Is Your Data Enabling Real-Time Asset Management?

Utility Analytics Summit 2022

Together, Building a Better California

Fela Odeyemi, Ph.D.
Jonathan Glassman, Ph.D., P.E., CRE
Manuj Sharma

Presenters

Fela Odeyemi, Ph.D.

Senior Advising Engineer

Manuj Sharma
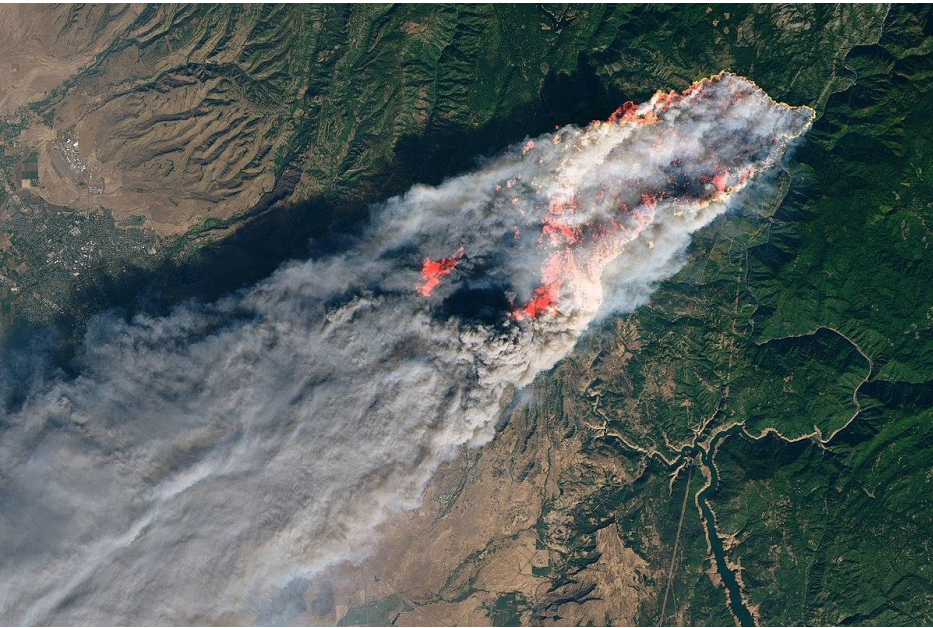
Principal Technical Product Manager

Jonathan Glassman, Ph.D., P.E., CRE

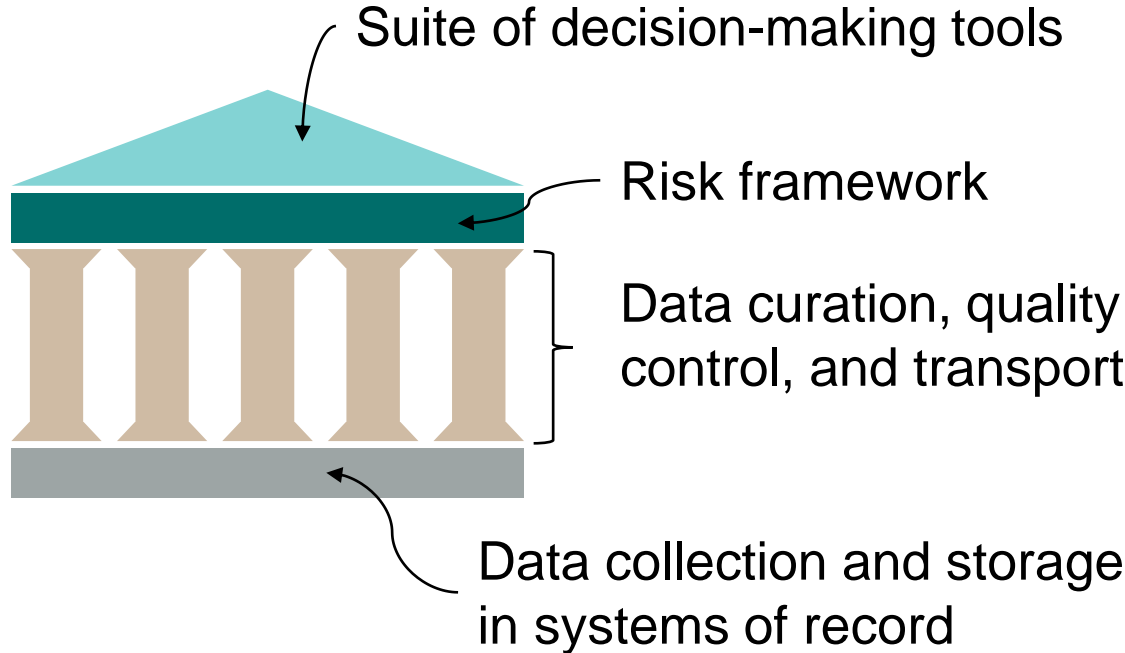Managing Engineer, Data Sciences

Where We Started
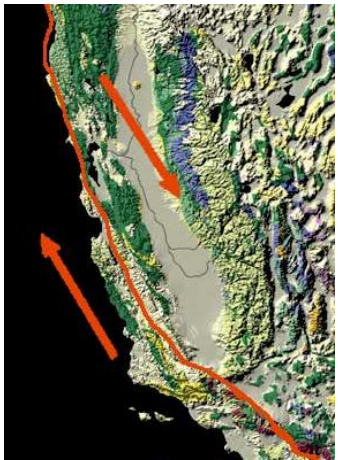
Original motivation

Expansion

. . .

Requirements

(1) Any and all

(2) Daily or on demand

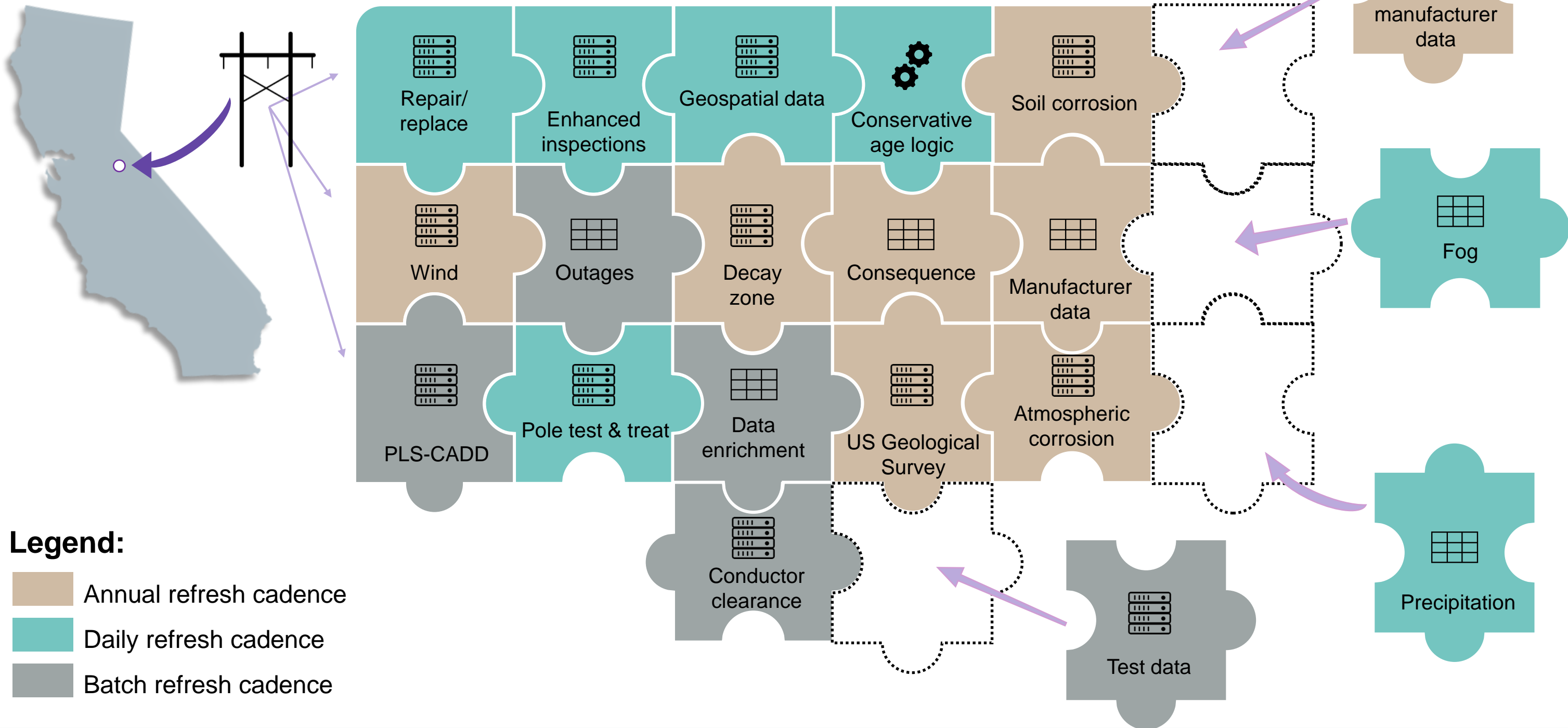(3) Traceability

(4) Measurable

Solution Components

Suite of decision-making tools

Risk framework

Data curation, quality control, and transport

Data collection and storage in systems of record

Data Puzzle

Data Quality

Case I: Age data.
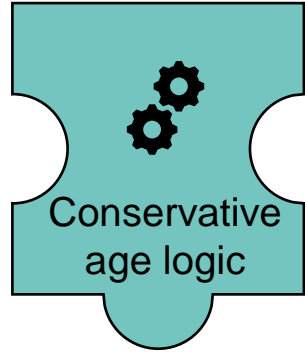
Example:

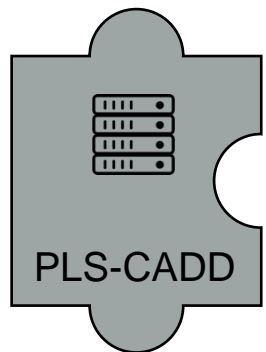Insulator assumed older than before it was used in the system.

Conservative age logic

Case II: Data consistency.

Example:

PLS-CADD

Geospatial data
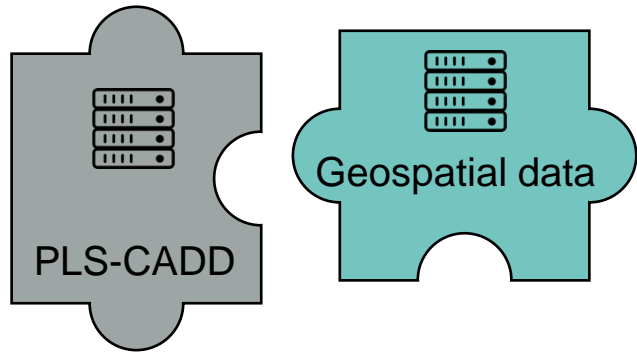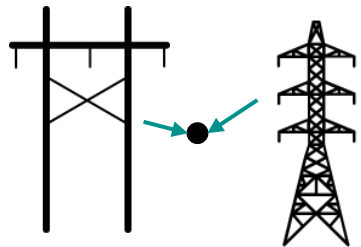
Case III: Clearance penalty.

Example:

Conductor-to-structure clearances < tolerance.
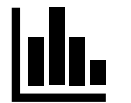
PLS-CADD
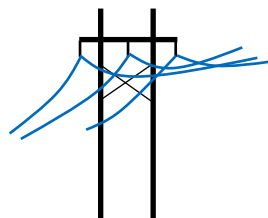
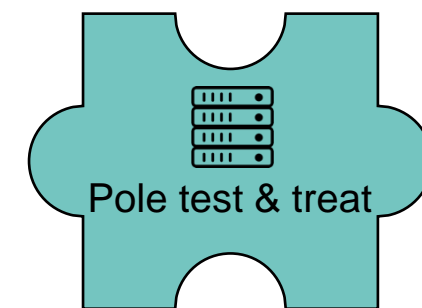**Case V:** Unexpected annual probability of failure (PF) values.

Examples:

(1) PF = 1.0 for a steel structure pole
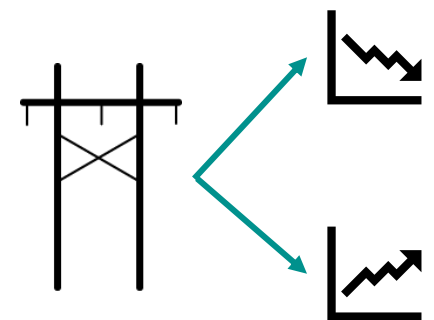
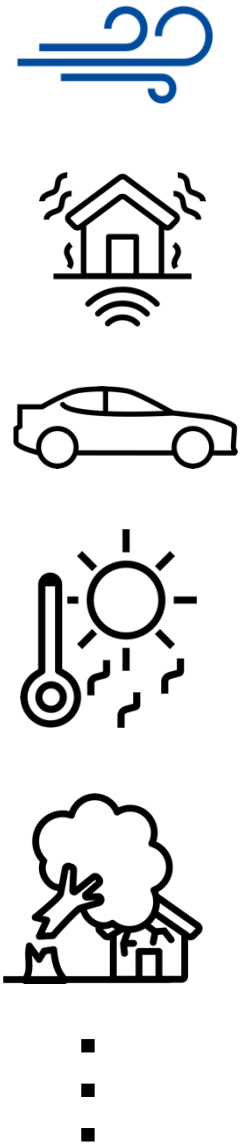(2) PF = 0.88 for a brand new wood pole
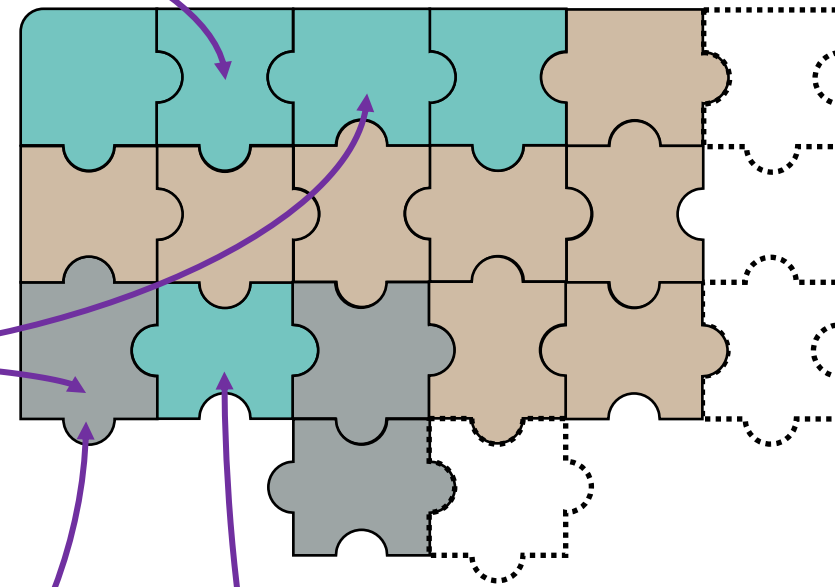
Use data in the risk models

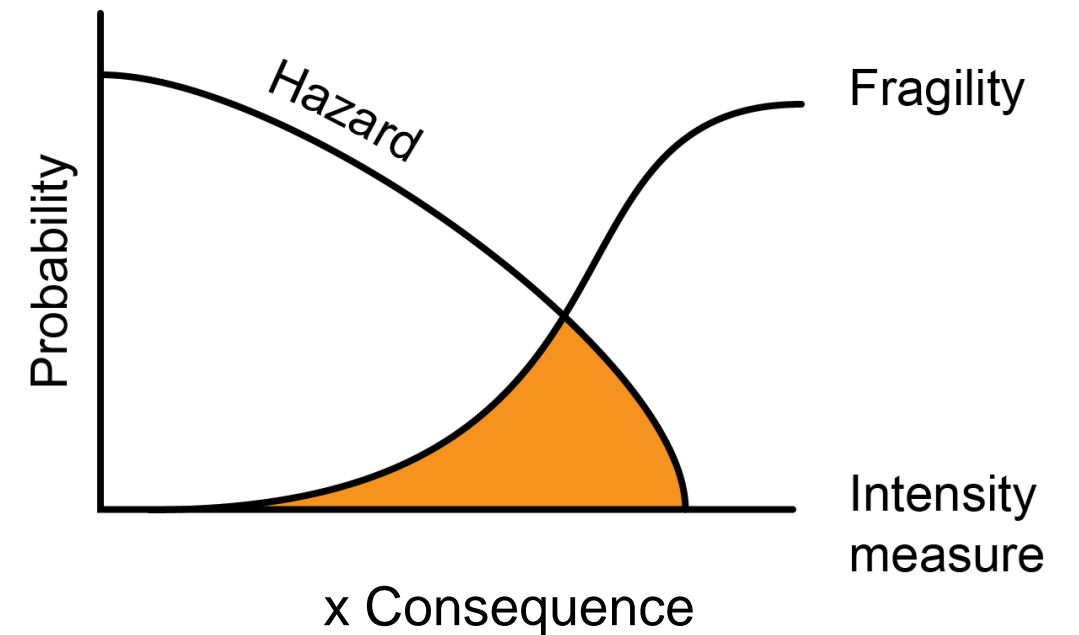**Case IV:** Data anomalies.

Example:

Pole test & treat

Solution Framework
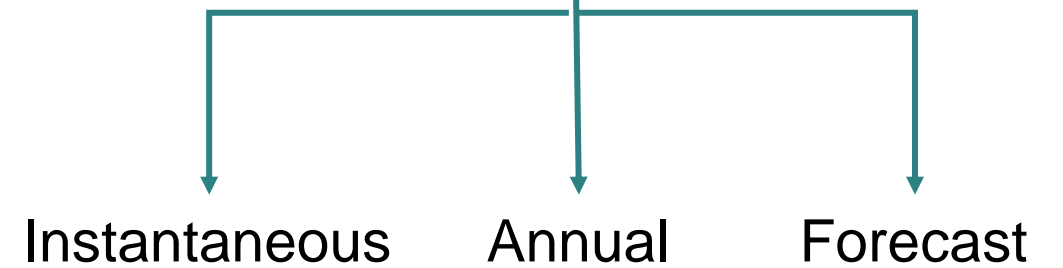

- Atm Corrosion
- Mechanical Wear

- Atm Corrosion
- Contamination

- Atm Corrosion
- Fatigue

- Wood Decay*
- Atm Corrosion

- Soil corrosion

+ Condition scores (0, 1-5)

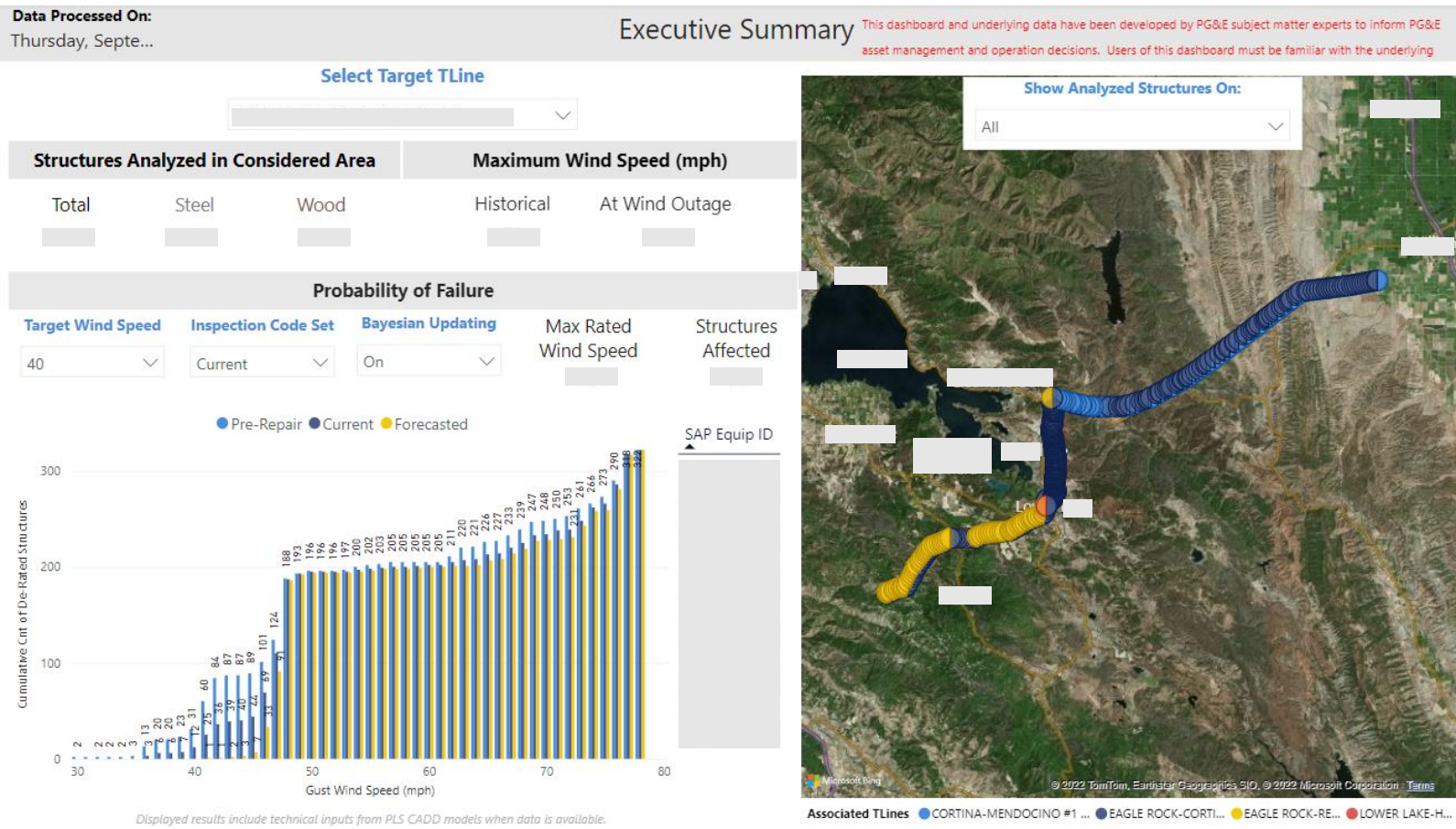+ Maintenance/repair records

+ Numerical modeling

+ Bayesian updating

Probability

Hazard

Fragility

Intensity measure

x Consequence

= Risk

Instantaneous   Annual   Forecast

Common Operating Picture (COP)

- **Operability Assessment ("OA") Dashboard**   - Annual and Forecast ("TCM") Dashboard   - Year-to-Year Analyses
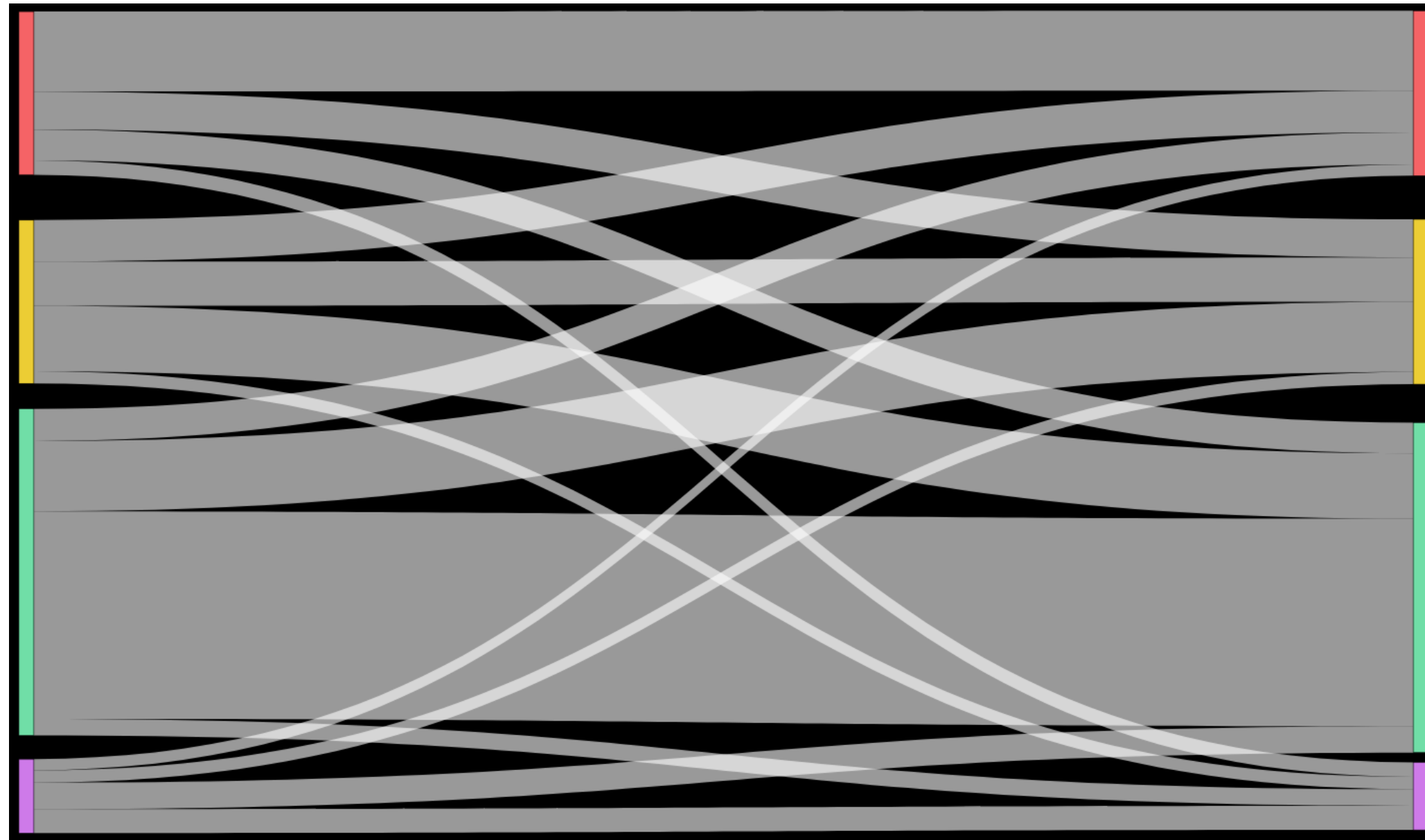
Common Operating Picture (COP)

- Operability Assessment ("OA") Dashboard • Annual and Forecast ("TCM") Dashboard • Year-to-Year Analyses

Common Operating Picture (COP)

-
-
- Year-to-Year Analyses

2021 Risk

Transmission Structures

2022 Risk

Legend
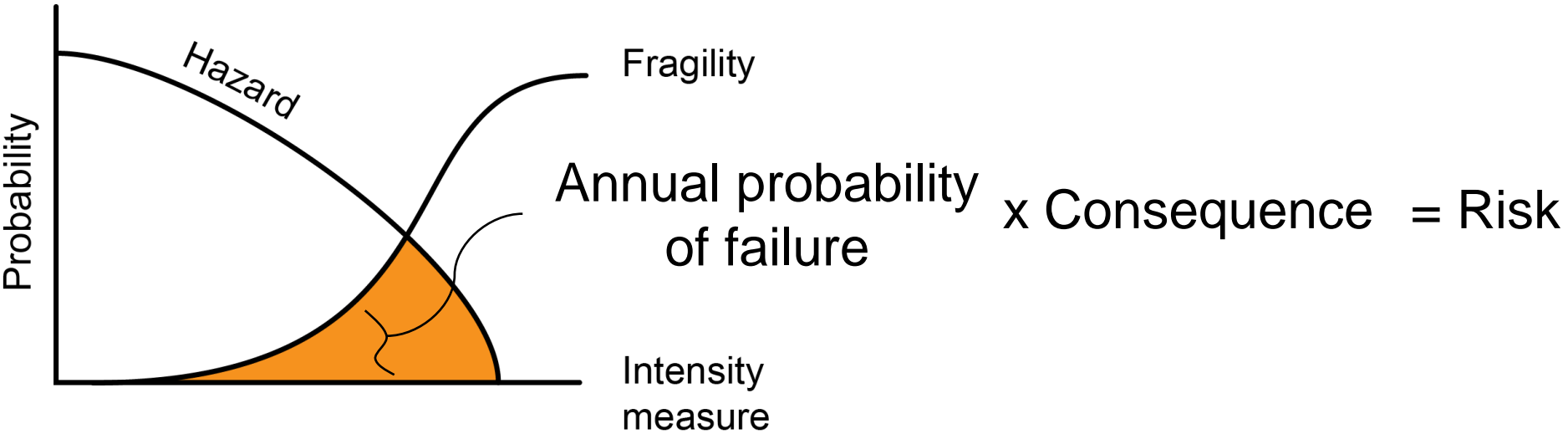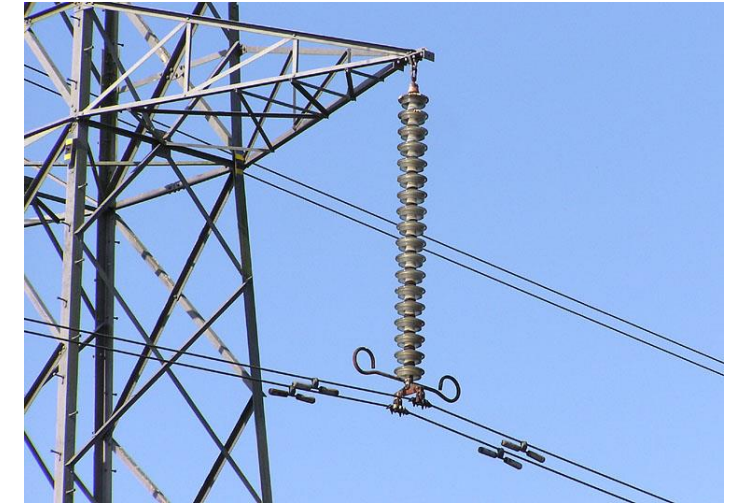
1st quartile risk

2nd quartile risk

Lower half risk

Missing

Illustrative plot

Panel Discussion
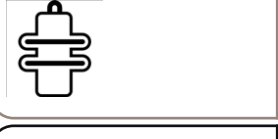
Correlating Models with Field data

Calculate annual probability of failure	Determine consequence	Calculate risk	Risk rank	Quantify additional metrics	Develop targeted programs

Annual probability of failure x Consequence = Risk

Linevue

Threat-Hazard-Risk Framework [Present State]

*More threat and hazard models coming.

	Wind	Seismic	Flashover
Conductor	Atmospheric corrosion Fatigue		
Foundation	Underground corrosion		
Steel structure	Atmospheric corrosion	Atmospheric corrosion	
Wood structure	Wood decay	Wood decay	
Insulator	Atmospheric corrosion		Contamination
Above grade hardware	Atmospheric corrosion Fatigue		
Below grade hardware	Underground corrosion		
Splice	Atmospheric corrosion Fatigue		
Machine learning	Vehicles, balloons, gunshots		

Data Source Confidence
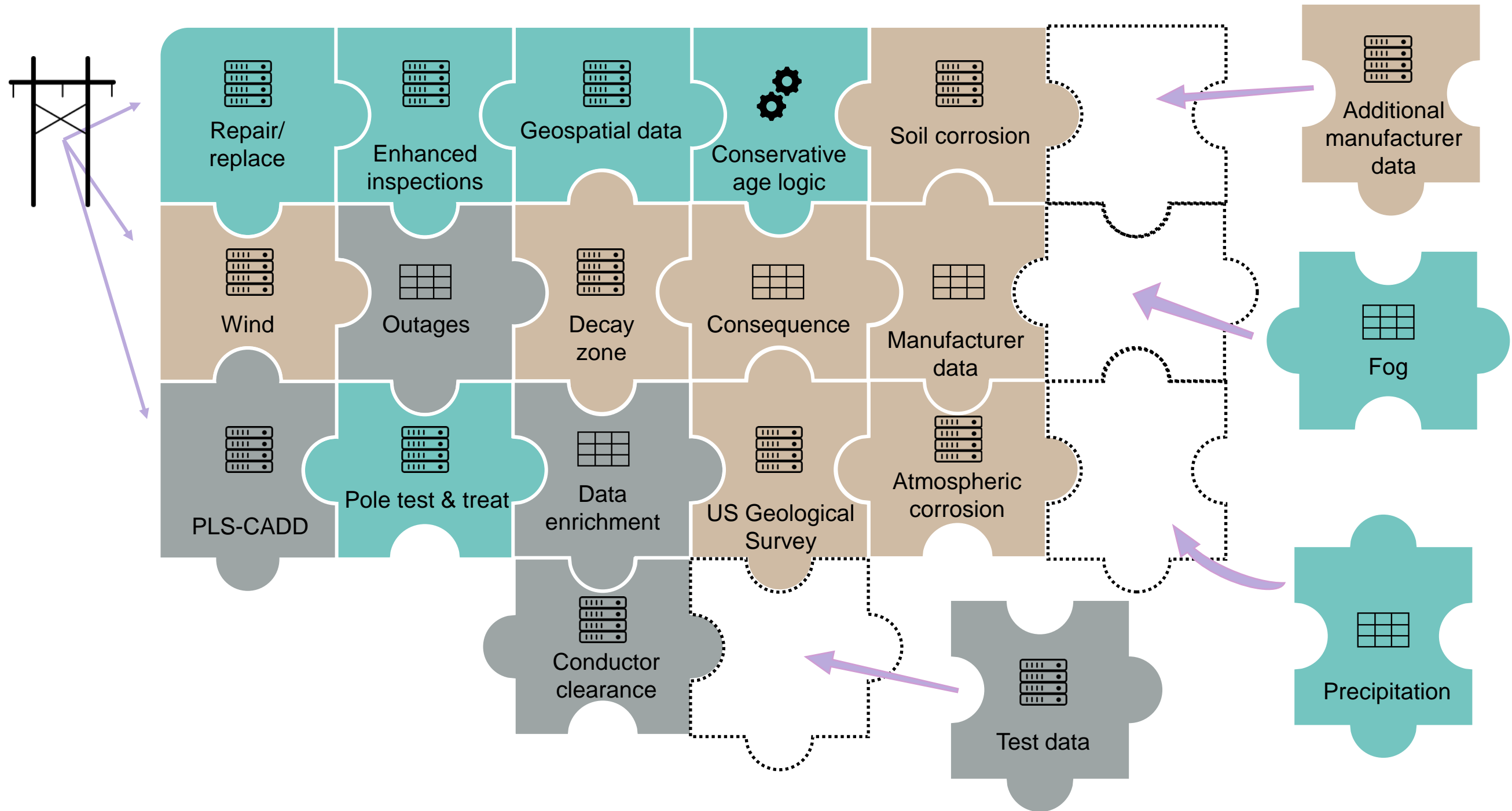
COP Tool and Decision-making
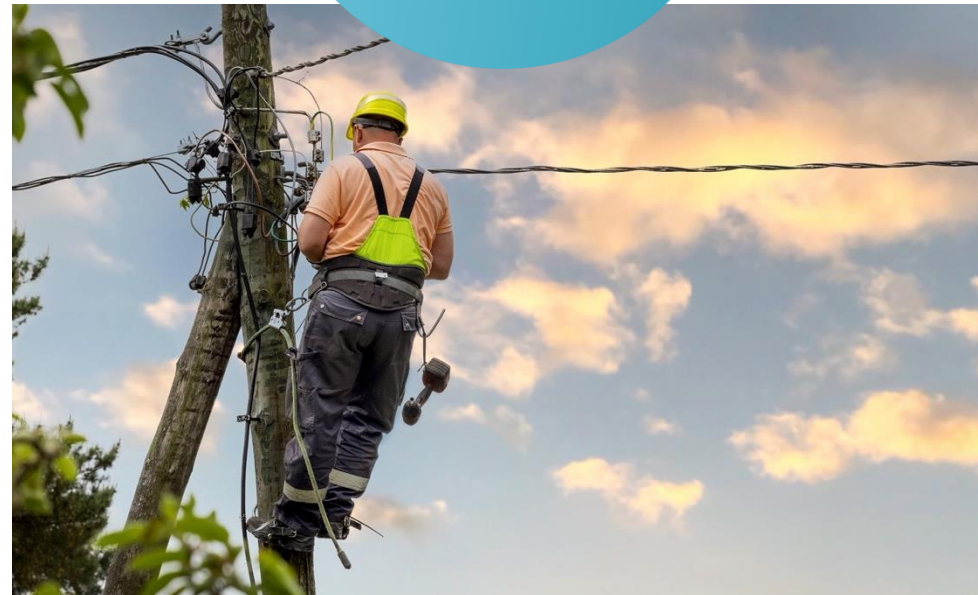
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