	140 U	170 U
Atrazine (ug/kg)	22.5	140 U	170 U
Benzaldehyde (ug/kg)	120 U	140 U	170 U

# Lessons Learned

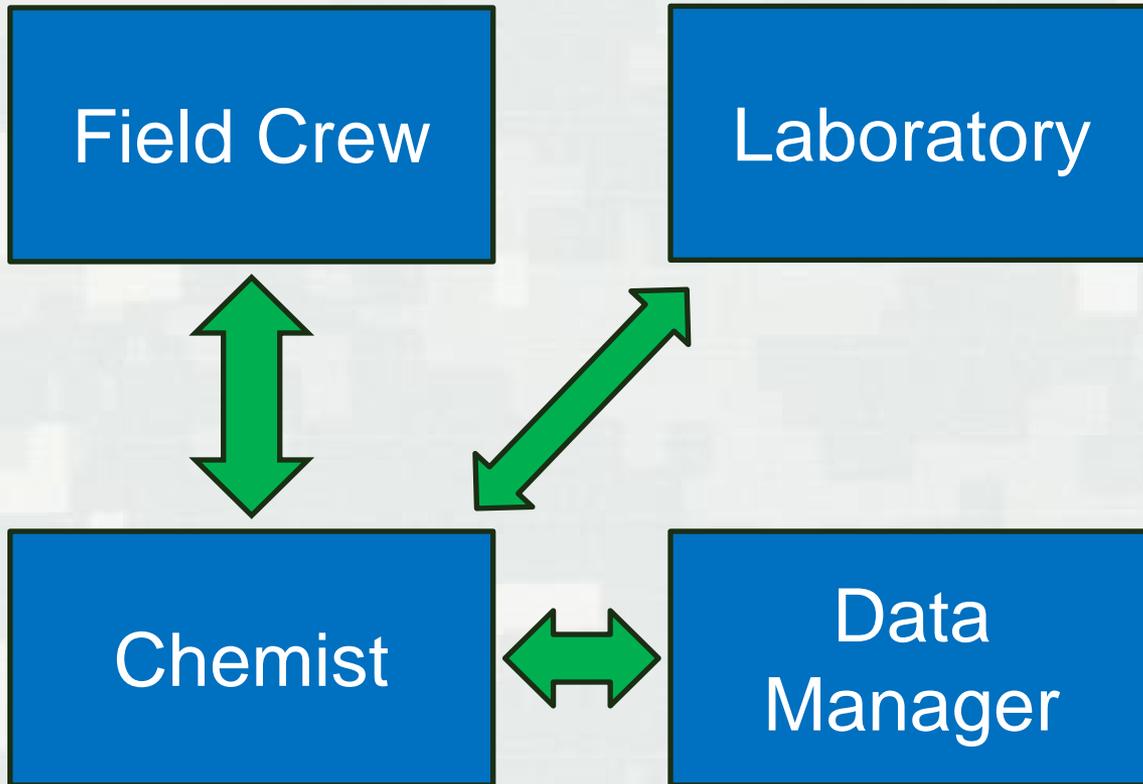
- Stay organized and consistent
  - Consider each step of the process
- Plan ahead as much as possible
- Consider staffing needs
  - Might be too much for project chemist
  - Designate someone if needed



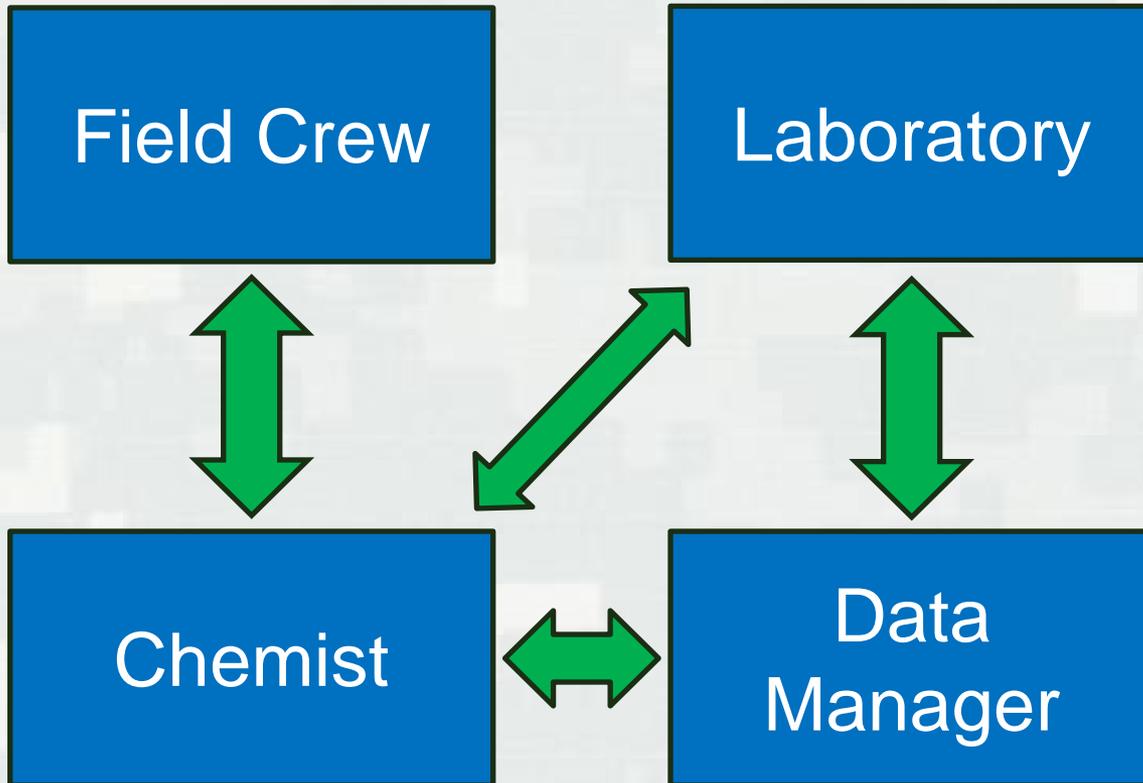
# Communication is Vital



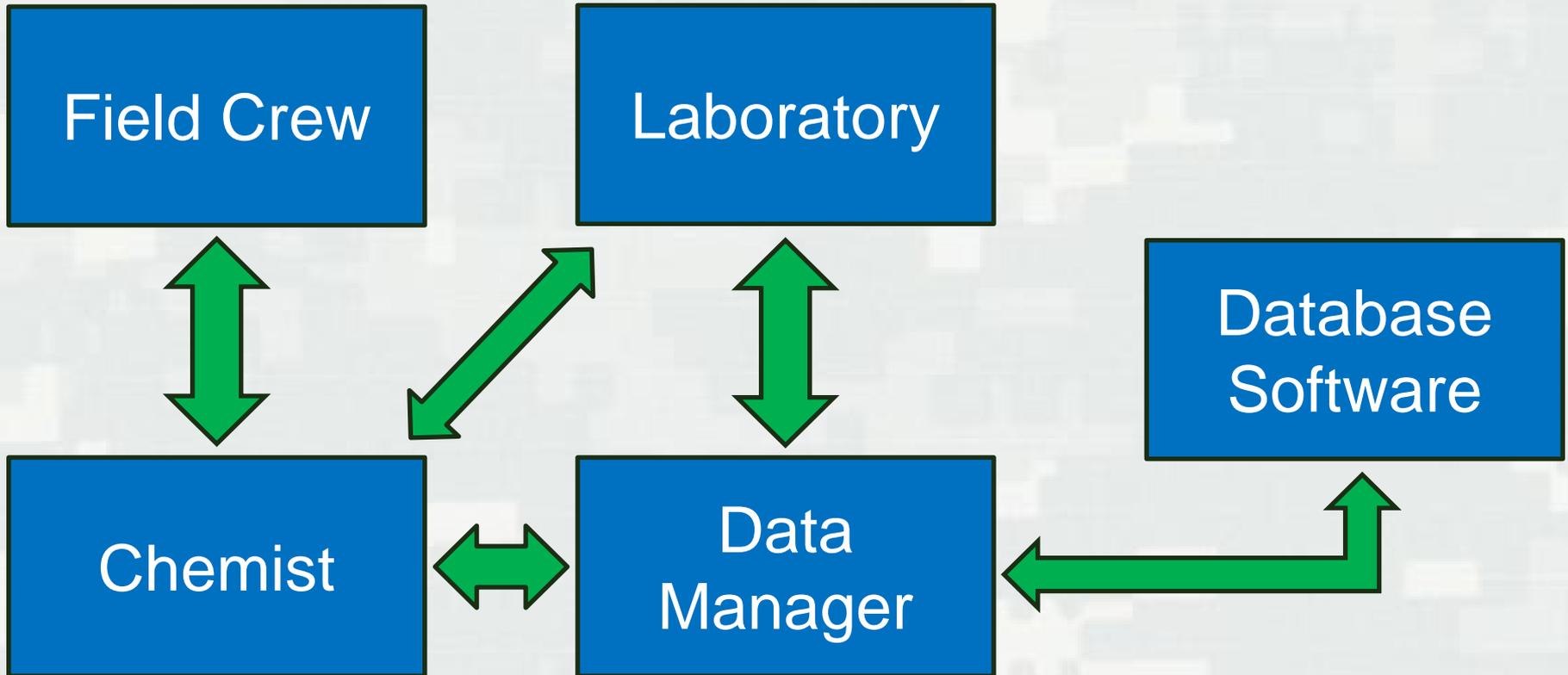
# Communication is Vital



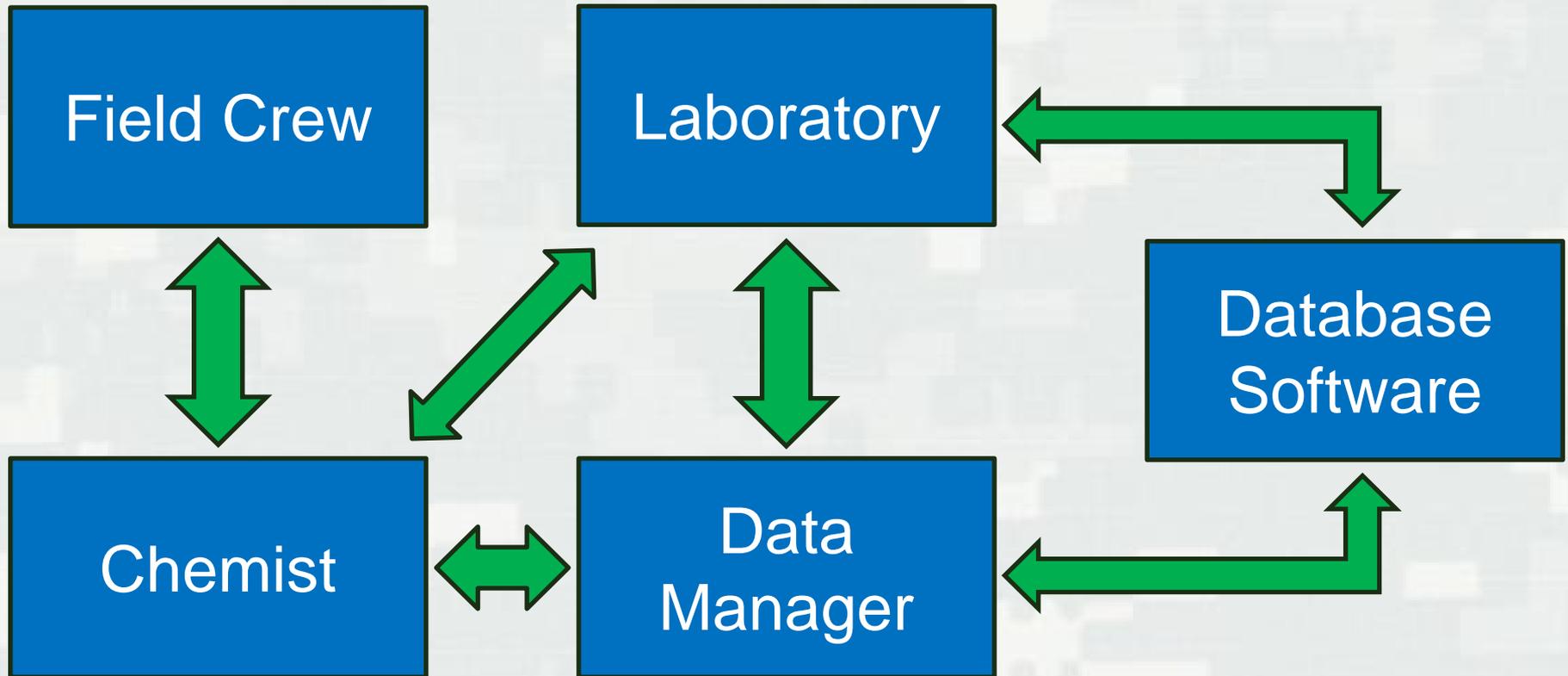
# Communication is Vital



# Communication is Vital



# Communication is Vital



# Questions?



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