Ricardo Saavedra
Lead Principal
Vizonomy Inc

December 17, 2024

Kurt Woolford
Executive Director, Stormwater Management Commission
kwoolford@lakecountyil.gov

RE: **Request for Proposals - INFLOW FY2025**

Dear Kurt,

Vizonomy enthusiastically submits the following response as original creators and supporters of the INFLOW Platform. We are excited to continue building on the system and use our specific knowledge designing similar platforms for the benefit of the Stormwater Management Commission.

After two year of collaboration, the INFLOW platform has catalyzed a need to further these digital efforts through a more expansive data architecture; a more capable project management workflow; new views and mapping updates; and new communication channels and forms. Vizonomy has the experience and both the technical and contextual knowledge to help facilitate these initiatives cost-effectively and reliably. The following response offers our approach, budget, and schedule for achieving all such objectives.

Since 2014, Vizonomy Inc. (based in Arlington, VA) has helped organizations and government agencies manage large geospatial datasets and custom web experiences. From creating ArcGIS and CARTO architectures that feed project and environmental data into the Mile High Flood District's (in Denver, CO) project management solution to other systems that monitor tree reforestation efforts through satellite imagery or visualize flood risk across urban communities (in Washington DC), we offer elegant and purposeful solutions.

In summary, Vizonomy is enthusiastic to once-again engage with Lake County's Stormwater Management Commission. We will work diligently to continue enhancing the team's product offering and provide thoughtful insight. Our team is at your disposal.

Thank you,
Ricardo Saavedra

vizonomy

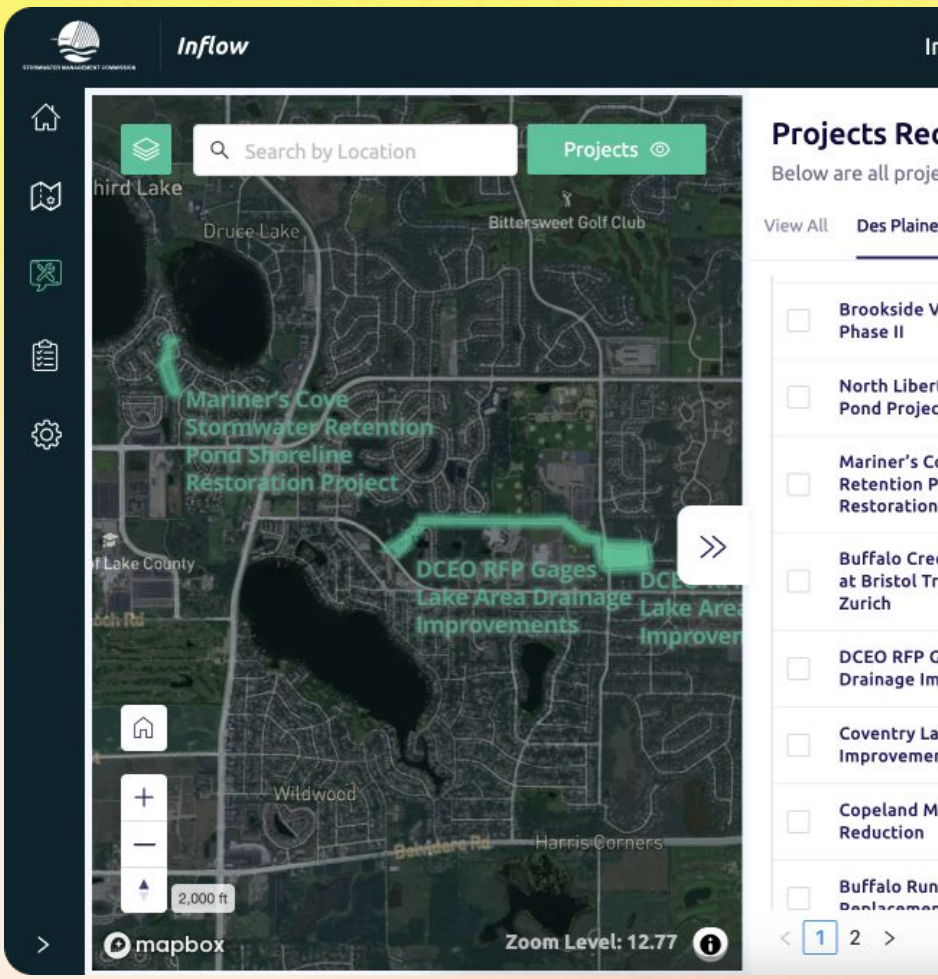
INFLOW FY25

CAPITAL MANAGEMENT & PLANNING SOFTWARE

Prepared for:
Kurt Woolford
Executive Director
Stormwater Management
Commission in Lake County, IL

December 17, 2024

Created by
Ricardo Saavedra
Vizonomy Inc.
ricardo@vizonomy.com

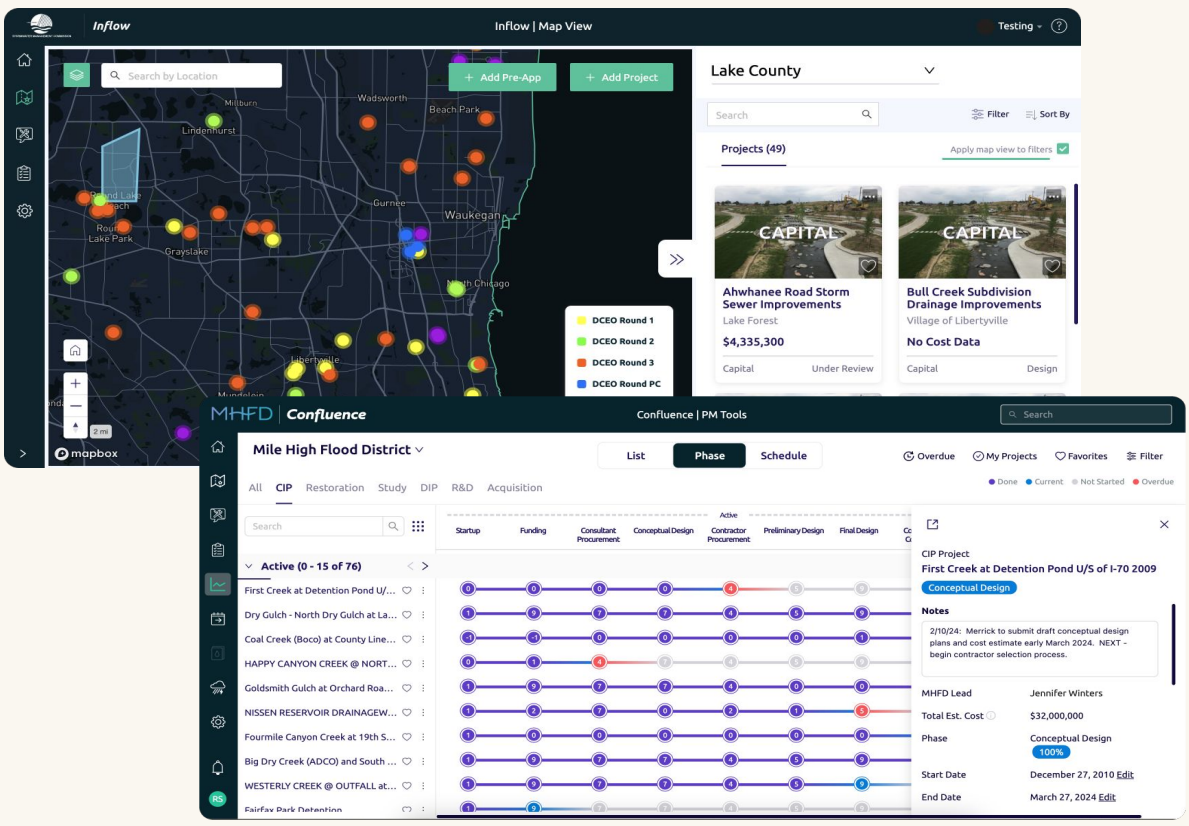


Project Objectives

The **Stormwater Management Commission** in Lake County continues to envision a future where project management and public communication can coexist within a centralized digital framework. Following-up on its initial investment in 2022, the team plans to accelerate adoption of the new INFLOW platform by further streamlining multiple datasets and creating new workflows that will allow internal staff to better monitor and evaluate projects, track changes, and receive feedback. A new project management module will allow staff to define milestones, add dates, and store notes on projects that are tightly integrated with the agency's existing GIS software. Datasets feeding the system will also become centralized and properly structured and transformed. While new Complaint and WMB forms will further scale the system's existing geospatial and data capture capabilities across new areas.

Through this new effort, SMC Staff will be able to edit, export and share project information easily and reliably. Information will be available on a tiered-basis, and more importantly, it will be interoperable with other systems -e.g. PowerBI and Tableau- for further visualization and analytics.

The volume of objectives outlined are possible through the investments of other agencies and their collaboration with Vizonomy to develop similar solutions. Through customizations tailored to SMC, nearly all requested features are achievable at a fraction of their original cost. With the successful completion of this phase, INFLOW will have a new and expansive data architecture with the workflows necessary to help the agency drive transparency and efficiency.



Maintenance Measures

Vizonomy will provide comprehensive maintenance and support services, ensuring optimal performance and reliability. Services will include regular system updates, patches, and upgrades to the underlying libraries - such as Mapbox, ArcGIS.js, and Node - to incorporate the latest features and security enhancements. Additionally, the team will offer technical support with defined response times for troubleshooting and resolving any issue related to the application's functionality. Proactive monitoring, periodic performance assessments, and user training will also be part of the maintenance plan to ensure seamless operation and user satisfaction. A summary of available activities is listed below:

Adaptive Maintenance:

- System Compatibility Updates: Adjustments to ensure the application remains compatible with new versions of operating systems and software platforms.
- Integration Adjustments: Modifications to maintain seamless integration with updated third-party tools or databases.

Corrective Maintenance:

- Bug Fixes: Identification and resolution of software defects or issues affecting functionality.
- Performance Troubleshooting: Investigation and correction of performance bottlenecks or errors impacting system efficiency.

Preventive Maintenance:

- Regular System Backups: Scheduled backups of application data and configurations to prevent data loss.
- Routine Health Checks: Periodic reviews of system performance and security settings to identify and address potential issues before they impact operations.

Perfective Maintenance:

- Feature Enhancements: Implementation of new features or improvements based on user feedback or evolving requirements.
- UI Updates: Refinements to the application's interface to improve usability and user experience.

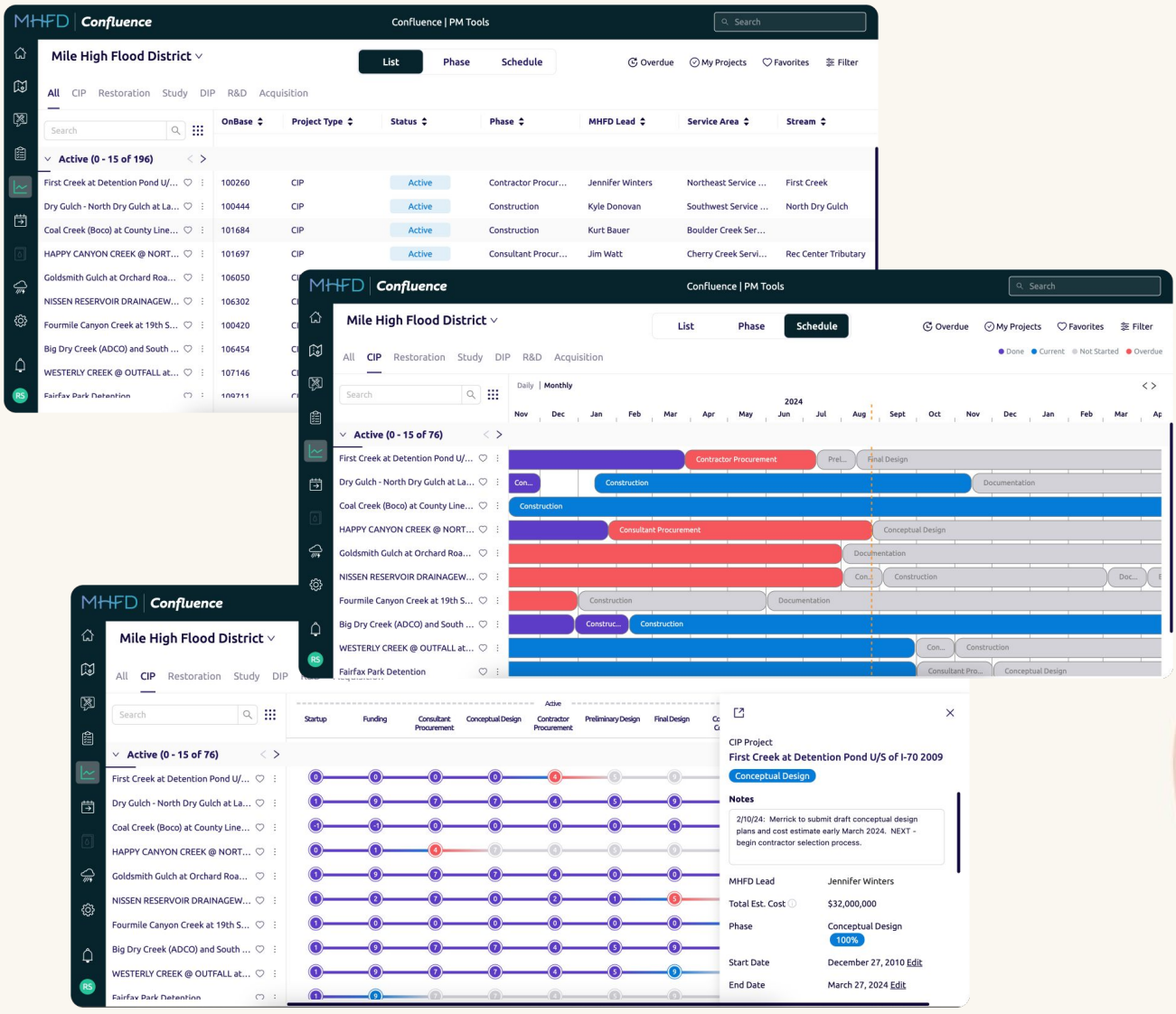
Types of Software Maintenance

Project Scope - Part 1

The following provides a description of all activities outlined in the scope of work and budget.

1. Project Management Workflow Reusing the framework originally designed for the Mile High Flood District, the proposed “PM Tools” workflow will allow SMC staff to view projects in a list, phase, or schedule view. Each project type has preset phases, where staff will be able to establish start and end dates, customize checklists, and append notes.

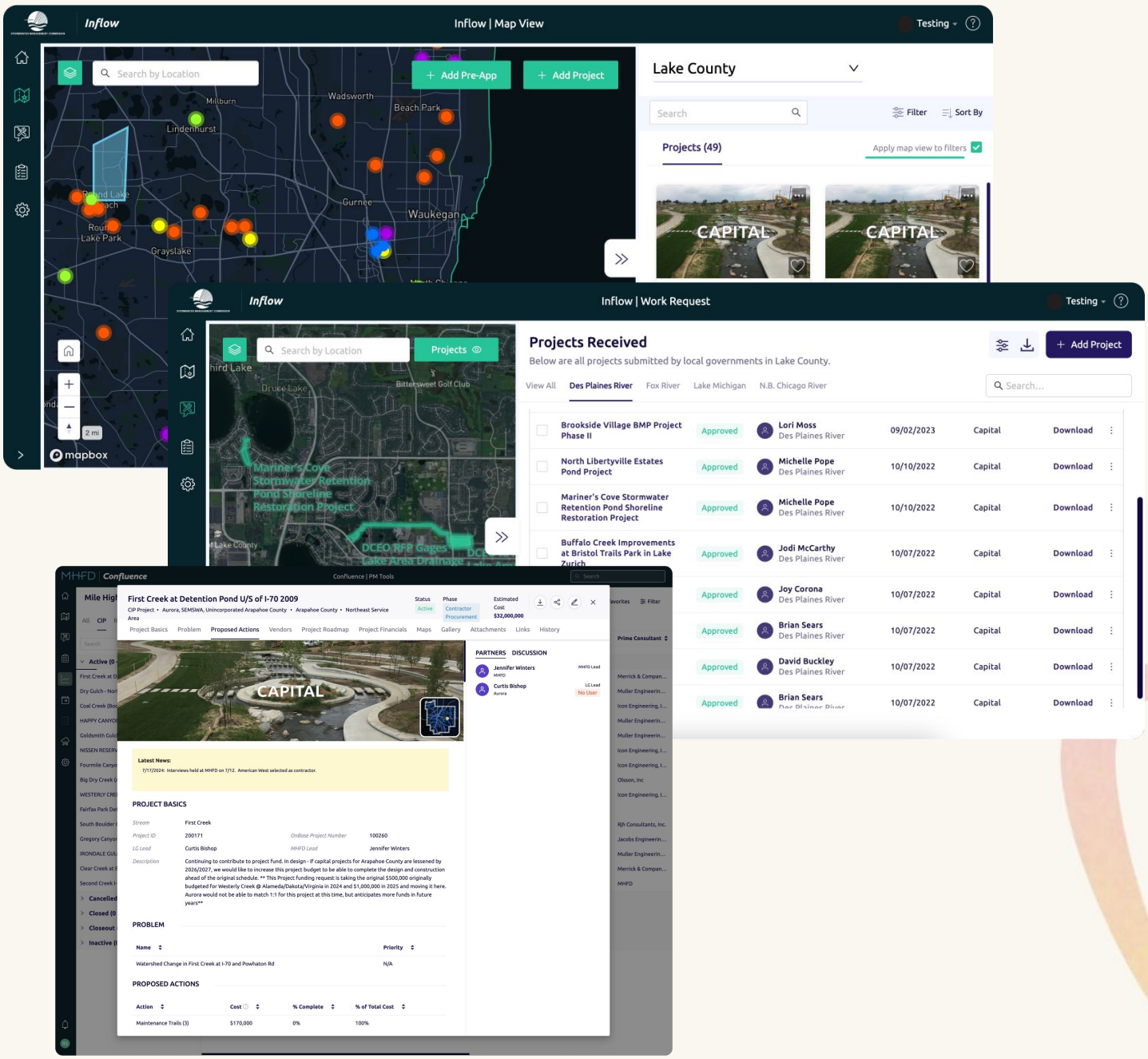
Reporting is facilitated through various filters, including by project manager, location, favorites, team member and others. Underlying these views is a complex yet flexible SQL-based data model which will require API creation, data cleaning and transformation of all existing datastreams.



Project Scope - Part 2

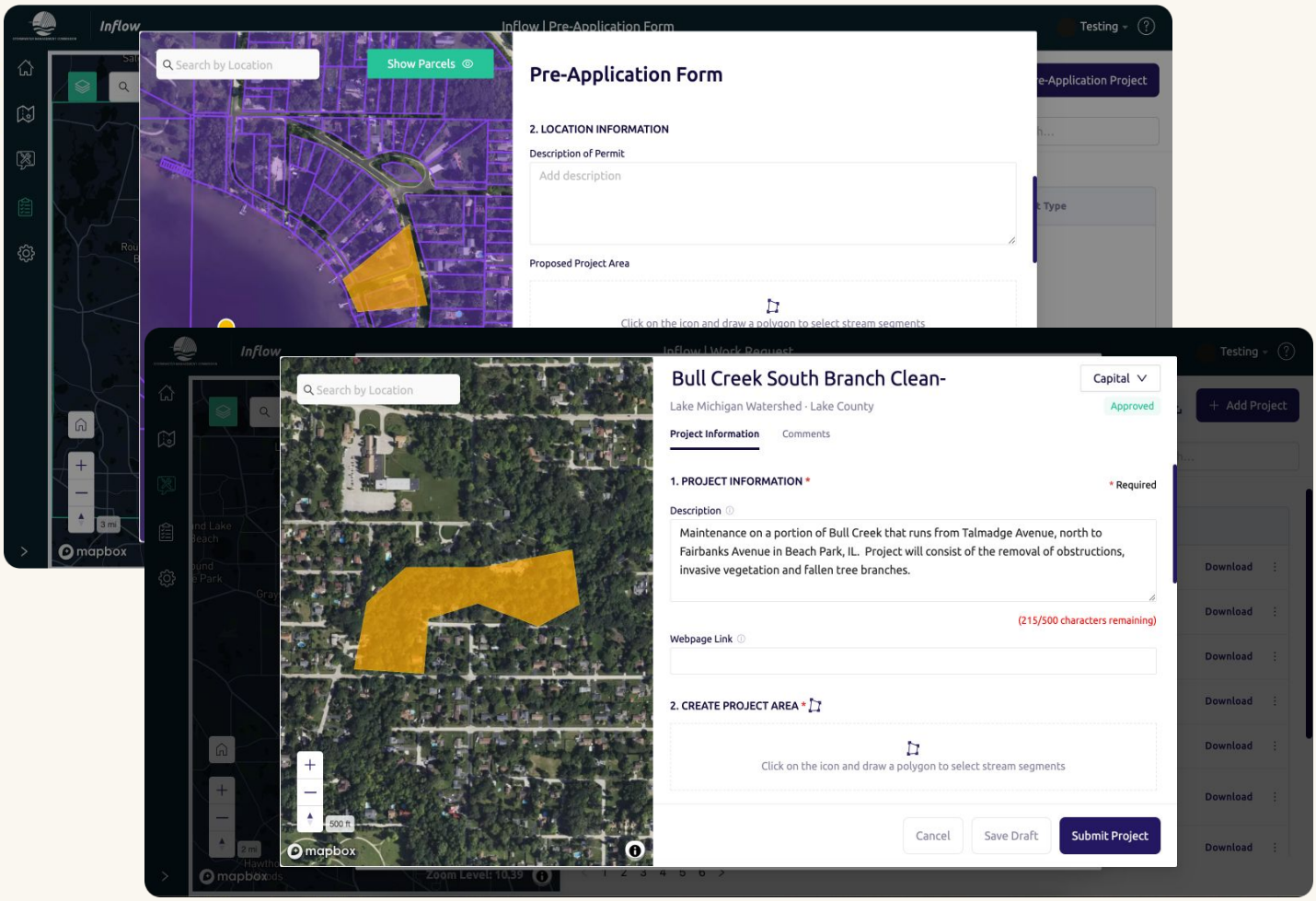
2. General, Mapping and Data Updates To continue improving INFLOW, project data will be centralized, allowing information to freely flow across multiple views: from the upcoming Project Management view to the Detail Page and through various mapping forms. Alongside the data cleanup, the [Project] Detail Page and all mapping instances will be refactored to accommodate these system updates.

Once all data and design activities are achieved, new features will be developed and released, such as the ability to enable multi-part polygons, change basemaps, add new layers, and update project stylings. A new feedback module and tutorial will also be released; and the existing ability to assign the cover image to a project will be interoperable with the new [Project] Detail Page.



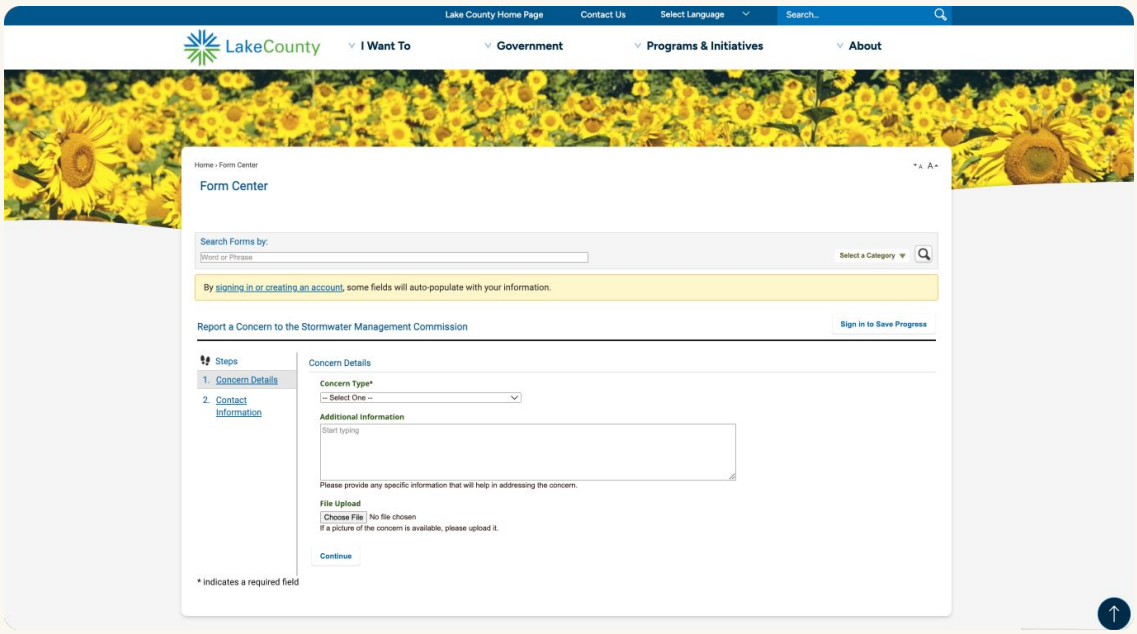
Project Scope - Part 3

3. The Create Project and Pre-App Forms Beyond the mapping updates under [1], minor improvements will offer the ability for SMC staff to update the *program type* for a project; allow users to upload a zip file of documents and images; and provide users the ability to change nodes and vertices on the polygon without overwriting it (through versioning).



Project Approach - Part 4

4. CIRS Intake Form The form will be redesigned (replacing the version below) and integrated within the new data architecture. As with other forms, a geospatial component may be included; email notifications sent; and two-way in-app communication facilitated.



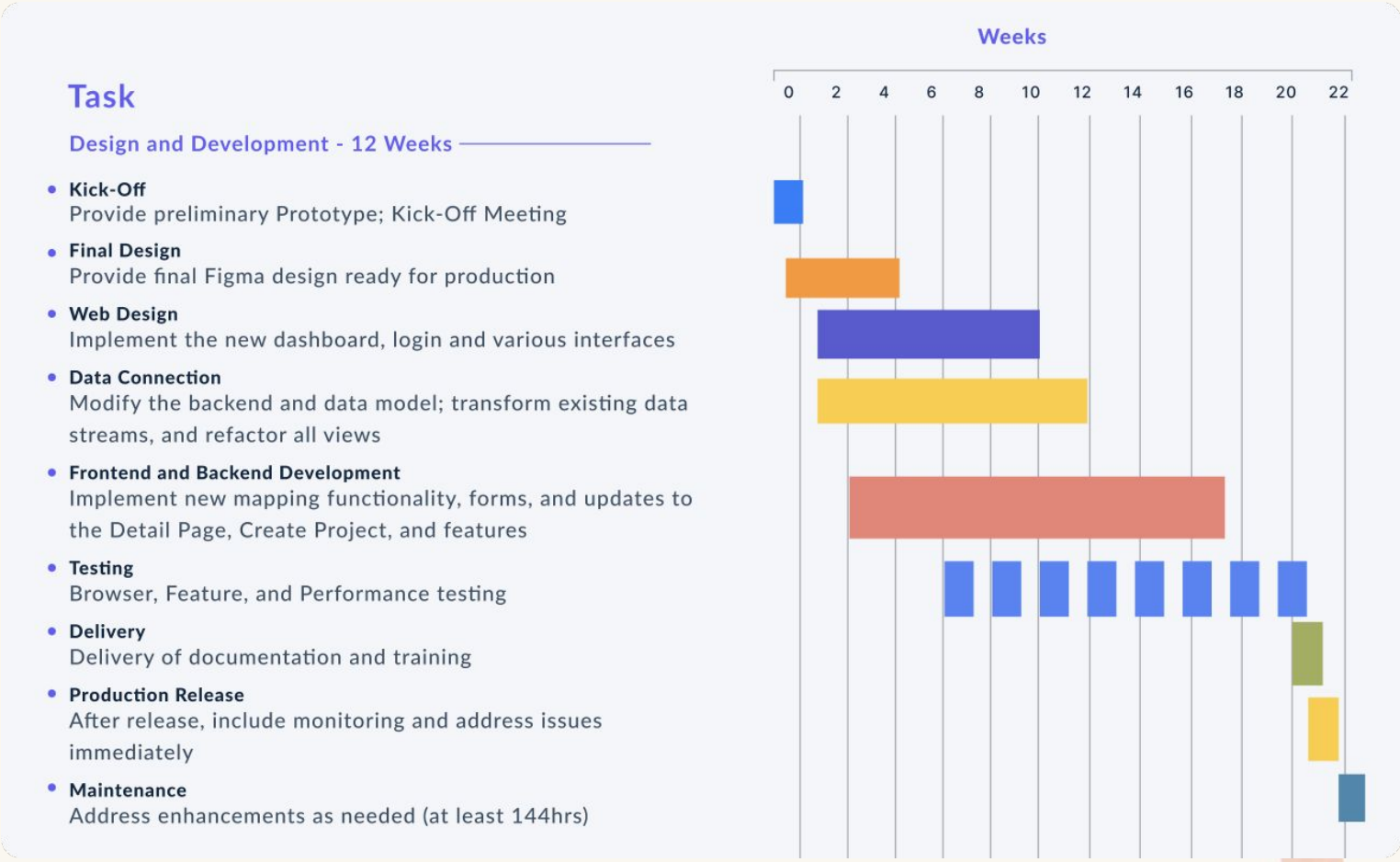
5. WMB Application Similar to the *CIRS Intake Form*, the WMB Application will become digitized within INFLOW's architecture. As with above, the effort includes prototyping, web design, and development of its various sections: Proposal Request, Contact, Project Information, Financial, Description, WMB Benefits, WMAG Benefits, Statement of Local Commitment, Upload Documents. All information will be received in a new view, similar to how Projects and Pre-Apps are received today.

6. Maintenance Activities Once all features and updates have been approved and released, our team will provide necessary support to data, design, and development issues; library updates; and minor enhancements. The team will provide 12 hours of support per month for a total of 144 hours. All activities will be catalogued and submitted for review on a monthly basis.

Schedule

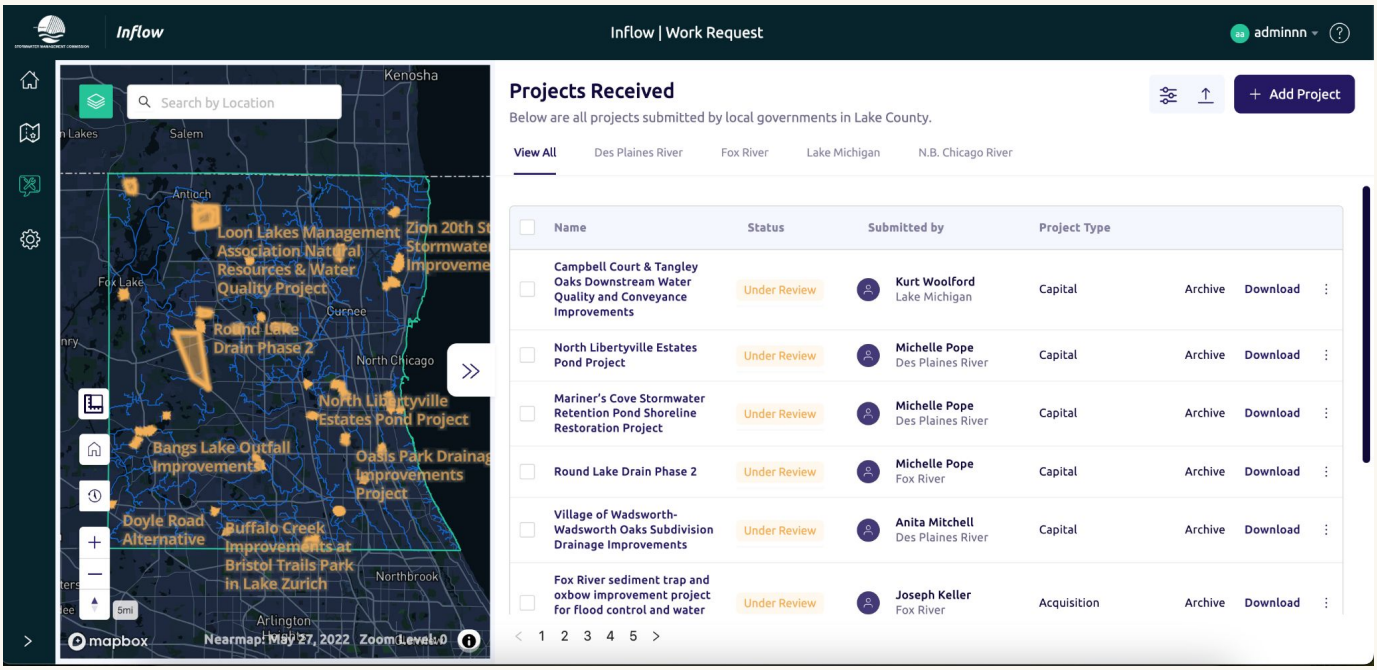
All efforts outlined anticipate a **five to six month design-build process** involving a multi-faceted team led by a product specialist. A kick-off meeting will initiate the wireframing and design process during which all requirements will be re-evaluated, modified, and prioritized for release. The data model and web design process will be implemented concurrently, after which, the team will begin its refactoring efforts. A feature release schedule will then be updated prior any web development. Once the build process is completed, testing will occur across popular browsers (e.g. Microsoft Edge, Google Chrome, Firefox, and Safari) and all features will be measured for responsiveness. After delivery, the team is committed - as always - to ensure all features are accepted and will support SMC during the maintenance period.

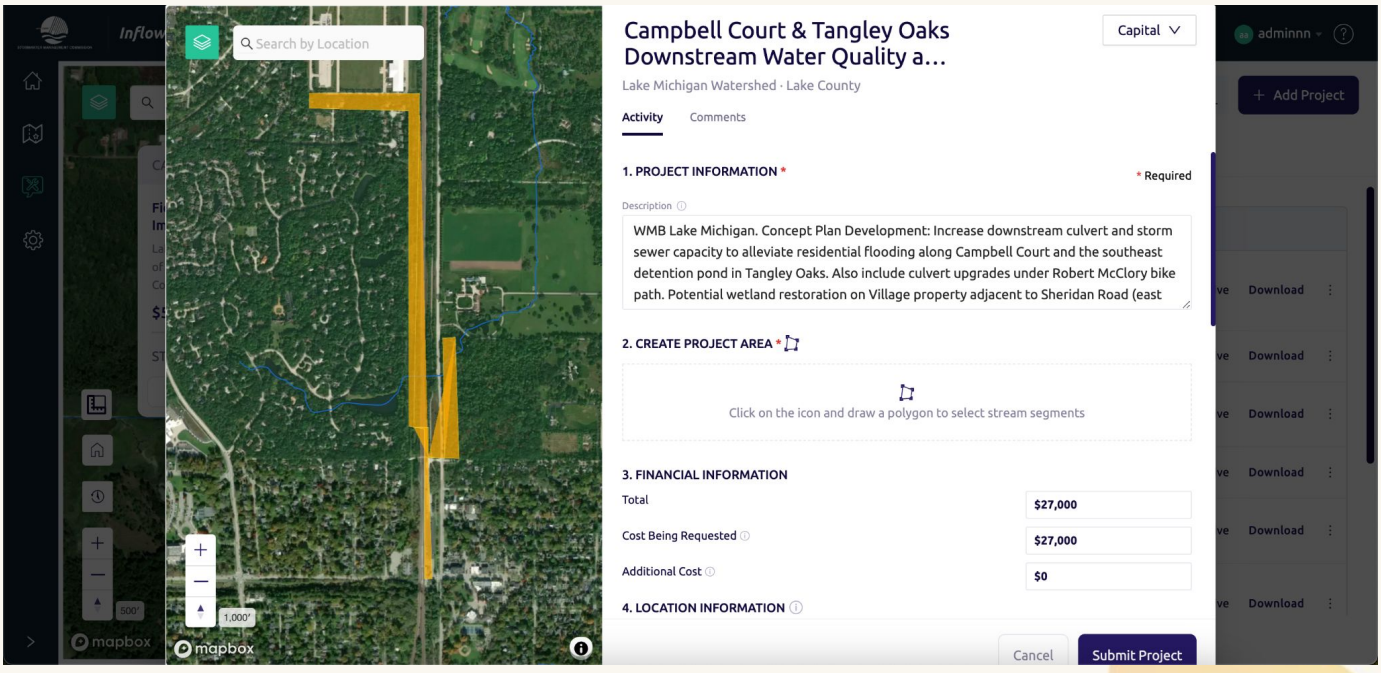
Once released, **maintenance efforts** will be limited to keeping “the lights on”, ensuring that any security patches and software updates are applied and that runtime is at least 99.9%.



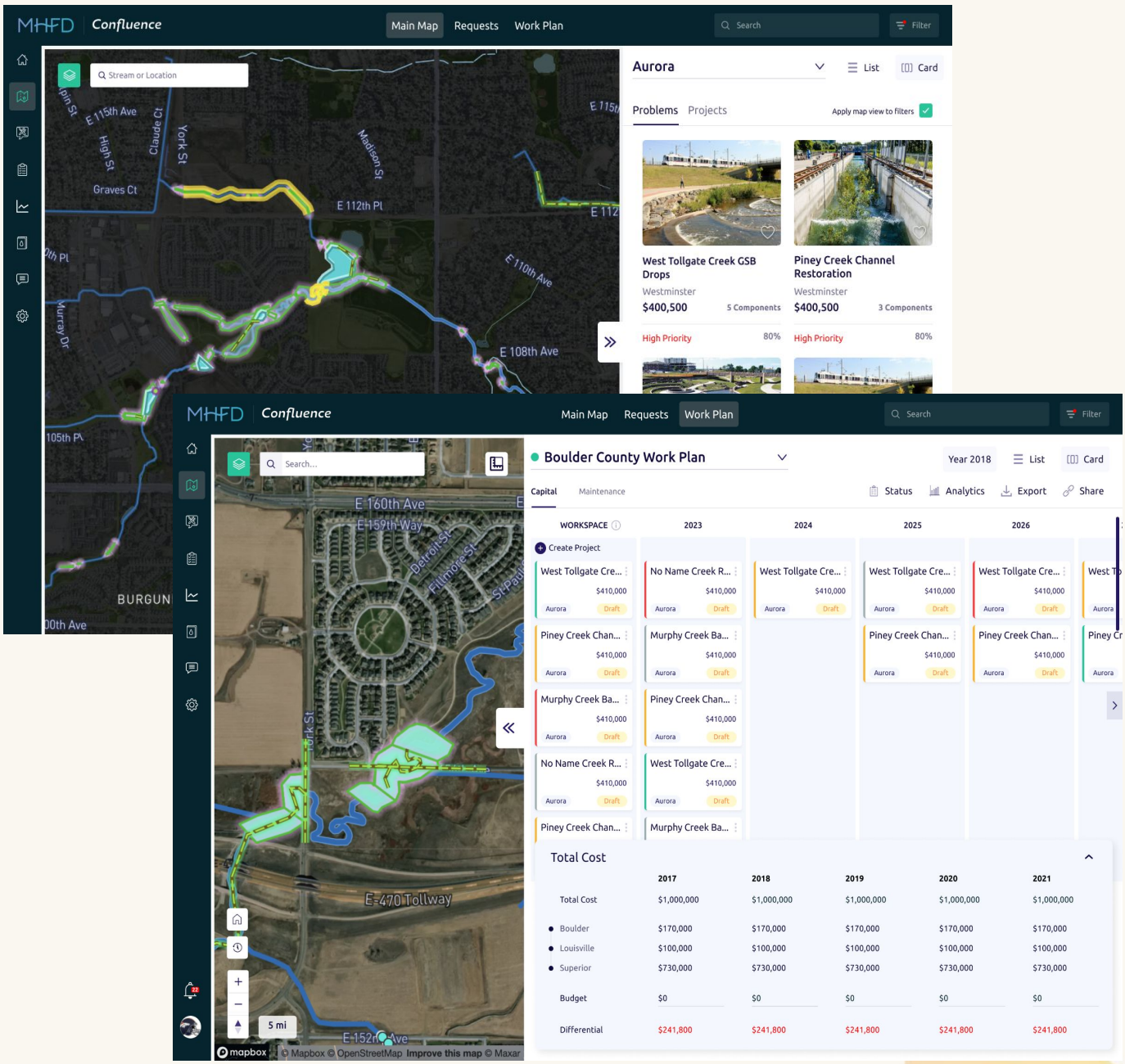
Similar Previous Work

Inflow (2022) for Lake County, Illinois' **Stormwater Management Commission** is smaller version of the Mile High Flood District's Confluence solution. Using CARTO/ArcGIS, React, and a SQL database, the online solutions features a project management system with notifications, mapping, project creation forms, and email notifications.

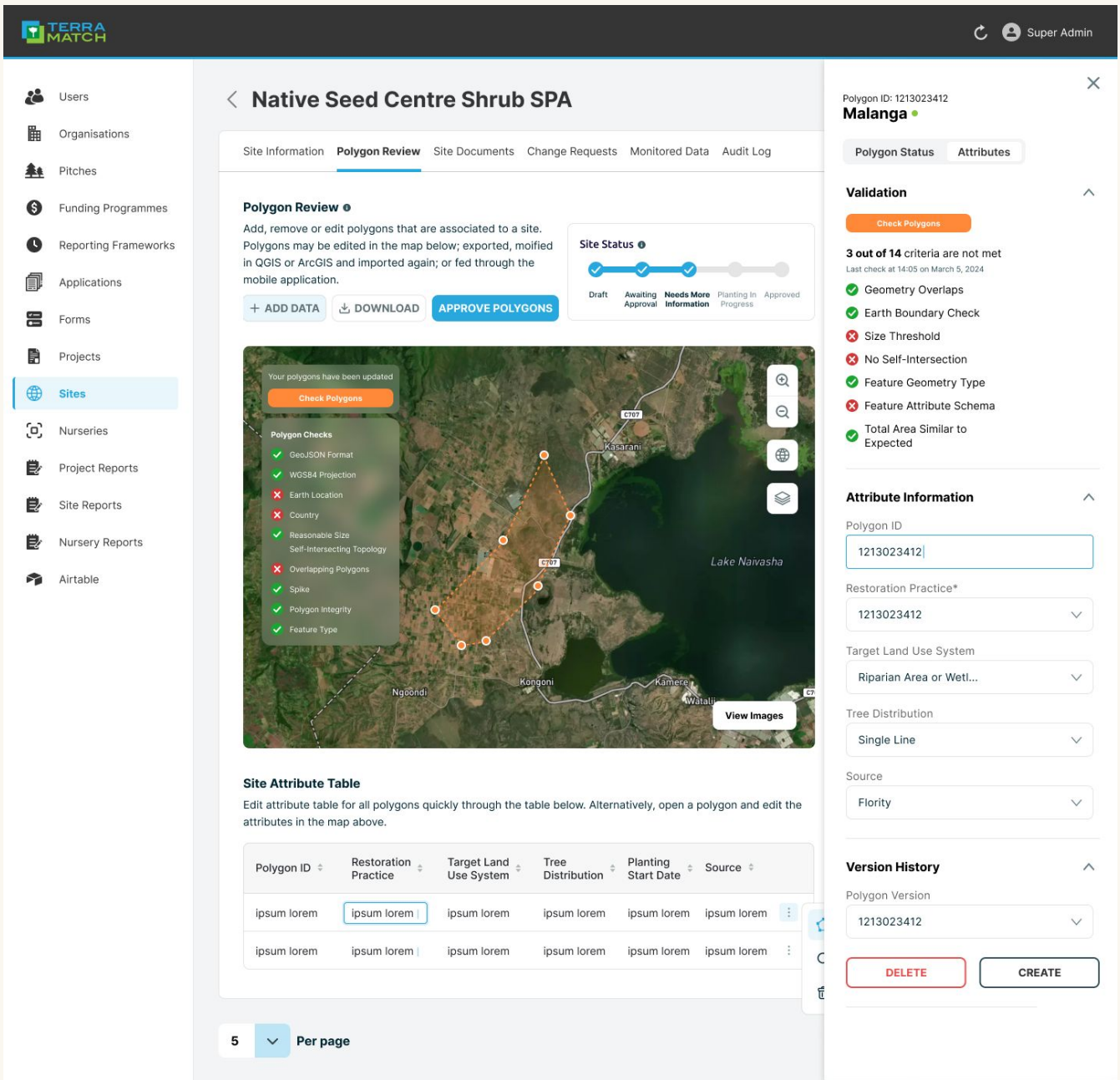




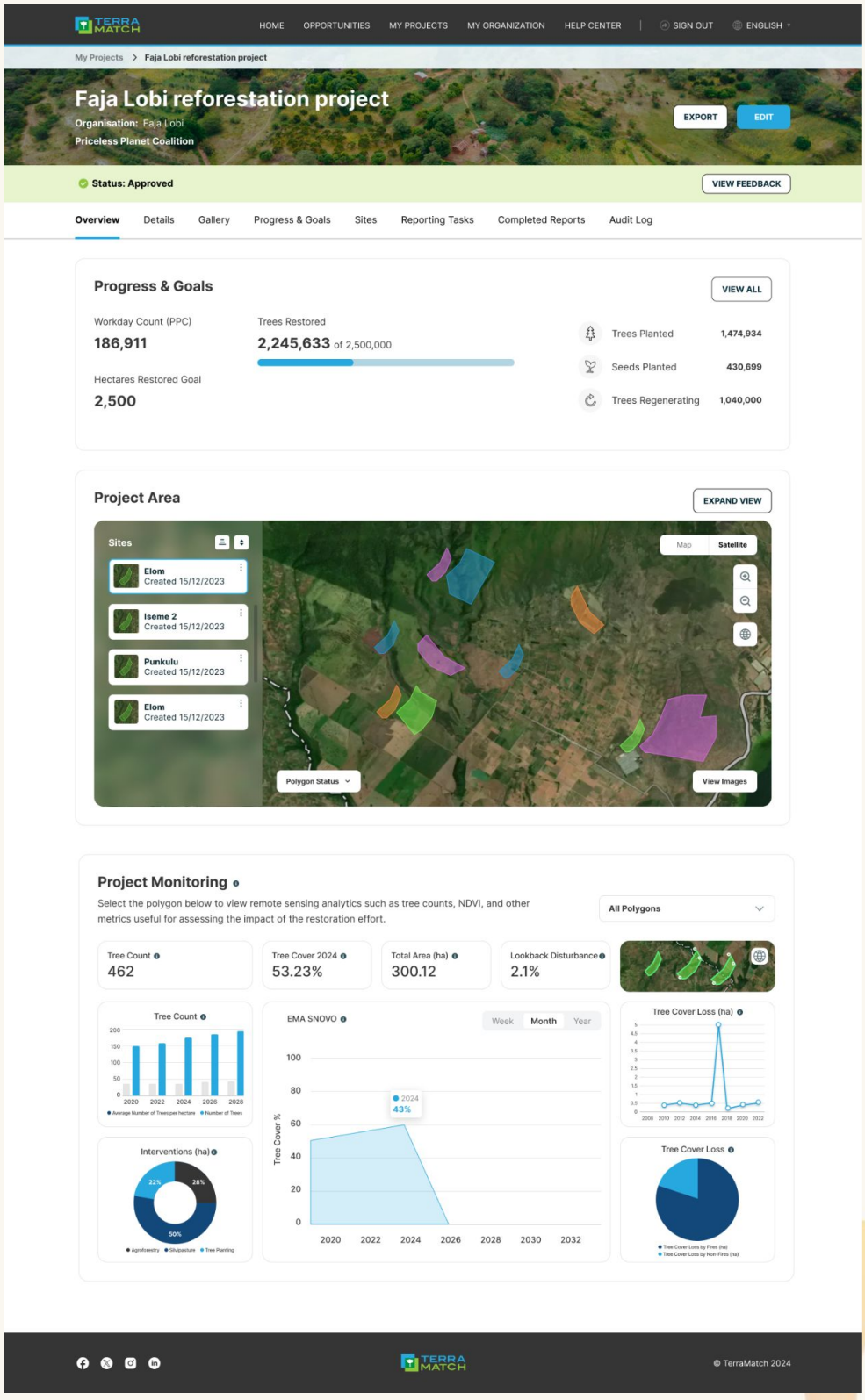
The [Confluence Project Management Hub] for the **Mile High Flood District** includes features such as media galleries, dozens of attributes for each project, team permissions, a user management system, API creation and management, interactive mapping and graphics, exports, and a carefully crafted user research process over the last two years. In early 2023, the SQL data model was replaced for a more modularized approach and the entire code refactored (still in React-Admin), in preparation for significant changes in late 2023 and early 2024.



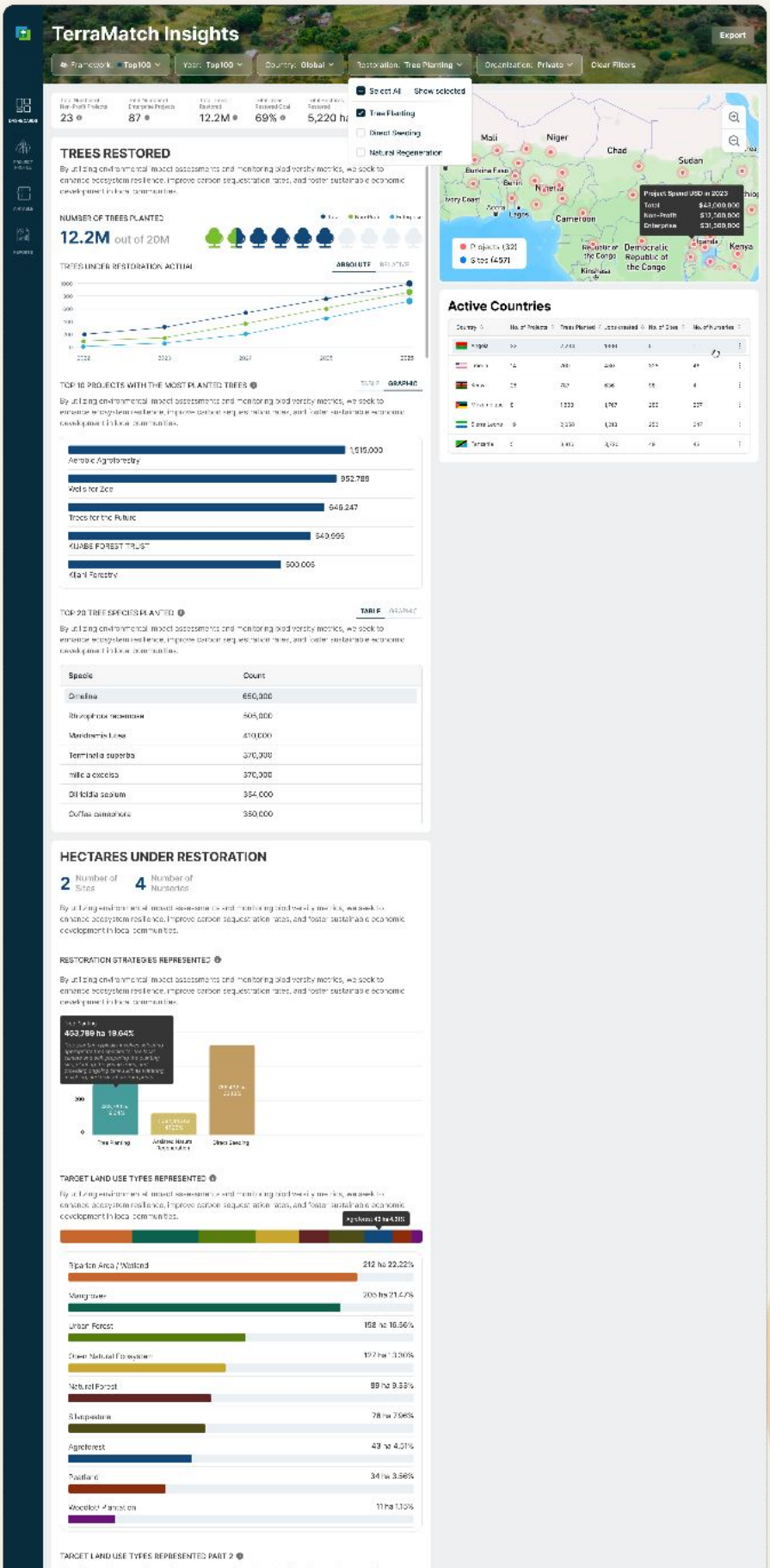
TerraMatch (2024) for **WRI's Data Lab** is Vizonomy's first collaboration with the organization and includes not only performing maintenance activities and bug fixes, but expanding the system to be more geospatially-focused and allow users to create, collaborate, manage and approve (planting area) polygons more easily. From concept to implementation and from new data architectures to design refreshes, Vizonomy has used Mapbox, MariaDB, SQL, Python, PHP, React and Vercel to release updates quickly. Below is the Admin interface for collecting, validation and approving polygons.



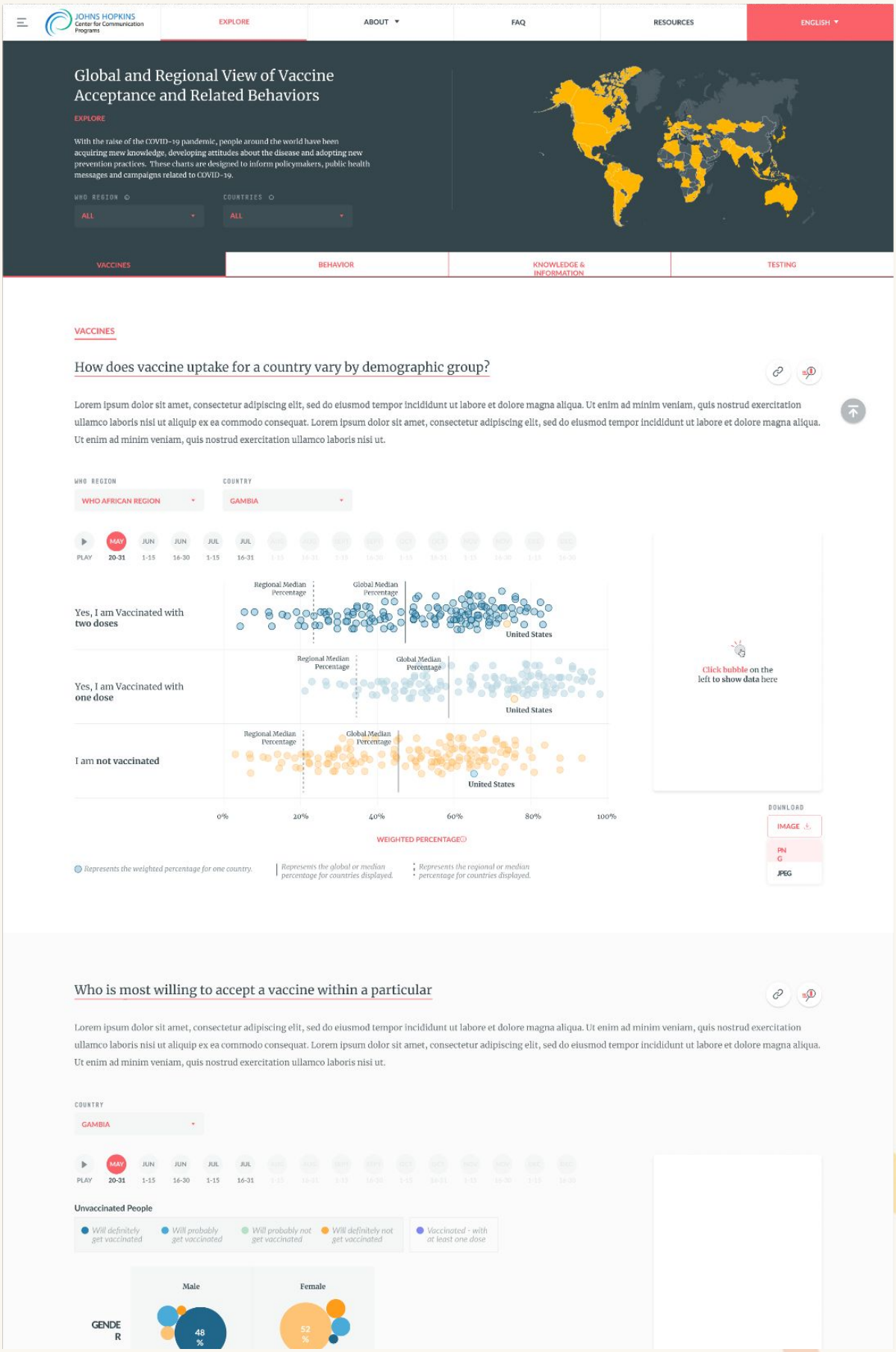
The Project Developer view of TerraMatch is shown below with a re-organized layout, increased mapping capabilities, and a new monitoring system to assess planting efficacy across thousands of locations.



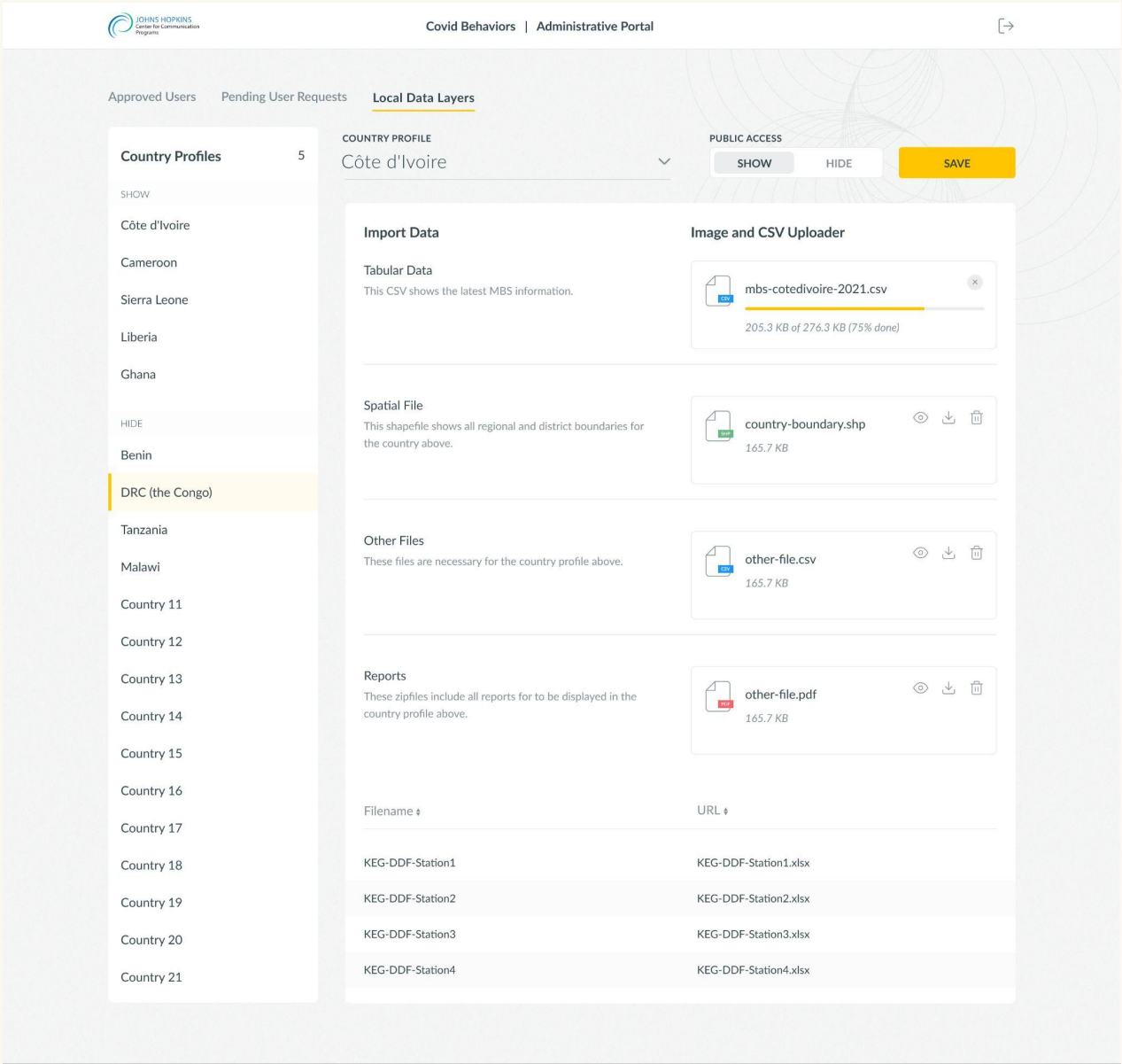
Complementing TerraMatch is its public-facing and analytical counterpart, TerraFund, built from the ground up using React, Mapbox, MySQL Spatial Extension, and relying on a network of new API endpoints, d3.js graphics, and the same data architecture as TerraMatch.



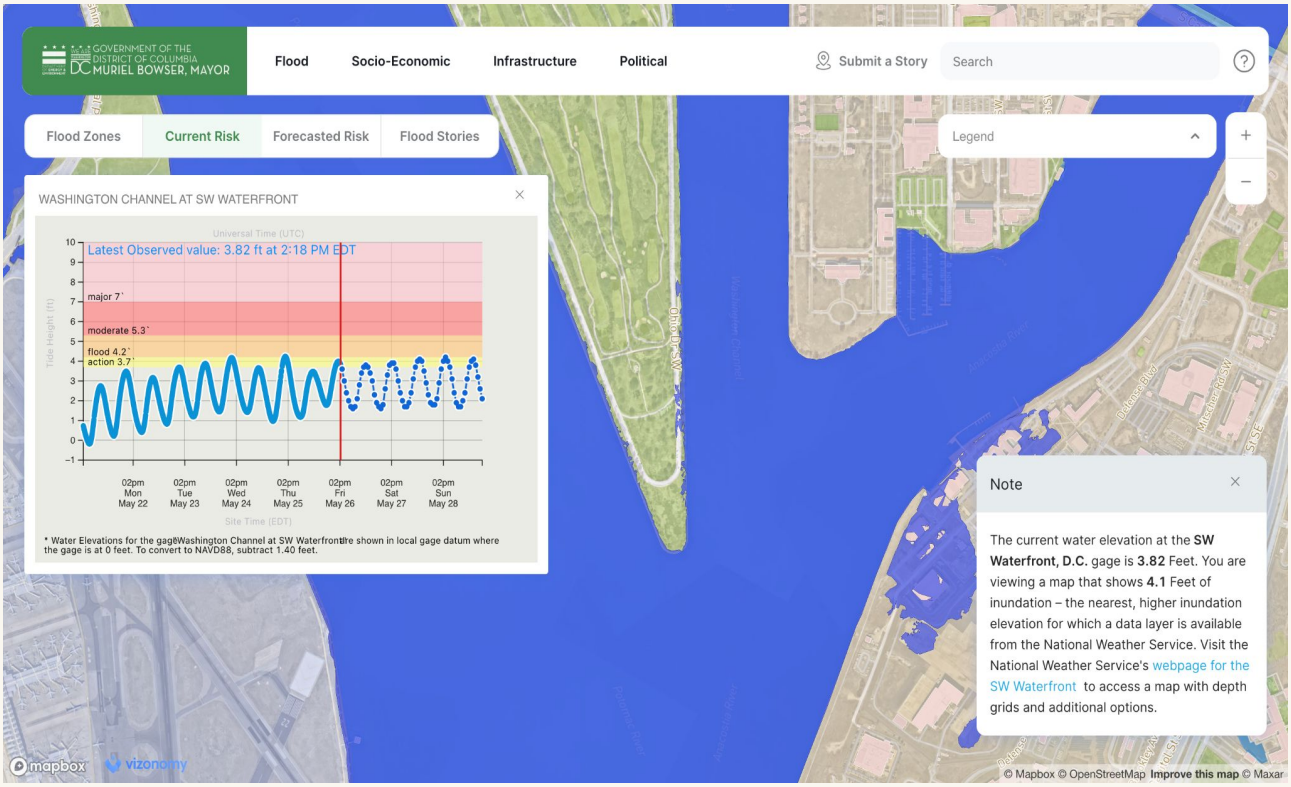
[Covid Behaviors Data Platform](#) (2021) for the **Johns Hopkins Center for Communication Programs**. An interactive dashboard with dynamic graphics and maps powered by React, CARTO and a SQL database, with data updated biweekly through a custom interface.

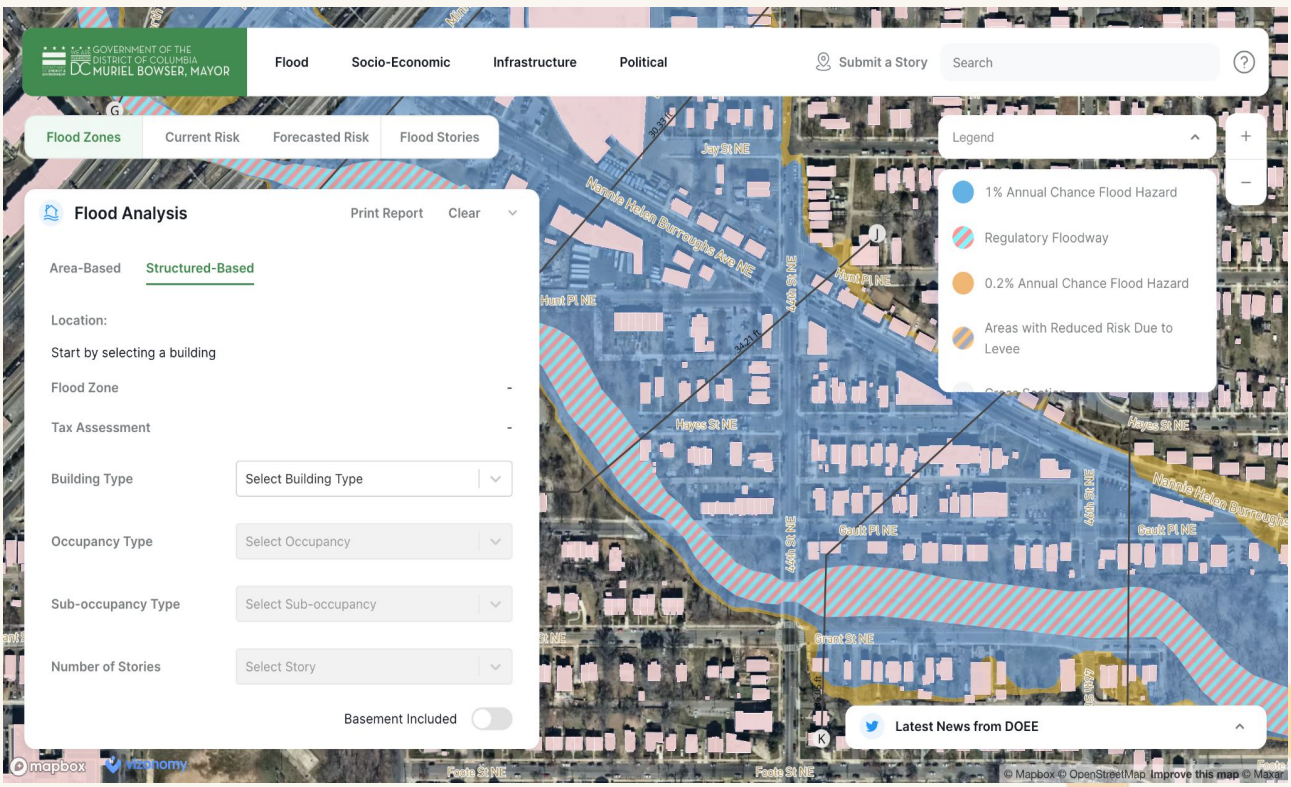


The **Covid Behaviors Data Platform** includes a custom uploader that captures CSV, XLSX and Shapefile data, which is subsequently organized into custom data displays.

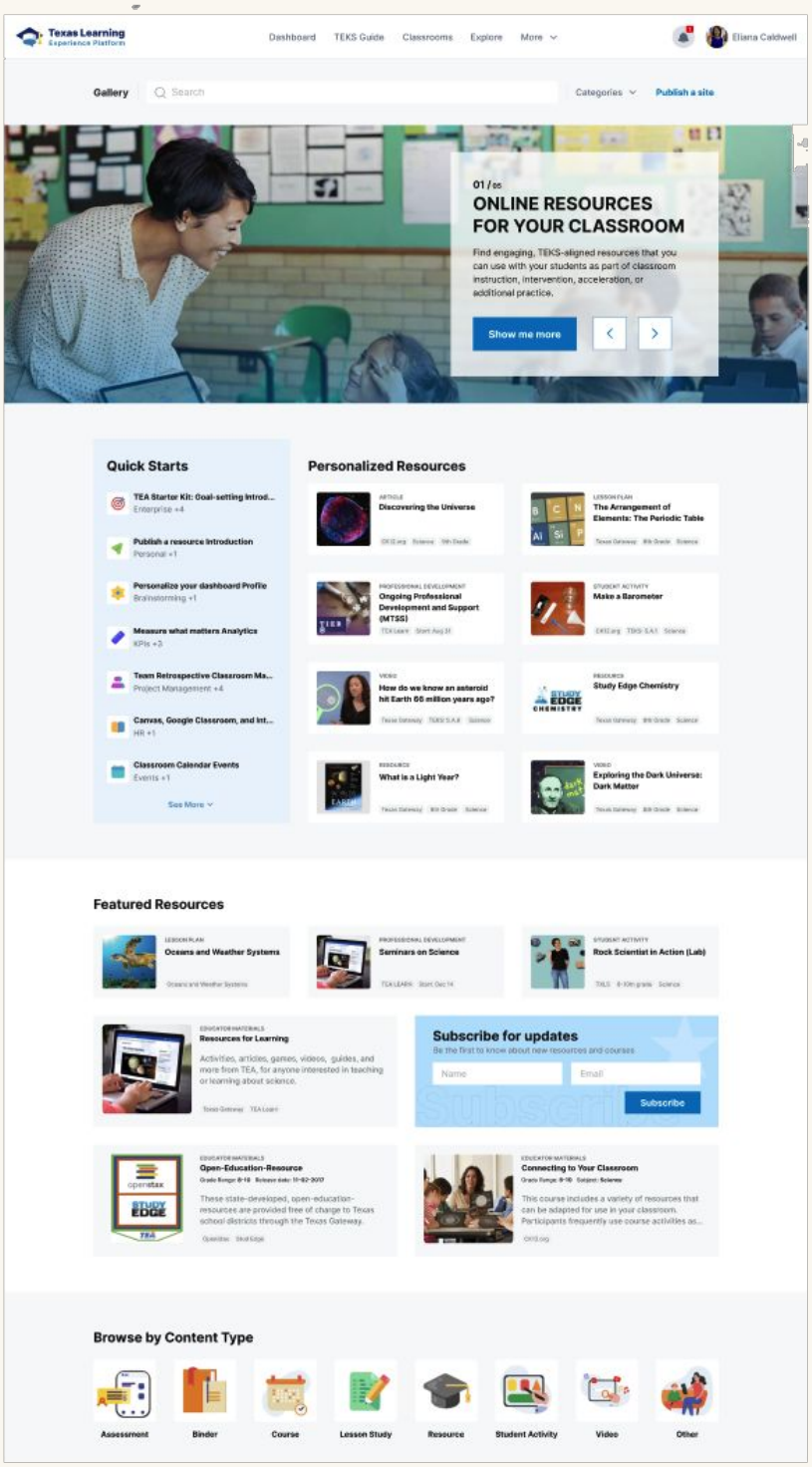


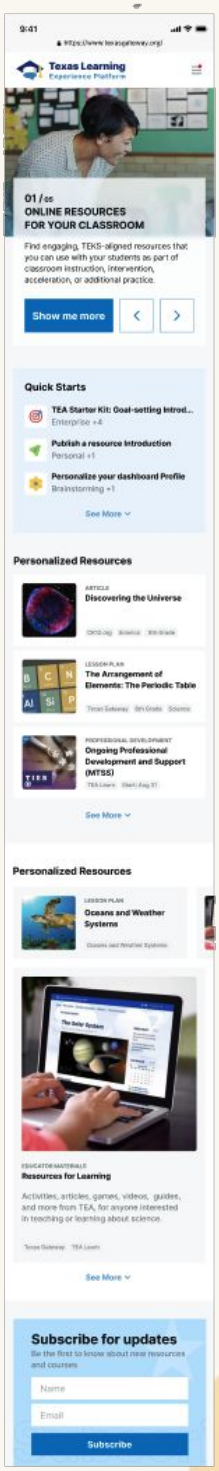
DC Flood Risk Viewer (2023) for **Washington DC's Department of Energy and the Environment** includes dozens of socio-economic, infrastructure and flood related layers connected via API. The viewer is mobile friendly; allows for expected loss analysis at the building or area level; and reporting exports to PDF.

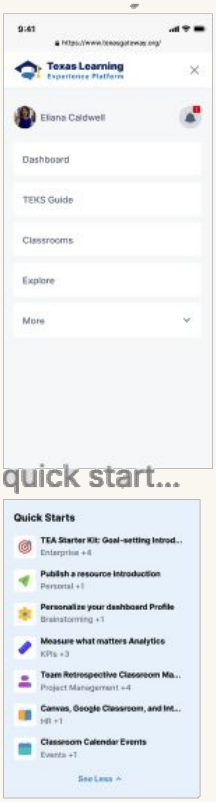




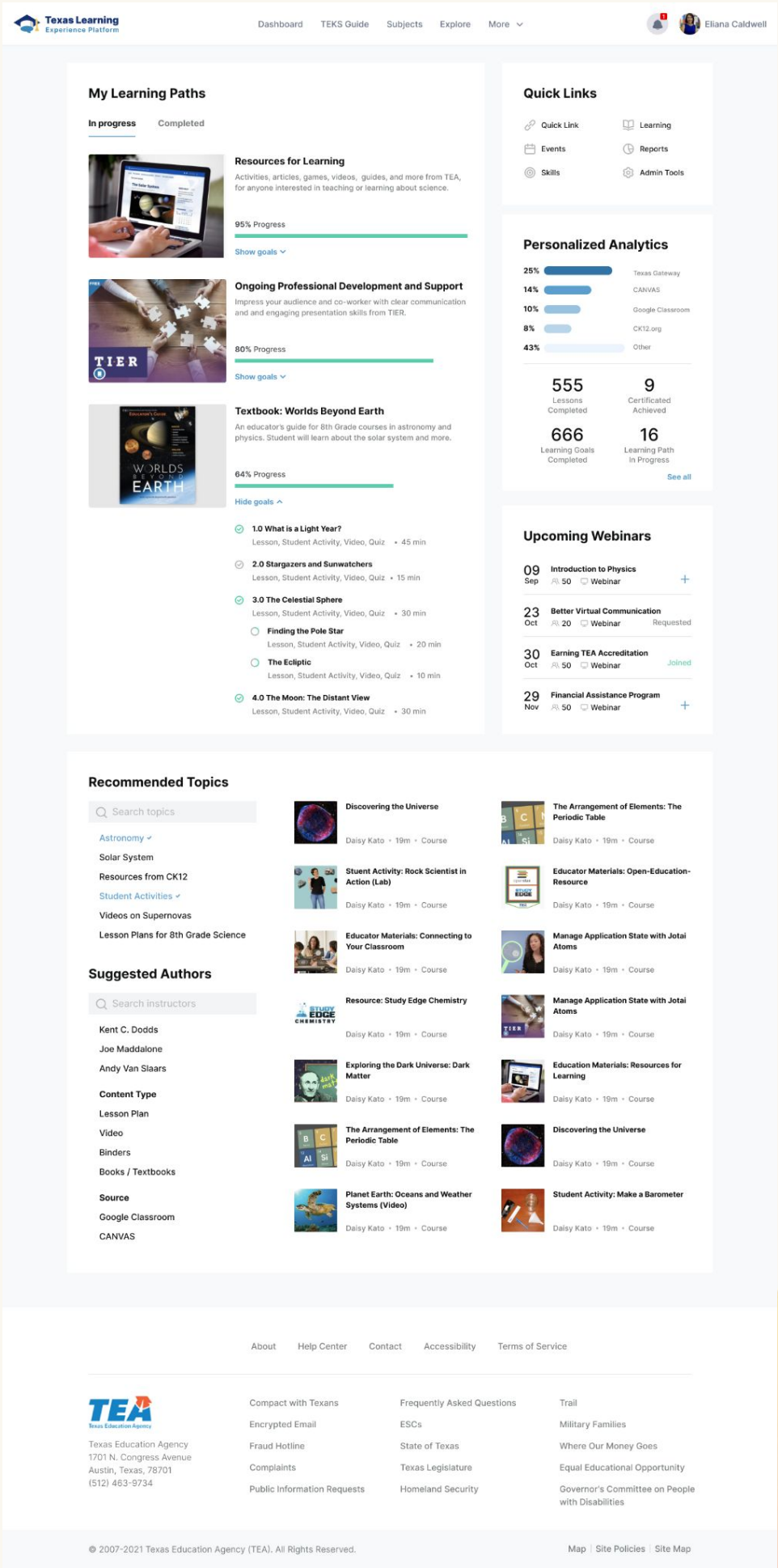
The **Texas Education Agency** and **Google Texas** approached Vizonomy for design and build support of a new content management system with personalized educational resources for teachers. Content is directed to users based on their preference, while Agency admins are responsible for uploading new content through template interfaces. All interfaces shared below are designed by Vizonomy and follow the same design session approach recommended for Terramatch 2.0.







The **Texas Education Agency** provides a simplified interface that allows teachers for content discovery and personalization.



Proposed Team

The team we are fielding excels at product innovation and relies on modern web design principles and advanced geospatial technology to fulfill the agency's needs. Our multidisciplinary team is able to advise SMC from a technical, operational and strategic perspective. Most staff included have been involved in the products previously referenced, including the Confluence Data Hub, and INFLOW.

Throughout project's lifespan, we expect to have various team members collaborate: from our **design and graphics teams** who will lead prototyping in Figma; to our **mapping, visualization, and frontend and backend teams** who will implement the platform using React, MySQL, Mapbox, ArcGIS API, D3, Node and other tools. Our steady hand throughout the project will be our Product Specialist who will provide focus, transparency, and steady continuity from wireframe to final release.

Key Team Members

Dotty Condori	UX/UI Designer
Addis Sempertegui	Mid-Level Engineer
Angel Cussi	Senior Engineer
Ricardo Saavedra	Product Specialist

Vizonomy Team (for specialized or surge capacity as needed)

UX/UI Design	Backend	Frontend	Geospatial	Data Analysis	Product
Rosalba Romero	Addis Sempertegui*	Melvin Cursi*	Jorge Monroy*	Angel Cursi*	Ricardo Saavedra*
Diego Condori	Danilson Burgoa*	Limber Vallejo	Cesar Gauchalla*	Eddy Mamani	Jóse Quintanilla
Dotty Condori*	Keffick Benavides	Pablo Vargas	Gabriel Safadi	Eyvind Emilio	Jóse de Lara (PowerBI)
	Jóse Ramirez*	Sergio Condori			Jairo Anaya*
	Rolando Troche				

*Senior

CVs

Ricardo Saavedra
Email address: ricardo@vizonomy.com
Phone: 704.962.6659
Title: Product Specialist

Years with Firm: 10+
Country/City of Residency: Washington DC

Education/Qualifications:
Columbia University, Bachelor of Civil Engineering, 2005-2009
Columbia University, Masters of Engineering and Finance, 2009-2010

Employment Record:
Vizonomy, 2014-Present
CEO and Lead Principal

ICF International 2012-2014
Associate and Data Visualization Product Lead for Climate and Transportation teams

Dewberry, 2010-2012
Civil Engineer and GIS Analyst

Columbia University, Lamont Doherty Earth Institute, 2009-2010 Spatial Analyst

Experience:
Vizonomy: Founded in 2014 and led growth in spatial analysis, web development, drone/satellite image processing, and real-time analytics for global clients (incl. the World Bank Group). The team has since grown to 32 engineers, data scientists, developers, and designers, working in projects as varied as agriculture management, transportation optimization, real-time weather analytics, and open data portal tool development. Lead developer for Vizonomy's Asterra Climate Risk Terminal, which is a software-as-a-service web platform designed for cities to understand their economic risk from severe climate hazards and long-term climate change. Currently used in more a dozen cities across the U.S. (and Washington DC), it has been recognized as the leading platform in this field by the White House.

Skills: HTML/CSS/JS, Angular/Bootstrap, React, Node.js, Mapbox, Carto, GDAL, QGIS/ArcGIS, MySQL, PHP, PostGIS/PostgreSQL, Transportation Engineering, Water Resources Engineering, Environmental Risk Assessments, Remote Sensing, Spanish.

Project Management: Budget

Below is the proposed fixed-price estimate (**$182,208**) , inclusive of taxes. Invoices are submitted following the delivery and acceptance of all requested features. And as previously observed, Vizonomy strives to provide additional services at no cost to SMC.

Lake County Inflow - Feature Inventory	SubTotal Hrs	Contingency	Total Hrs	Rate	Budget	Last Updated Thursday, December 19, 2024
2025 RFP Scope Planning	949.00	20%	**1,138.80**	$160.00	**$182,208.00**	

Item	Task	Theme	Dev	Design	Total	Cost	Status	SMC / Viz Comments
1	Ability to change nodes/vertices of polygon without overwriting polygon. Versioning.	Create Project	60.00	20.00	80.00	12,800.00	Not Started	
~~2~~	~~CIRS: Prototype and Web Design: Report A Concern Form (link)~~	~~CIRS Intake Module~~		~~32.00~~		0.00	~~Not Started~~	
~~3~~	~~CIRS: Web Development: Report A Concern Form~~	~~CIRS Intake Module~~	~~48.00~~	~~8.00~~		0.00	~~Not Started~~	~~Description/Image/Polygon Location/time submitted~~
4	CIRS: Organize and View CIRS Intake Module for SMC and Users	CIRS Intake Module	32.00	8.00	40.00	6,400.00	Not Started	
5	CIRS: Email Notification and Two-Way Comments and Notification	CIRS Intake Module	32.00	12.00	44.00	7,040.00	Not Started	Includes email to Inflow Admin, Project Creator, Return to Sender, Change Rquest workflows along with in-app notificaitons
6	Program type - SMC user can edit if wrong (Project Submitted page) - user can see (like status field) - WMB - SIRF - DCEO - Countywide 319 - WRF - Maintenance - Not sure	Create Project	3.00	2.00	5.00	800.00	Not Started	
7	New Project Management Module (AKA PM Tools)	PM Tools	320.00	80.00	400.00	64,000.00	Not Started	Includes the List, Phase, and Schedule views along with the ability to set checklists, dates, and notes
8	Consolidate data sources for both Projects Created and Existing Projects in order to enable compatibility with the Detail Page and other features across the Main Map and Work Request	Mapping	80.00		80.00	12,800.00	Not Started	
9	Dedicated hours to clean design for existing pages (e.g. Login, My Inflow, Main Map, Work Request)	General		60.00	60.00	9,600.00	Not Started	Includes an updated detail page that is compatible with existing and new projects
10	Add light basemap (consume mapsonline basemaps?)	Mapping	12.00	4.00	16.00	2,560.00	Not Started	Includes integrating basemaps discussed on 8/15
11	Update project and layer pop-ups	Mapping	4.00	12.00	16.00	2,560.00	Not Started	
12	Ability to change thumbnail (cover image) of projects on main map page	General	6.00	2.00	8.00	1,280.00	Not Started	
13	Loading screen for issues	General	0.00		0.00	0.00	Not Started	To be implemented at no cost
14	Feedback Module	General	0.00		0.00	0.00	Not Started	To be implemented at no cost
15	Tutorial (similar to MHFD)	General	0.00		0.00	0.00	Not Started	To be implemented at no cost
~~16~~	~~Upload a zip file of all project files (word doc, pdf, etc)~~	~~Create Project~~	~~8.00~~			0.00	~~Not Started~~	
~~17~~	~~WMB Application: Prototype and Web Design (desktop only): Proposal Request, Contact, Project Inforamtion, Financial, Description, WMB Benefits, WMAG Benefits, Statement of Local Commitement, Upload Doucments~~	~~WMB Application~~		~~48.00~~		0.00	~~Not Started~~	
~~18~~	~~WMB Appliation: Web Development: Proposal Request, Contact, Project Information, Financial, Description, WMB Benefits, WMAG Benefits, Statement of Local Commitement, Upload Documents~~	~~WMB Application~~	~~108.00~~	~~8.00~~		0.00	~~Not Started~~	~~Enable multi-part polygons or multiple polygons for a single entity~~
~~19~~	~~WMB Application: Organize and View WMB Application for SMC and Users~~	~~WMB Application~~	~~16.00~~	~~8.00~~		0.00	~~Not Started~~	
~~20~~	~~Enable Signature from a WMB member (online tool)~~	~~General~~				0.00	~~Not Started~~	~~Requires additional discussion on feasiblity and services needed~~
21	Enable multi-part polygons or multiple polygons for a single entity	Mapping	48.00	8.00	56.00	8,960.00	Not Started	Enable multi-part polygons or multiple polygons for a single entity
22	User submitted projects under "my inflow" page	My Inflow			0.00	0.00	Not Started	
23	Maintenance: 6hrs/month * 12 months	General	144.00		144.00	23,040.00	Not Started	144hrs over a 12-month period, with hours reported on a monthly basis to be used to keep the "lights on" and ensure security patches and software updates are applied and that Inflow receives a 99.9% uptime. The effort initially excludes new feature development, requested at discretion of SMC. Bugs are resolved at no cost.

Project References

Client: Denver Mile High Flood District
Value: +$1,500,000 **Date:** December 2019 - Current
Product Description: Rapid prototyping, design, and development of a mapping platform that incorporates raster and vector data for municipal infrastructure agency and allows users to create 3D maps, collaborate with teams, and view dozens of layers on mobile and desktop.
URL: https://confluence.mhfd.org/
URL2: https://www.youtube.com/watch?v=9Bg6Ks2kxtA (client testimonial)
Keywords: React, Google Cloud (shifted to Microsoft On-Premise), REST API Development, 3D, Mapping, Mapbox, CARTO, d3.JS, Node, Python (for raster processing), Progressive App, API Optimization, Server Migration
Contact: Katie Evers, kevers@mhfd.org
Katie is a project manager and geospatial specialist who can attest our data migration efforts, API performance improvement, overall design quality and value (or freebies that Vizonomy releases as part of each task order). More than anyone else listed, Katie has had the longest relationship with our Vizonomy team. Please feel free to call her at 303-749-5416 (Denver, CO).

Client: Johns Hopkins University CCP
Value: +$380,000 **Date:** May 2021 - June 2022
Product Description: A data visualization platform conceptualized, designed, and built to assist global health policymakers understand covid perceptions and behaviors at a sub-national and national level. Considered the most comprehensive and precise analytics platform on covid for this audience. Data was updated on a bi-weekly basis until June 2022.
URL: https://covidbehaviors.org/
Keywords: React, Prototyping, User Research, Mapping, d3.js, Node, AWS Services.
Contact: Marla Shaivitz, marla.shaivitz@jhu.edu
Marla is Director of Communications at JHU and can provide a general account on our dynamic working together. From a less technical perspective, she will also emphasize our design quality and general willingness to drive the conversation with fast-paced release schedule and solid product.

Project References 2

Client: Lake County, IL
Value: $150,000 **Date:** September 2022
Product Description: Leveraging the success of the Mile High Flood District project management and spatial application, Confluence, the Vizonomy team repurposed the code to a new server environment, truncated data model, and localized spatial information. Users are able to submit a project via a mapping workflow, after which those projects are reviewed by Lake County staff.
URL: https://inflow.lcsmc.org/login
Keywords: React, React-Admin, REST API Development, 3D, Mapping, Mapbox, CARTO, d3.JS, Node, Reporting, API Optimization, Server Migration
Contact: Jeffrey Laramy, jlaramy@lakecountyil.gov
Working with Jeffrey, a database specialist, from Lake County's Stormwater Management Commission has been a sincere pleasure. Similar to Marla, Jeffrey can provide client testimony on what it is working with our team -- our general willingness to expand the initial scope at no cost and provide measurable value and results.

Client: Washington DC Department of Energy and the Environment
Value: +$300,000 **Date:** May 2019 - Current
Product Description: In 2019, Vizonomy was approached to shift the District's archaic, ESRI-based flood viewer to something cleaner, more performant, and visually appealing. The result is a desktop and mobile viewer with a crowdsourcing / form, admin portal and validation process, and real-time map layer connections along with custom graphical design, pdf reporting, and data exports.
URL: https://dcfloodrisk.org/
Keywords: GeoServer, Mapbox, D3.JS, React, Custom PDFs.
Contact: Nicholas Bonard, Nicholas.Bonard@dc.gov
Nick is a Senior Environmental Protection Specialist who can speak to Vizonomy's willingness to go beyond each scope and provide significant value, irrespective the size of the task order. As with each project reference listed (other than the COVID project, for obvious reasons), a new task order is in the pipeline with start dates between late June and early October this year.

vizonomy

INFLOW FY25

CAPITAL MANAGEMENT & PLANNING SOFTWARE

Prepared for:
Kurt Woolford
Executive Director
Stormwater Management
Commission in Lake County, IL

December 17, 2024

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