



# Dynamic Data Collection

Juggling Multiple Platforms without Sacrificing Standards

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TRCCOMPANIES.COM





# Introduction

## About TRC Companies

- Global consulting, engineering, and management firm
- Nearly 8,000 employees across 150+ offices worldwide
- Over 50 years of industry leadership

## Our Growth Strategy

- Grown through strategic acquisitions
- Brings together diverse workflows, platforms, and teams
- Presents both opportunities and challenges for standardization and integration



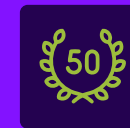
Global Consulting,  
Engineering,  
management



**8,000**  
Employees



**150+**  
Offices



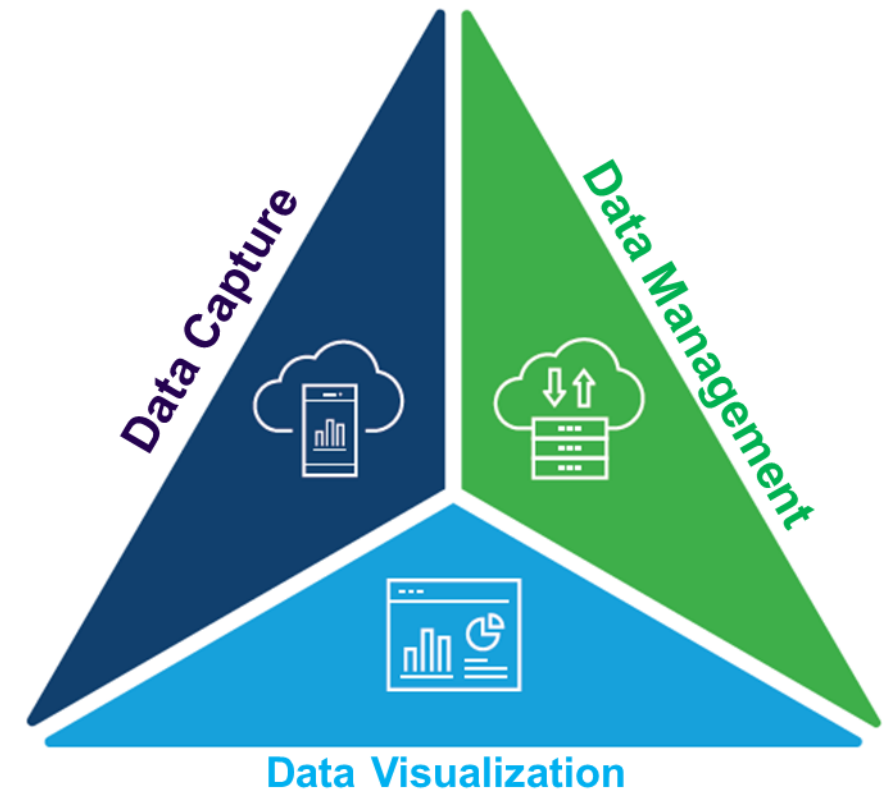
**50+ years**  
Industry Leadership



## TRC's Digital Services

TRC enhances our industry-leading environmental services with Connected EnviroView – a platform of digital solutions to improve **Data Capture**, **Data Management** and **Data Visualization**. With TRC's holistic approach to data, we can provide insights faster for more accurate decision making, improved project and program results, deliverables and ROI.

connected  
+ **enviroview**



**esri**

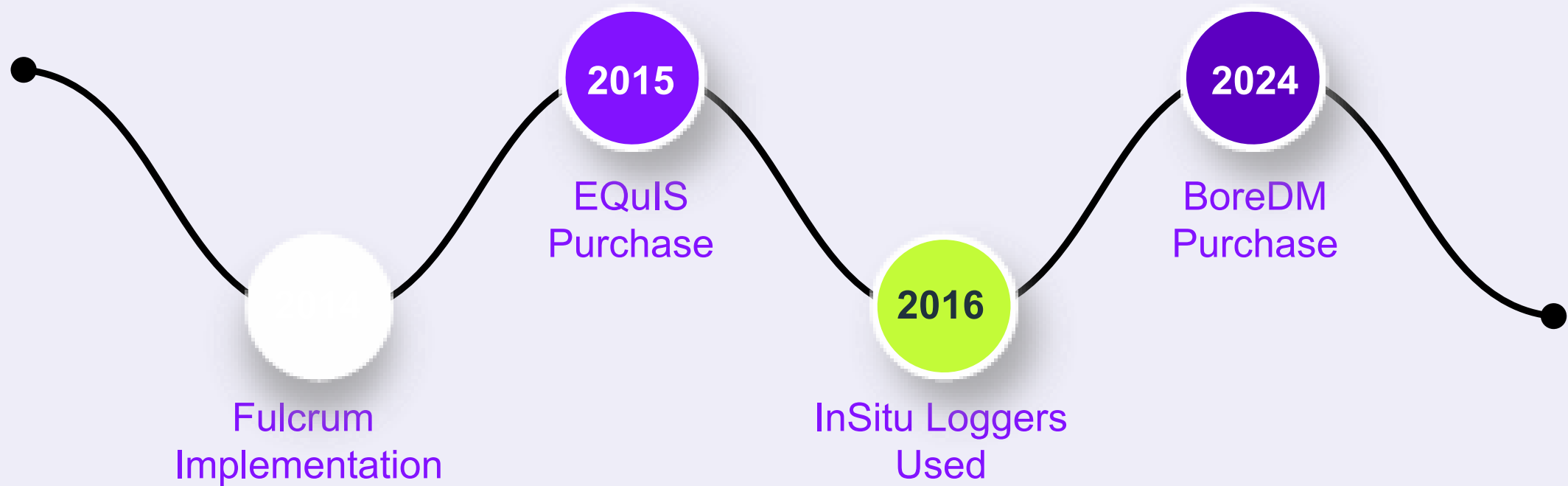
Partner Network  
Silver



**earthsoft**  
Business Partner Program



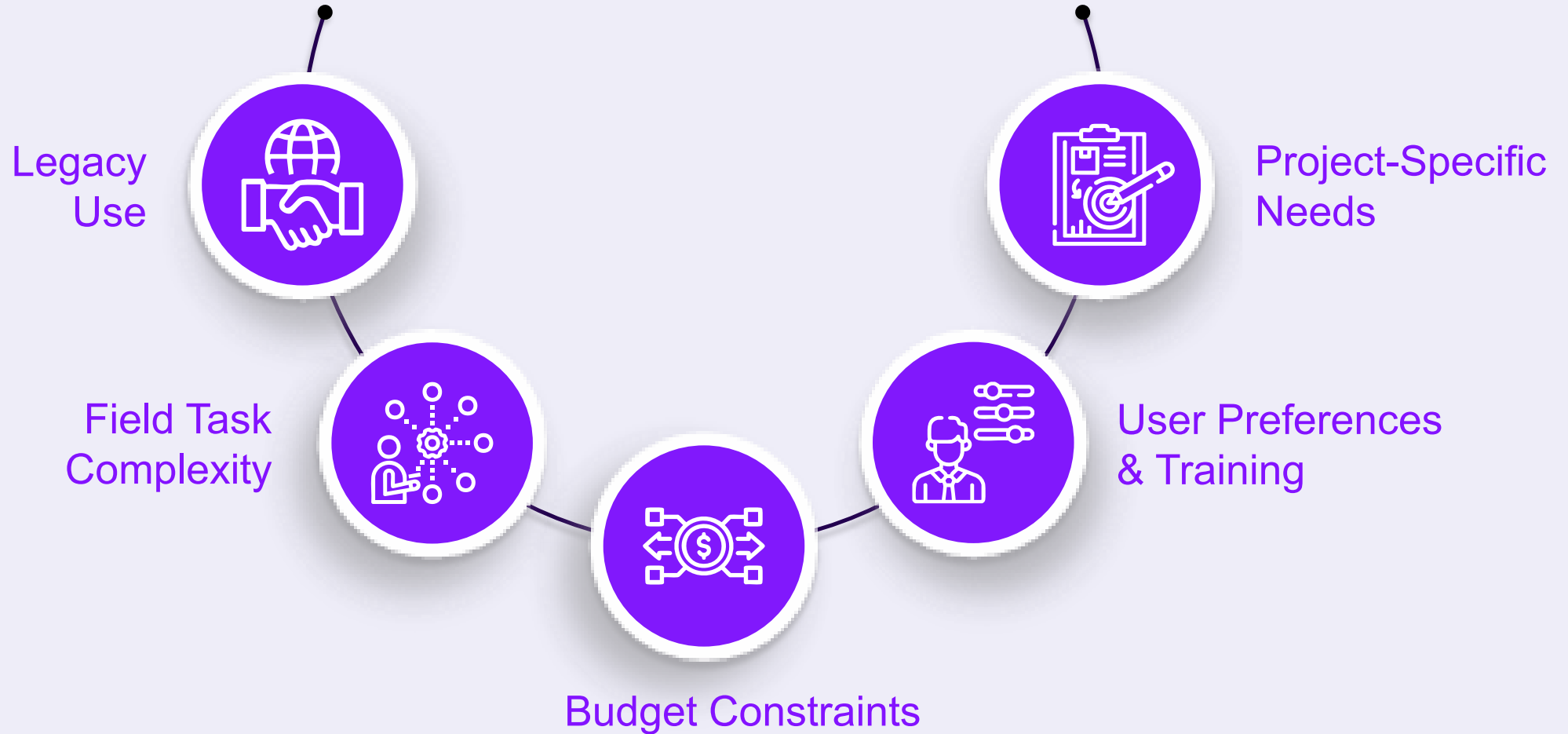
## Mobile Data Collection at TRC



Fulcrum  
Implementation



## Why Multiple Platforms?

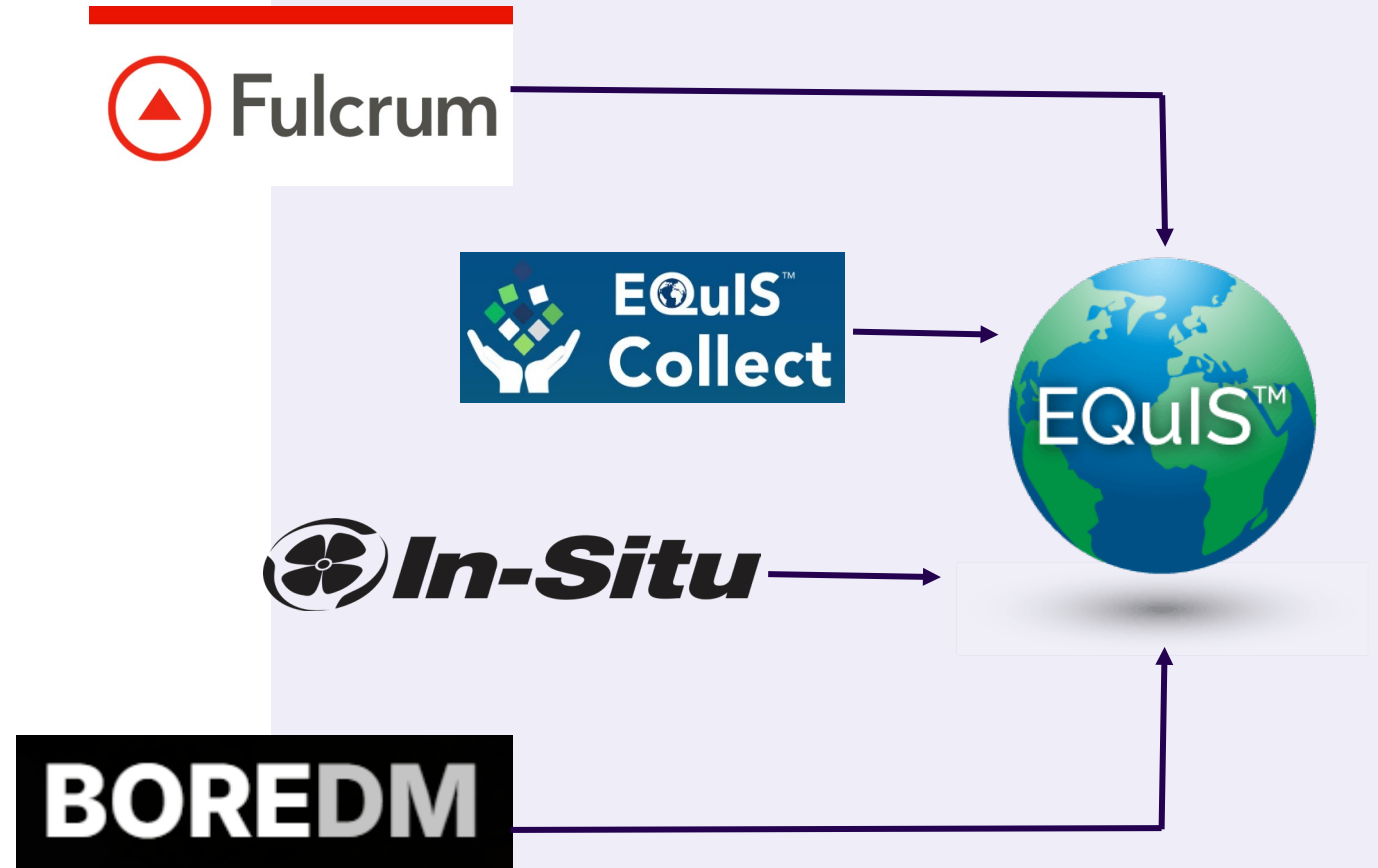




## Balancing Innovation & Control

### Our Goal

Use EQUIS as the central repository to accommodate the use of multiple mobile platforms while maintaining a set of standards and quality.

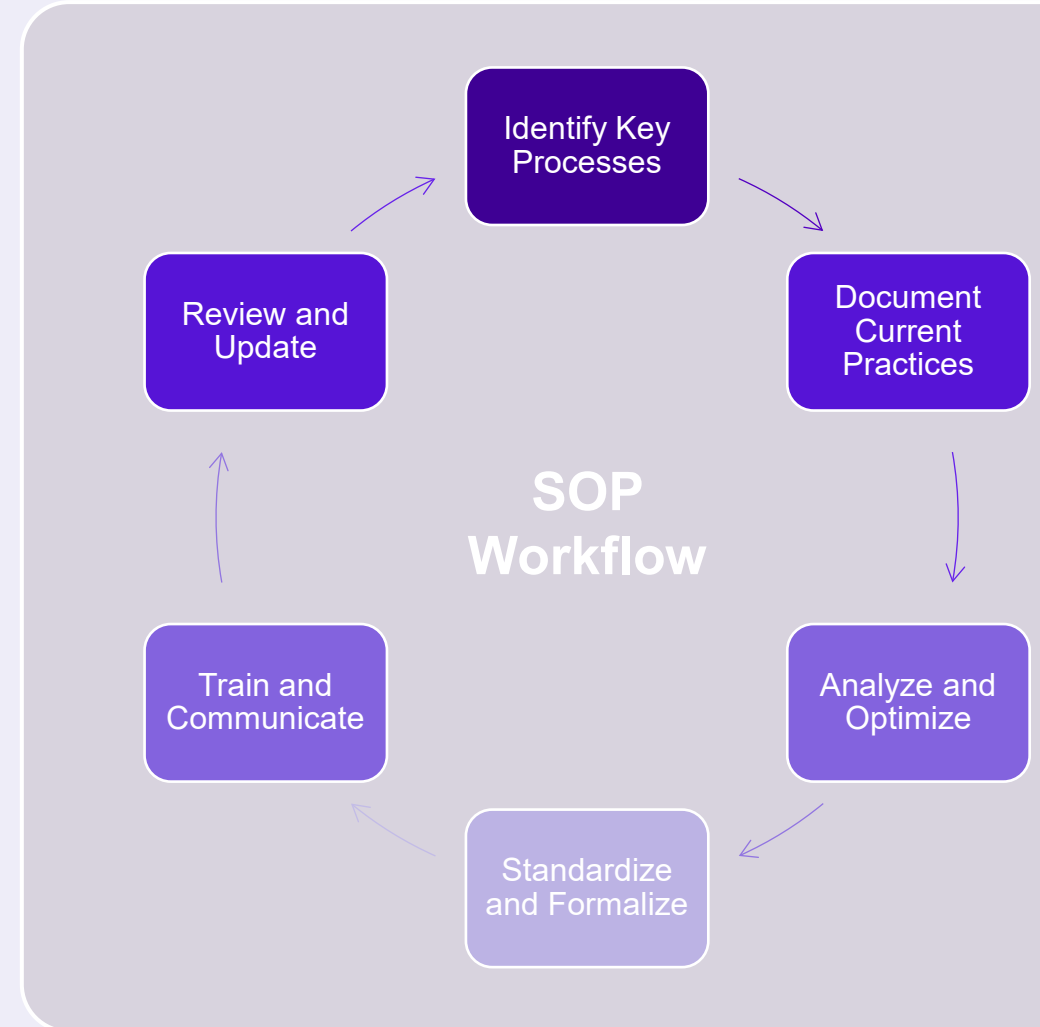




## TRC Standard Operating Procedure (SOP) Workgroup

### Lays the Foundation for Consistency

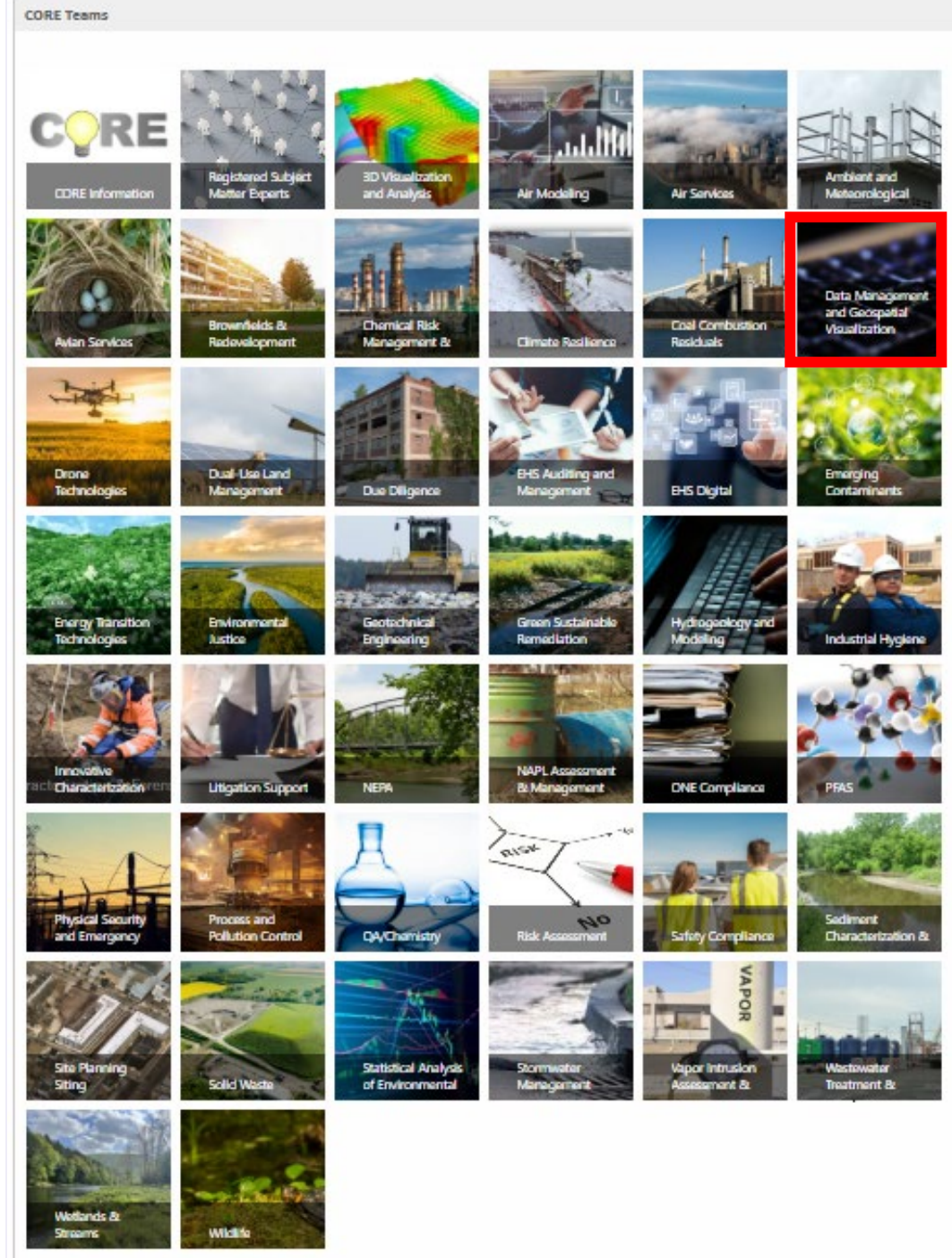
- Develop and maintain corporate **SOPs** that support consistent data collection and field practices across the environmental sector
- SOPs are the baseline for standard field sheets and mobile templates
- Enable seamless collaboration across teams and reduce variability in data collection



# Enabling Standards Through Collaboration

TRC Center of Research & Expertise (CORE) Teams -  
--> Data Management and Geospatial Visualization Team  
-->-->Mobile Data Collection Subgroup

- Develops standard templates based on corporate SOPs
- Supports Fulcrum and EQiS Collect
- Promotes consistency across projects and regions





## How We Standardize Across Platforms

01

Standardized  
Templates

02

Shared  
Reference Values  
Across Platforms

03

Remapping &  
Harmonization

04

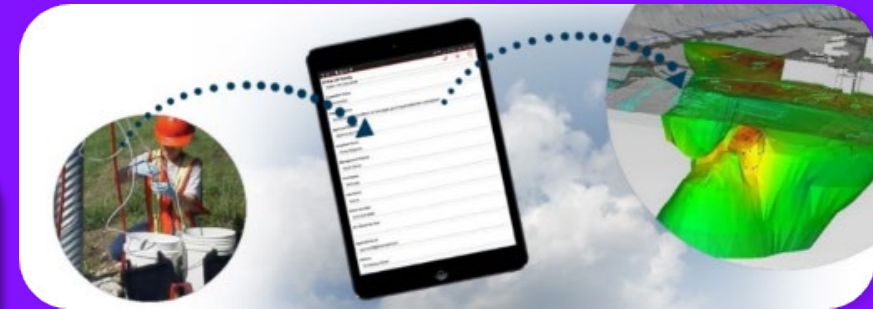
Data Validation  
Through  
Application and  
EDD



# Enabling Standards Through Collaboration continued...

## EQUS Collect

- Standardized Forms Aligned with SOPs
- Real-Time Sync & Collaboration
- Field-to-Office Integration
- Output Format



EQUS Collect 73423498

Template Designer - Parameters

Analytics

Map

Template Designer

Data Forms

User Groups

Reports

**Form**

Form Name \*

Parameters

Description

Field Parameters. Notes: X: Empty required values. Enter a comment.  
✓: Value or Row is stabilized.

Header Field - Requires fields in the form to set \*  
header

Enable Two Column View

GD Related Records

Delete Prohibited

SORT GRID

MAP SETUP LOGGER SETUP

DATA SETS DATA MAPPING

Fields

Table

Add New Field

Time  
Sample Time

3.5 Turbidity  
Turbidity

3.5 pH  
pH

3.5 Temp  
Temperature

3.5 Conductivity  
Conductance

FieldResults\_v1:result\_unit  
Conductivity Unit

3.5 DO  
Dissolved Oxygen

3.5 ORP  
ORP

1A Color  
Color

1A Odor  
Odor

1A Remarks  
Remarks





# Enabling Standards Through Collaboration continued...

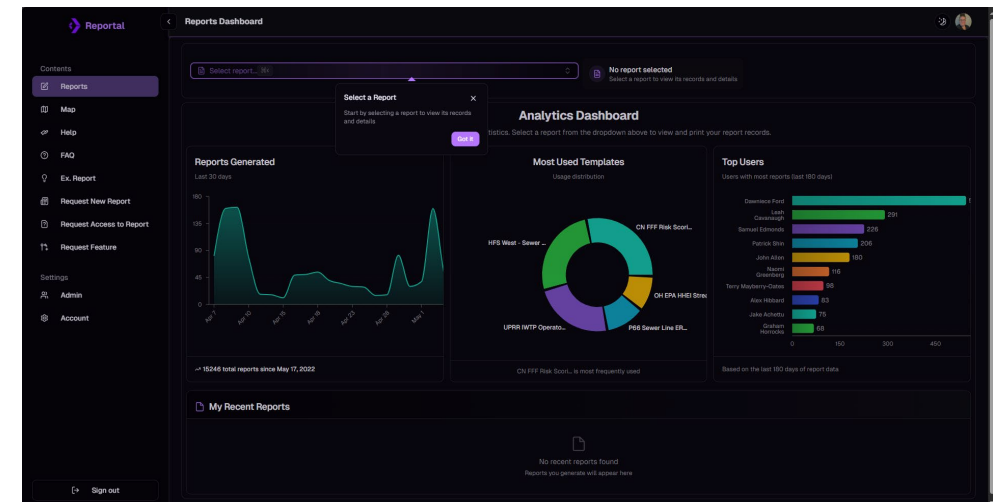
## Fulcrum to EQUIS

### Phase 2: Migrated to RePortal

- Created to streamline field data collection, management, and reporting
- Connects directly with Fulcrum's Application Programming Interface (API) to query and view field data in real time.
- Flexible tools for generating reports
- Collaborate around field data in one place.
- Designed for extensibility




reportal



## In-Situ

- How do we get the In-Situ file information into EQUIS?
- Unable to directly upload the .html files
- Converting to CSV also has issues because of additional logic implemented

 This file can be opened directly in Microsoft Excel (or you can [Export a CSV](#))

**Location Properties**  
Location Name = LTN031J  
Location ID = e2ad810d-5866-43ae-86c9-a84eae84ba99

**Report Properties**  
Start Time = 2024-08-08 10:47:55  
Time Offset = -04:00:00  
Duration = 00:18:36  
Readings = 559

**Instrument Properties**  
Device Model = Aqua TROLL 400  
Device SN = 948252

**Instrument Properties**  
Device Model = Wireless TROLL Com  
Device SN = 945275

Date Time	Depth (m) (834176)	Temperature (°C) (948252)	pH (pH) (21928)	RDO Concentration (mg/L) (945333)	RDO Saturation (%Sat) (945333)
2024-08-08 10:47:55	0.25599933	28.409874	7.800664	8.061381	111.062256
2024-08-08 10:47:57	0.25693655	28.410227	7.802344	8.061608	111.068405
2024-08-08 10:47:59	0.2539409	28.436756	7.816928	8.070737	111.19061
2024-08-08 10:48:01	0.2541885	28.437986	7.8181534	8.071126	111.19697
2024-08-08 10:48:03	0.25443614	28.439217	7.819379	8.071516	111.20332
2024-08-08 10:48:05	0.26389444	28.442228	7.8321657	8.080859	111.336815

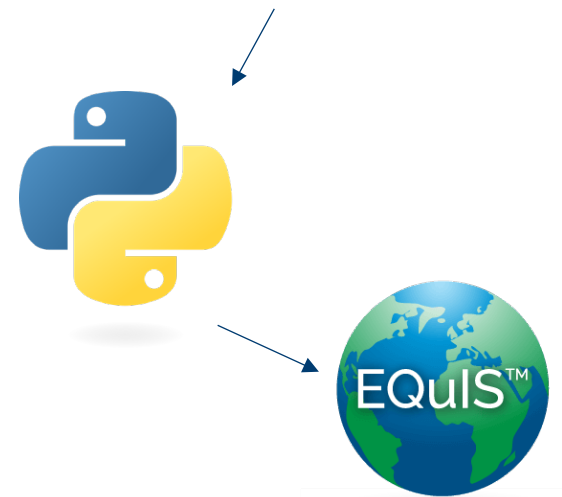




## Transforming In-Situ to EQUIS EDD

Python is:

- Able to read .html files and output .xlsx files
- Coalesce data from different parts of the file
- Allow the user to input additional data
- Apply logic for what data is included and how it is transformed
- Process multiple files at once





## In-Situ User Interface


- The program is compiled to an executable
- Allows the user to select specific files to be processed
- Warning checks developed to alert the user of errors when processing the data

The screenshot shows a Windows-style application window titled "InSitu to EQUIS EDD". The interface includes the following elements:

- Data Provider:** A text input field.
- Task Code:** A text input field.
- Include results without a valid CAS number?:** A checkbox, currently unchecked.
- Sample Delivery Group:** A text input field.
- Duplicate Sample Depth Threshold:** A text input field containing the value "0.0".
- Buttons:** "Insitu Files" and "Output Folder" are positioned below the "Sample Delivery Group" and "Duplicate Sample Depth Threshold" fields, respectively. A "Submit" button is located at the bottom right of the window.



# In-Situ to .CSV

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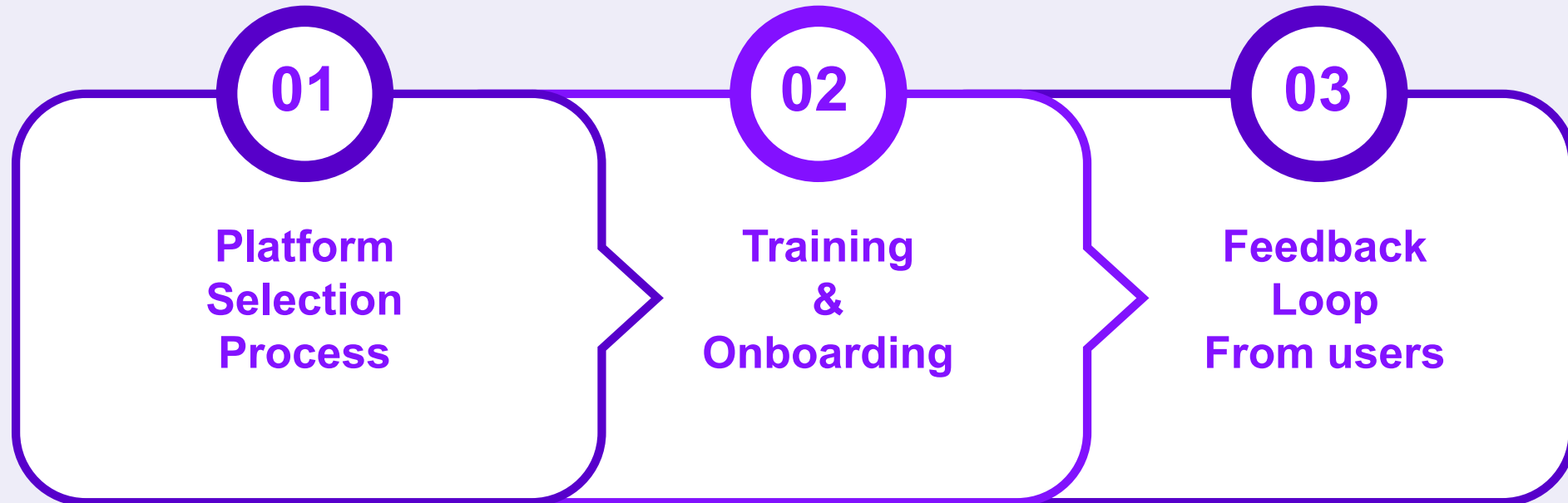
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2024-08-08 10:48:05	0.26389444	28.442228	7.8321657	8.080859	111.336815

sys_loc_code	sys_sample_code	cas_rn	chemical_name	start_depth	end_depth	depth_unit	result_date	result_value	result_unit
LTN031J	LTN031J_202408_1.0	FLD_SALINITY	Salinity	0.98770463		m	2024-08-08 10:50:31	0.009639858	PSU
LTN031J	LTN031J_202408_1.0	FLD_DOSAT	RDO Saturation	0.98770463		m	2024-08-08 10:50:31	111.81254	%
LTN031J	LTN031J_202408_1.0	FLD_COND	Specific Conductivity	0.98770463		m	2024-08-08 10:50:31	23.568796	uS/cm
LTN031J	LTN031J_202408_1.0	FLD_TEMP_AIR	Temperature Air	0.98770463		m	2024-08-08 10:50:31	28.49289	deg C
LTN031J	LTN031J_202408_1.0	FLD_TEMP	Temperature Water	0.98770463		m	2024-08-08 10:50:31	28.577765	deg C
LTN031J	LTN031J_202408_1.0	FLD_BAROM	Barometric Pressure	0.98770463		m	2024-08-08 10:50:31	712.11633	mm Hg
LTN031J	LTN031J_202408_1.0	FLD_PH	pH	0.98770463		m	2024-08-08 10:50:31	8.083167	su
LTN031J	LTN031J_202408_1.0	FLD_DO	RDO Concentration	0.98770463		m	2024-08-08 10:50:31	8.095249	mg/L
LTN031J	LTN031J_202408_3.0	FLD_SALINITY	Salinity	2.9531233		m	2024-08-08 10:52:55	0.009633124	PSU
LTN031J	LTN031J_202408_3.0	FLD_DOSAT	RDO Saturation	2.9531233		m	2024-08-08 10:52:55	112.17802	%
LTN031J	LTN031J_202408_3.0	FLD_COND	Specific Conductivity	2.9531233		m	2024-08-08 10:52:55	23.554277	uS/cm



## Adoption and Implementation





## Challenges and Benefits of Supporting Multiple Data Platforms

### Challenges

- Increased Maintenance Overhead
- Template Version Control
- Communicating Updates
- Data Output Variation

### Benefits

- User Empowerment & Adoption
- Flexibility for Field Conditions
- Improved Data Quality
- Reduced Legal Risk





## Key Takeaways from Our Multi-Platform Data Strategy





# Thanks!



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