



Streamline
Spatial Solutions

Texas Stream Team Water Quality Reporting on Texas Watersheds

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Outline

01

Intro

02

Data

03

Methodology

04

Dashboard
Development

05

Results and
Discussion

06

Conclusion

Introduction



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FOR WATER AND THE ENVIRONMENT

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TEXAS STREAM TEAM

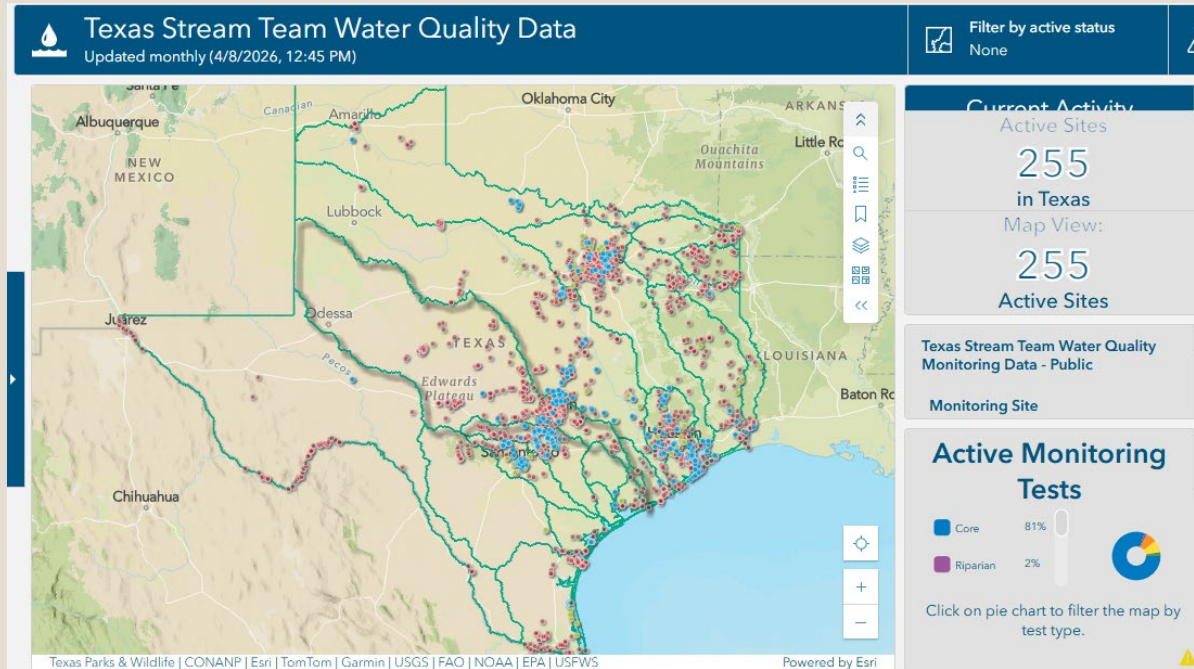
Background

- Our Client: Meadows Center for Water and the Environment
- Uses Texas Stream Team water quality dashboard

Objective

- Create a new ESRI Dashboard
- Containing:
 - Filters
 - Scoring system
 - Summary statistics

Goal



Texas Stream Team dashboard:

Problem: lacks tool to identify watersheds based on reporting criteria.

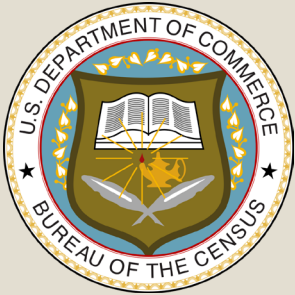
Data



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Client Provided Data

- Site Status Layer
- Water Quality Monitoring Layer
- Watershed Report Tracking Table

Publicly Available Data

- HUC-8 and 10 Watershed boundaries
- River Basin Boundaries
- Texas Counties

Description	Basin	County	Latitude	Longitude	TCEQ Stream Seg...	Sample Date
Galveston Bay @ Sunset C...	San Jacinto-Brazos	Galveston	29.15	-95.03		11/3/25
Tceq Site12067 - Brushy C...	Brazos	Williamson	30.52	-97.67	1244	11/12/25
Rockport Harbor @ Dock 2	San Antonio-Nueces	Aransas	28.02	-97.05	2471OW	11/12/25
Rockport Harbor @ Dock 45	San Antonio-Nueces	Aransas	28.03	-97.05	2471OW	11/12/25
Tceq Site 12676 - Cypress ...	Guadalupe	Hays	30.01	-98.10	1815	11/12/25
Guadalupe River Immedia...	Guadalupe	Comal	29.87	-98.19	1812	11/11/25
Boat Ramp @ Scout Lake	Sulphur	Bowie	33.37	-94.47		11/10/25
Tceq Station 20935 - Ande...	Red	Bowie	33.47	-94.61	0302C	11/10/25
Tceq Site 14237 - Nolan C...	Brazos	Bell	31.06	-97.47	1218	11/10/25
Trinity River Audubon Cen...	Trinity	Dallas	32.70	-96.70	805	11/9/25
Salado Creek @ Austin Hw...	San Antonio	Bexar	29.50	-98.42	1910	11/9/25
Bee Creek Near College S...	Brazos	Brazos	30.60	-96.31		11/7/25
Bee Creek Near College S...	Brazos	Brazos	30.60	-96.31		11/7/25
Cooper Creek @ Burning ...	Trinity	Denton	33.24	-97.10	0823C	11/7/25

Methodology

Data Organization and Procurement

- Data inputs in ArcGIS Pro
- Relationship class establishment

Web Map Publishing and Editing

- Pop-up configuration
- Symbolology and attribute preparation

Arcade Expressions and Scoring

- Implement site eligibility criteria expressions/scoring
- Additional QA flag arcade expressions

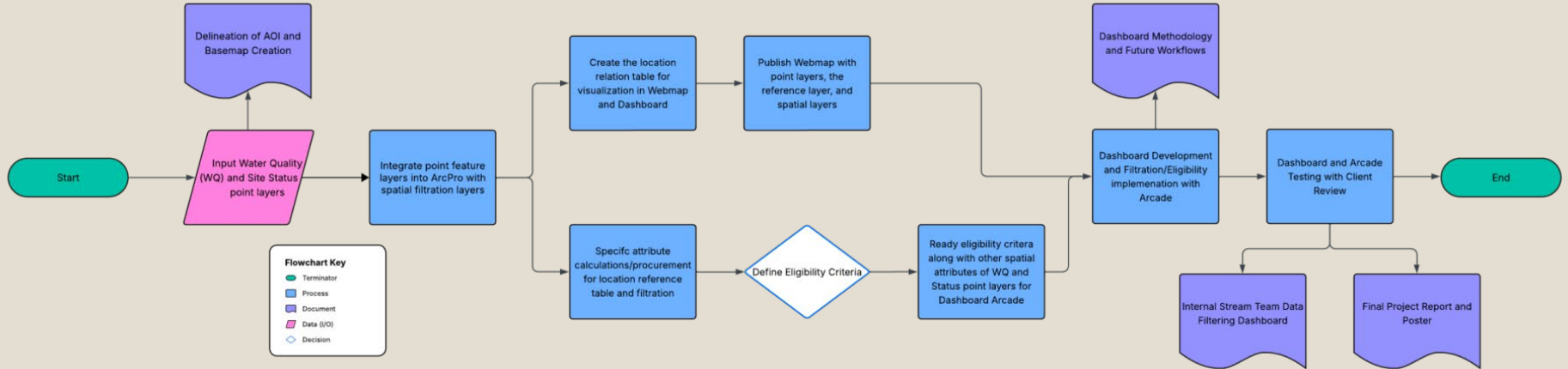
Dashboard Development and Layer Preparation

- ESRI Dashboard filtration implementation
- Watershed eligibility scoring, summary statistics

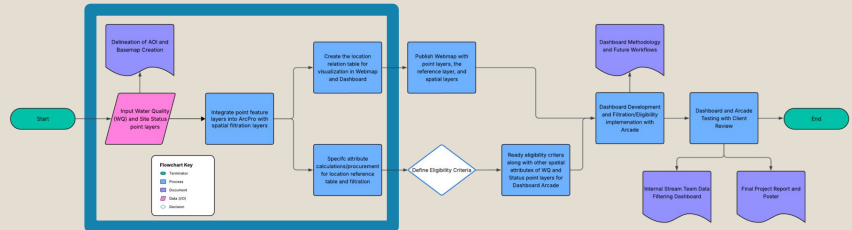
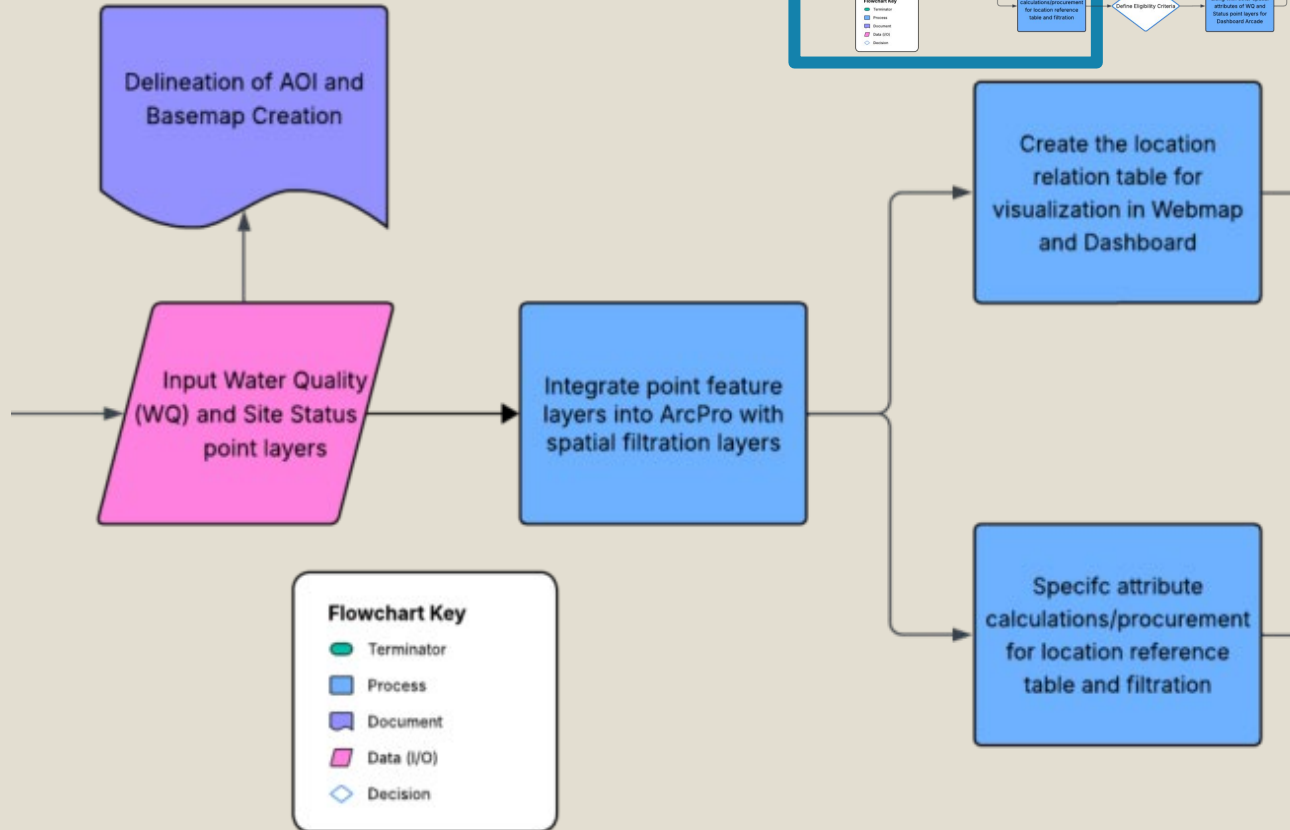
Testing and Validation

- Query and data filtration stress testing
- Future workflows/methodology developed

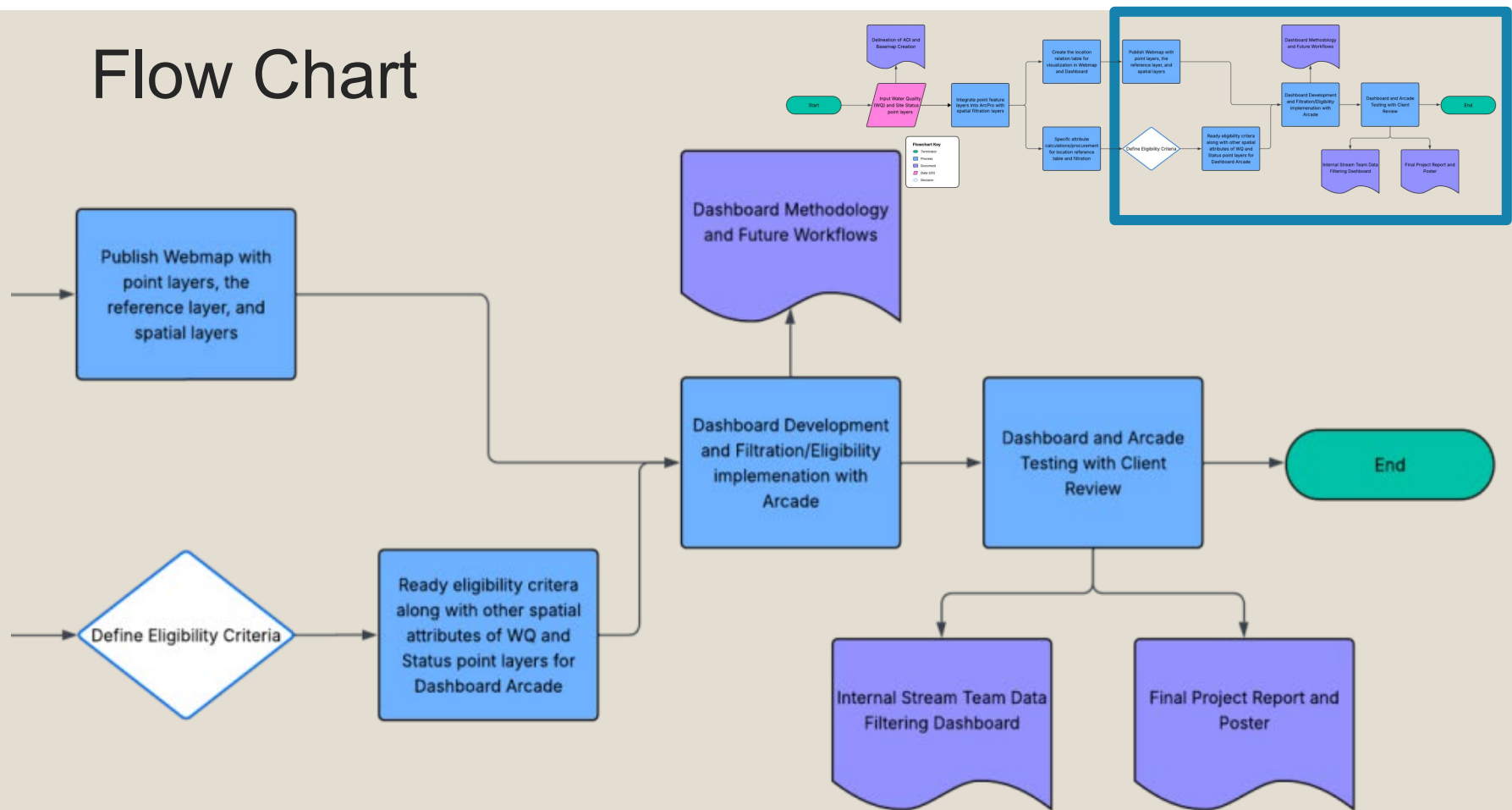
Flow Chart



Flow Chart



Flow Chart



Spatial & Attribute Analysis

Determined Inputs & Outputs

- Active Site Count
- Minimum Amount of Records
- Most Recent Report Year
- Final Score

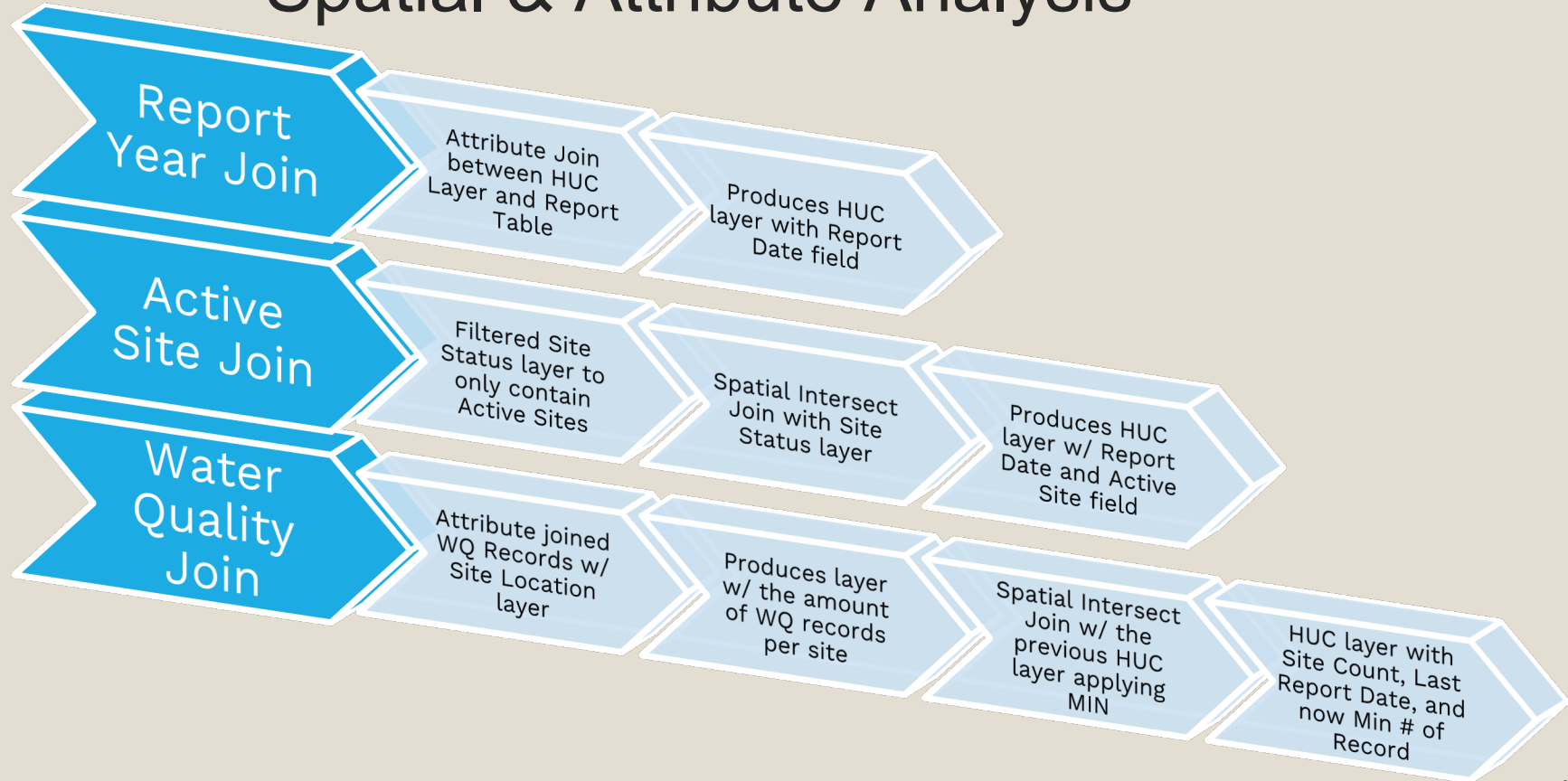
Active Sites ▼ ...
24
19
19

Least Amount of Records
222
162
160

Report Year ▼ ...
2,025
2,024
2,023

score ▲ ...
50.00
70.00
50.00

Spatial & Attribute Analysis



Eligibility Criteria Application

Scoring

- Flexible
- View watersheds nearing eligibility
- Consider watersheds that need more data collection

Weights

- ≥ 3 Active Site Count: 50%, client ranked that most important
- ≥ 10 Record Count: 30%, data critical to reporting
- No Report in ≥ 5 years: 20%, serving as a prioritization factor

Eligibility Criteria Application

```
// site count scoring
if (siteCount >= 3) {
  | score += 50;
} else if (siteCount >= 2){
  | score += 20;
} else {
  | score += 0;
}

//record count scoring
if (recordCount >= 10) {
  | score+= 30
} else if (recordCount >= 7) {
  | score+= 20
} else {
  | score+= 0
}

//report year scoring
if(Year(Now) - reportYear >= 5) {
  | score+= 20
} else if (Year(Now) - reportYear >= 4) {
  | score+= 10
} else {
  | score+= 0
}
```

Scoring - Arcade

- Highest score for criteria that meets or exceeds thresholds, moderate for those just below, and low for those not met
- Outputs to the Score field
- Allows flexible scoring and highlights watersheds nearing eligibility

QC Flag Function

Functionality

- Code scans sample data and flags missing, incomplete, or unrealistic values
- Based on client data validation document
- QC_Flag: Identifies type of issue
- Flag Count: Total number of issues per sample

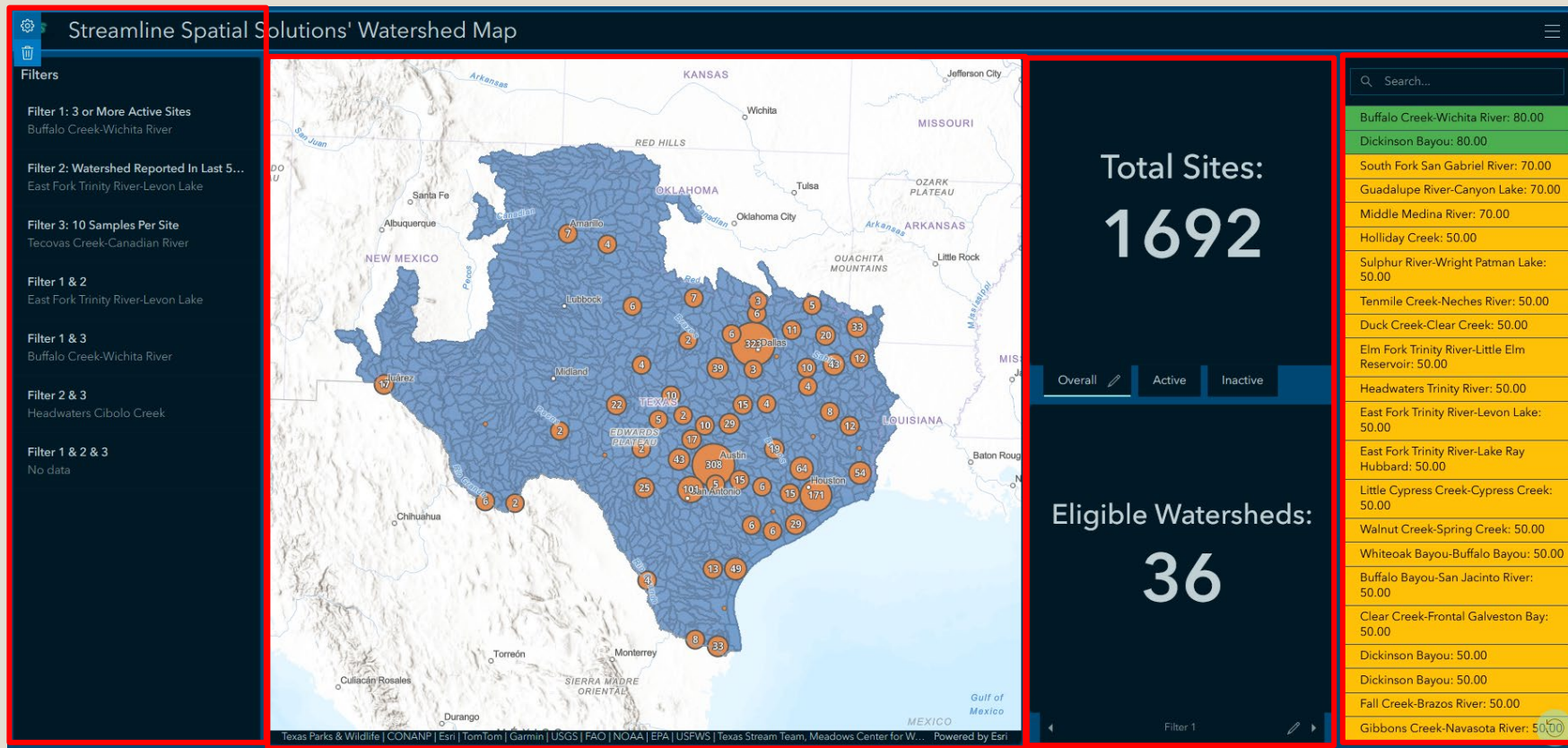
QC_Flag	Flag Count
OK	0
OK	0
Missing DO, Missing Depth, Missing pH	3
OK	0
Missing pH	1

```
// Zero depth review
if (!IsEmpty(sampleDepth) && sampleDepth == 0) {
    if (issues != "") {
        issues += ", ";
    }
    issues += "Zero Depth Review";
    count += 1;
}

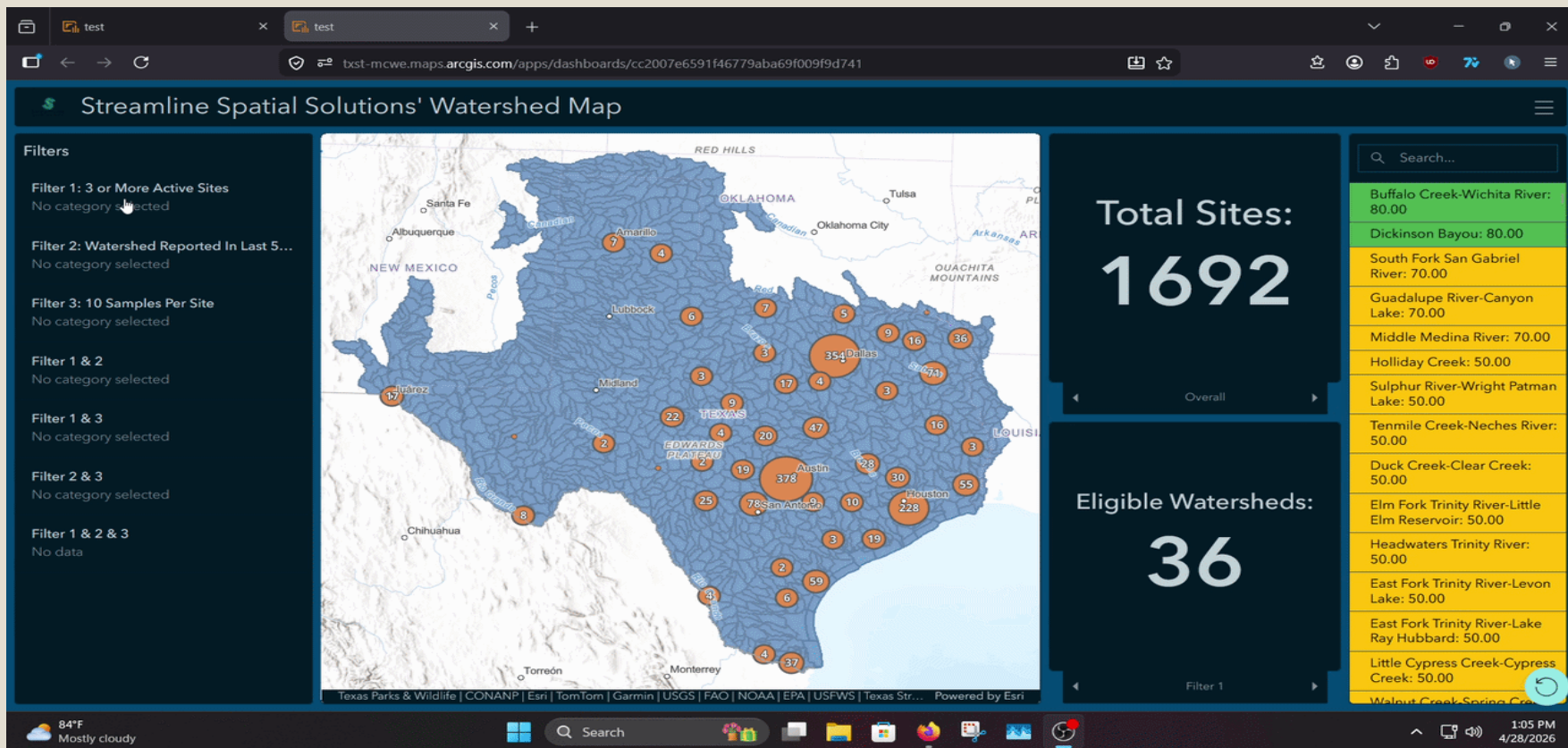
// County check
if (IsEmpty(county)) {
    if (issues != "") {
        issues += ", ";
    }
    issues += "Missing County";
    count += 1;
}

// pH check
if (IsEmpty(pHVal)) {
    if (issues != "") {
        issues += ", ";
    }
    issues += "Missing pH";
    count += 1;
}
```

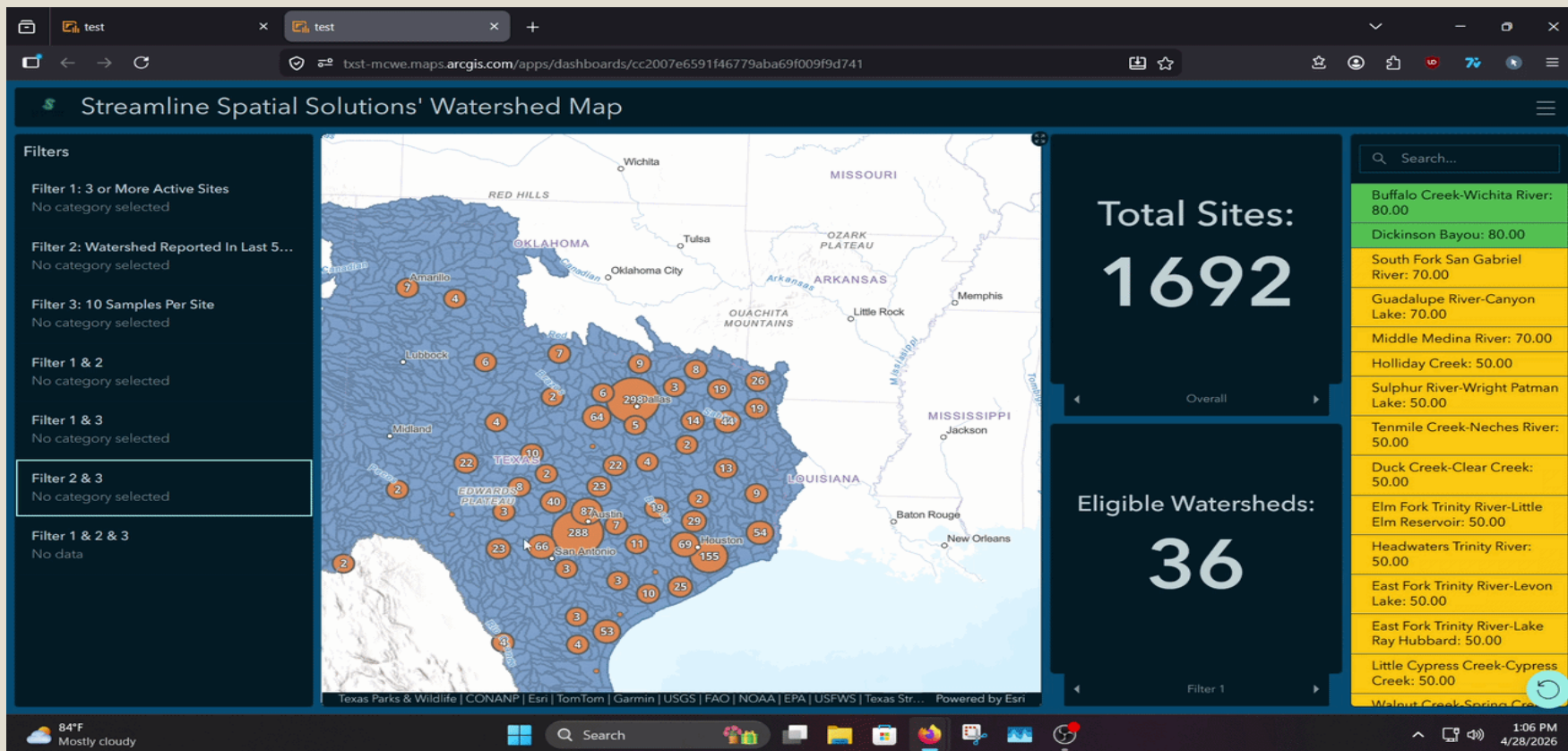
Completed Dashboard



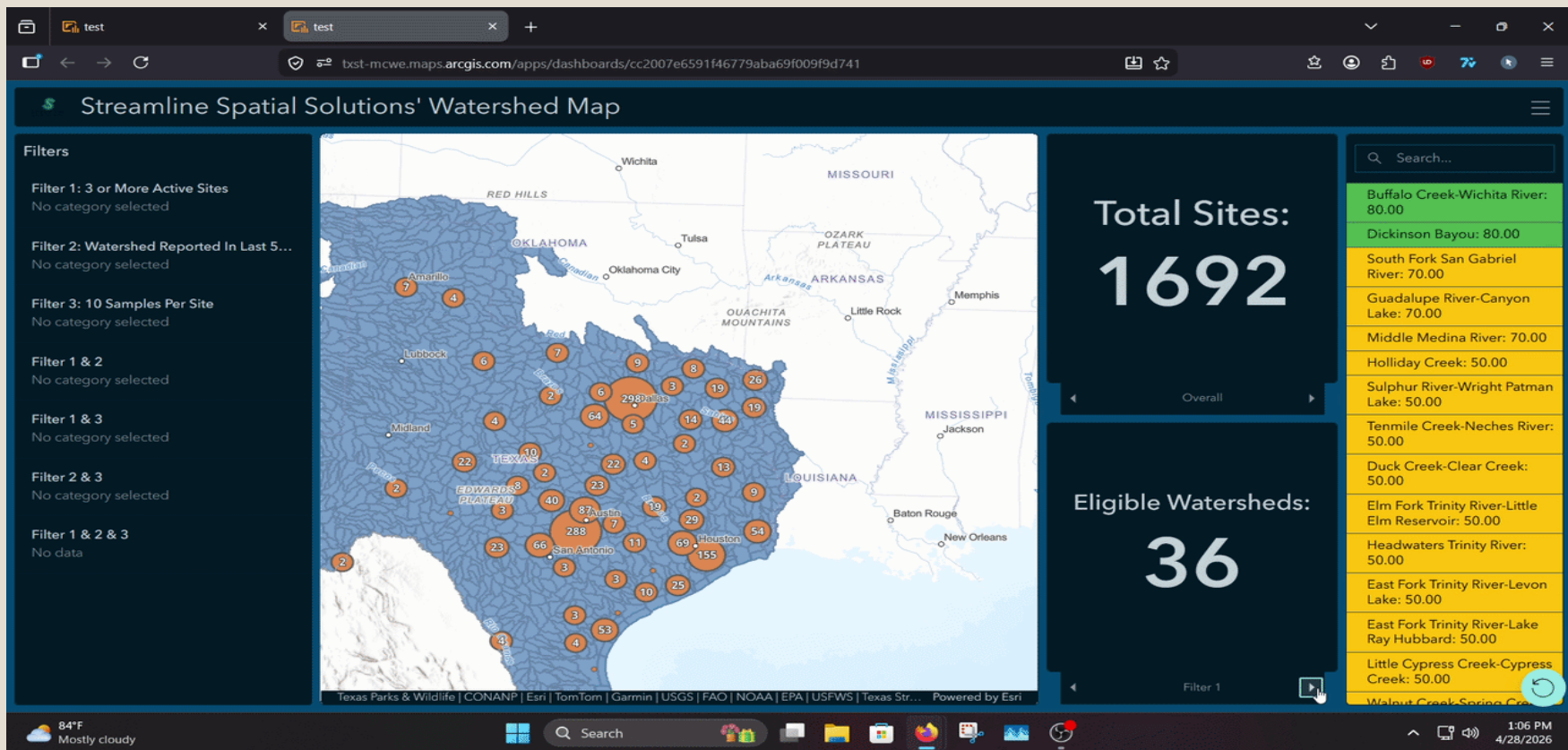
Filters



Summary Statistics



Scoring System



Results & Discussion

Future Methodology

- Allows for new data entry
- Sub-basin filtering

Dashboard Filters

- Quickly Identify watersheds
- Summary Statistics

Scoring Weights

- Site: 50%
- Water quality: 30%
- Reporting history: 20%

Efficient Management

- Improve client's workflow
- Targeted efforts

Limitations & Future Fixes

Software Issues

- Inconsistent changes
- Slow loading time
- Publishing errors

Arcade Expressions

- Calculation issues with shared layer

Time Constraints

- Software troubleshooting
- Alert & search system
- Community Scientist contact

Conclusion

Completed Dashboard

- Better visuals of data
- Improved reporting prioritization

Future Use

- Methods can be adapted to other workflows
- Used to integrate new data



Thank you!



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Questions?