
PROPOSAL IN RESPONSE TO

RFP No. 20260257

Water Quality Trend Assessment and Dashboard Tool Development

Charlotte County, Florida

SUBMITTED BY

IVA Environmental Services

OVH Environmental Holdings LLC dba IVA Environmental Services

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Florida Certified Minority Business Enterprise

Locally Based. Deeply Experienced. Consistently Delivered.

IVA Environmental Services has served Charlotte County and the surrounding Southwest Florida region for more than 15 years. Every project delivered to the County has been completed on time and within budget. We are not a regional office of a national firm — we are a Port Charlotte company whose staff live and work in this community, with direct working knowledge of the Charlotte Harbor watershed and the agencies and programs that monitor it.

Submitted April 2, 2026

Proposal Due: 3:00 PM EST | April 2, 2026

Submitted to: Alisa L. True, CPPB, Senior Contract Specialist

4/2/2026

Charlotte County Purchasing Division
18500 Murdock Circle, Suite 344
Port Charlotte, Florida 33948

Dear Ms. True

Re: RFP No. 20260257 – Water Quality Trend Assessment and Dashboard Tool Development

IVA Environmental Services is pleased to submit this proposal to Charlotte County for the Water Quality Trend Assessment and Dashboard Tool Development project.

As a local environmental consulting firm, IVA brings a strong understanding of Charlotte County, its regional water resources, and the practical needs of public-sector environmental programs in Southwest Florida. We have served Charlotte County and surrounding counties for more than 15 years and have built our reputation on responsive service, technical rigor, and dependable project delivery. Across our county work, we have maintained a 100% record of delivering county projects on time and within budget.

For this project, IVA offers a focused team and a technically sound approach designed to produce a transparent, repeatable, and user-friendly analytical platform that supports both current needs and long-term annual updates. We understand the importance of delivering a tool that is scientifically defensible, publicly accessible, and maintainable by the County over time.

We appreciate the opportunity to submit this proposal and look forward to the opportunity to support Charlotte County on this important project.

Sincerely,
Benedict Sumah
President,
OVH Environmental Holdings LLC
dba IVA Environmental Services
bsumah@ivaenvironmental.com | 224-402-9158

SECTION I: PROJECT TEAM

IVA Environmental Services has assembled a dedicated team with complementary expertise in environmental science, data engineering, statistical analysis, geospatial processing, and interactive dashboard development. Each team member brings direct experience relevant to the core technical requirements of this project. Brief profiles are provided below; full resumes are included in the Appendix.

Benedict Sumah | Project Manager | President, IVA Environmental Services

Master's in management science & finance, Northwestern U. | BSc in Business Admin.

Background: Benedict is President of IVA Environmental Services and brings 10+ of project management experience. He serves as the primary client contact and project manager for IVA's government contracts across Florida. He has led environmental consulting engagements for Charlotte County, FDEP, and multiple municipal and county clients, with experience spanning wetland services, protected species management, GIS, and environmental data programs. His familiarity with Charlotte County's environmental programs and past projects with the county provides direct operational context for this engagement.

Role: Benedict will serve as Project Manager, responsible for client communication, meeting facilitation, schedule management, deliverable coordination, and quality control. He will serve as the single point of contact between the project team and County staff.

Nick Creixent | R Shiny Developer and Statistical Modeling Lead

MBA, IAE Business School | B.A. Economics, University of Buenos Aires

Background: Nick is a data science and analytics consultant with 18+ years of experience building data platforms, statistical models, and decision-support tools for government agencies and regulated industries. His technical skills include R Shiny application development, GAMs, Seasonal Mann-Kendall trend tests, leaflet and tmap mapping, sf and shapefile processing, iFrame deployment, and GitHub-based reproducible repositories. He has delivered end-to-end analytical solutions for public-facing and government-internal audiences across environmental monitoring, resource allocation, and longitudinal program evaluation. He is also a Professor of Analytics at the University of San Andrés.

Role: Nick will serve as R Shiny Developer and Statistical Modeling Lead. He will design and build the full R Shiny application including the interactive leaflet map, time-series and GAM visualization panels, trend summary tables, and WIN EDD upload intake workflow. He will also lead GAM model specification and output preparation, working directly with the data pipeline to ensure analytical results are structured for dashboard integration. Nick will manage the GitHub repository, implement renv dependency management, and configure iFrame deployment for the CHNEP Water Atlas.



Dmitry Solovyev | Data Pipeline Engineer and Analytics Support

MS, Statistics, Oregon State University | MPP, Public Policy, Oregon State University

Background: Dmitry Solovyev is a data analyst with 6+ years of experience delivering analytical solutions in public-sector and consulting environments. At TriMet, a regional transit agency, he built and deployed two production R Shiny applications with leaflet mapping and statistical model outputs, and architected production analytics infrastructure integrating live data feeds across 40+ routes and 13 data sources. At Oregon State University he built standardized R pipelines and longitudinal data workflows serving multiple research teams. His background in ETL design, multi-source data integration, and automated pipeline development directly supports the data acquisition and cleaning tasks required for this project.

Role: Dmitry will serve as Data Pipeline Engineer, responsible for building and maintaining the programmatic data acquisition workflow, the WIN and STORET extraction scripts, the validation gate and QA/QC routines, and the master Crosswalk Table. He will deliver a clean analysis-ready dataset for modeling and dashboard integration and will maintain the ETL layer of the GitHub repository with full documentation for annual rerun procedures.

Felix Tettey | Data Analysis and Pipeline Support Lead

MS, Public Policy, Carnegie Mellon U. | BA, Development Studies & Economics, Brown U.

Background: Felix Tettey is a senior data and analytics professional with experience leading large-scale data pipeline development, ETL design, and automated analytics workflows across government-adjacent and enterprise environments. At IMPAQ International, a research and policy consulting firm serving government agencies, he led development of publicly available analytic tools built on multi-source public datasets — directly analogous to the WIN and STORET dataset assembly required here. He has managed cross-functional analytics teams, established enterprise data governance frameworks, and built reproducible R and Python pipelines across multiple concurrent projects.

Role: Felix will support the data pipeline and analytical workflow, assisting Dmitry on ETL architecture and data governance and contributing to QA/QC process design and documentation. He will apply his government data and public-sector analytics experience to ensure the data processing framework is structured for long-term County ownership and maintainability.

Kylie Tokar | GIS Specialist and Spatial Data Lead

MS, GIS, University of Maryland | BA, Geography, University of South Carolina

Background: Kylie Tokar is a geographer and data scientist with 10+ years of experience delivering spatial analysis, cartographic products, and interactive mapping applications for government and environmental clients. Her portfolio includes field data collection applications for the US Army Corps of Engineers, urban forestry web map applications for



multiple municipalities, biodiversity geodatabases along utility rights-of-way, and interactive dashboards for public use. Her environmental services background includes spatial suitability modeling for wetland prevalence at the SC Department of Transportation.

Role: Kylie will serve as GIS Specialist and Spatial Data Lead, responsible for assembling, cleaning, and validating all spatial data assets required for the dashboard — including monitoring station coordinates, watershed and basin boundaries, and strata polygons. She will prepare and quality-control all layers using the sf package in R, delivering clean GeoJSON files structured for direct integration into the leaflet map within the R Shiny application.

Jesse Alexander | Environmental Science Reviewer

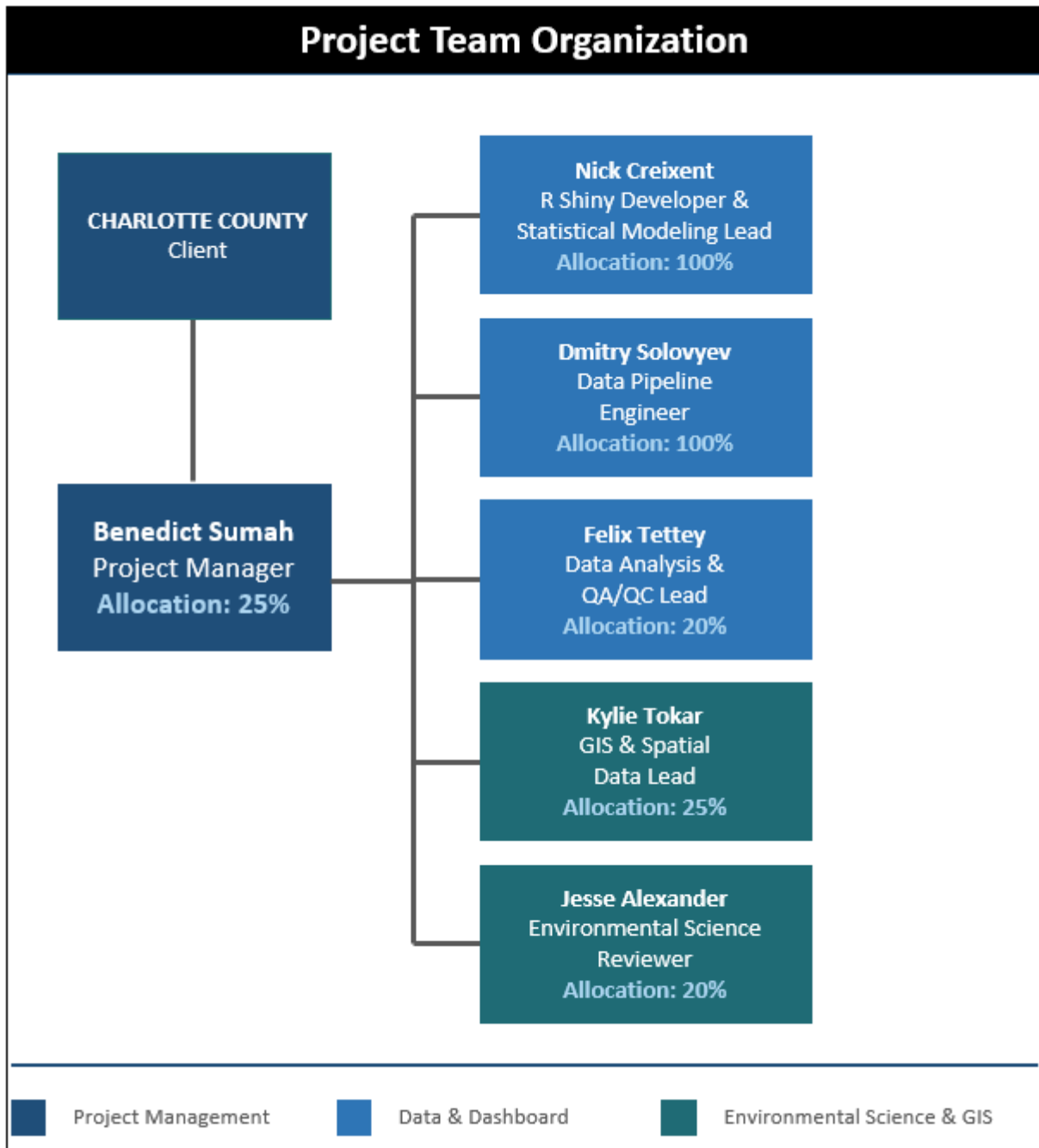
B.S. Environmental Studies (Minors: Climate Change, Geology), Florida Gulf Coast University

Background: Jesse Alexander is an environmental professional with 6+ years of experience in field-based ecological monitoring, wetland assessment, protected species evaluation, and GIS mapping. Based in Southwest Florida, Jesse has been a core member of IVA's field science team since 2019. He leads long-term water quality monitoring at Treviso Bay CDD, including field sampling, laboratory coordination, and regulatory data submission to the South Florida Water Management District — providing the team with direct operational familiarity with Florida water quality monitoring protocols, parameter conventions, and the agency submission workflows that underpin the databases this project will draw from. His undergraduate research on groundwater data analysis and ENSO-driven hydrologic patterns reflects an early grounding in the kind of long-term environmental trend analysis central to this project.

Role: Jesse will serve as Environmental Science Reviewer, contributing 20 percent of his time to the project. His primary contribution is domain knowledge — providing the data pipeline and dashboard team with working familiarity with Florida water quality monitoring field practice, WIN data structure, and the parameter and station conventions commonly encountered in long-term Southwest Florida water quality records. He will also support data QA by reviewing map layers for environmental accuracy, analytes data for validity, and consistency with field conditions.



SECTION II: TEAM ORGANIZATION



A. Team Organization Plan

IVA has structured this project around a focused technical delivery model with clear workstream ownership, defined handoff points, and a single point of accountability for client communication and schedule oversight. The organizational chart above illustrates the reporting and coordination structure.

Benedict Sumah serves as the single point of contact for Charlotte County and holds overall accountability for schedule, budget, quality, and client communication. All internal coordination flows through Benedict, who manages cross-workstream dependencies and ensures the County is never navigating multiple channels to get answers or decisions.

The technical work is organized into three parallel workstreams that converge at defined handoff points. Nick Creixent and Dmitry Solovyev lead R Shiny development and statistical modeling. Felix Tettey leads the data pipeline and QA/QC workstream, building and validating the ETL architecture and reviewing all processed datasets before they enter the modeling pipeline. Kylie Tokar leads spatial data preparation, delivering clean GeoJSON layers for dashboard integration. Jesse Alexander provides environmental science domain review at the data cleaning and trend interpretation stages, ensuring analytical decisions reflect the realities of Florida water quality monitoring practice.

The critical handoff sequence is: Felix delivers a validated, analysis-ready dataset to Nick and Dmitry; Kylie delivers clean spatial files to the Shiny development team; Jesse provides environmental science review at key analytical checkpoints. Benedict coordinates the timing of these handoffs and resolves cross-workstream dependencies before they affect the timeline. Nick and Dmitry are fully dedicated during their active task windows. Benedict, Felix, Kylie, and Jesse contribute at defined partial allocations of 25%, 20%, 25%, and 20% respectively, timed to their specific workstream phases.

B. Internal Quality Control

No deliverable goes to the County as a first draft. IVA's QA/QC process operates in two stages.

Felix Tettey serves as QA/QC Lead in addition to his data pipeline role. His review covers completeness of records against source data, correct application of the Crosswalk Table, proper handling of non-detects and flagged records, and consistency of outputs across stations and parameters. Any outputs that fail Felix's review are returned for correction before the workflow proceeds.

Benedict conducts a second-level review of all County-facing deliverables, focused on responsiveness to scope, clarity of presentation, and accuracy of interpretation. This two-stage process — Felix for technical data integrity, Benedict for scope alignment and presentation quality — ensures deliverables are both analytically sound and clearly communicated before submission.

For the dashboard, a structured internal user acceptance testing phase will be completed before the County review period begins. Testing covers all three dashboard views across multiple stations, parameters, and date ranges to confirm that filtering, chart rendering, and data refresh all function as designed. The County will always receive a stable, production-ready application for review, not a work in progress.



C. Previous Team Coordination

Benedict Sumah, Kylie Tokar, and Jesse Alexander have an active, ongoing working relationship across IVA's project portfolio in Charlotte County and Southwest Florida. Benedict manages multiple IVA's current contracts as project manager and Jesse equally has multiple projects where he is either project manager or field ecologist. Kylie supports GIS and other data asset deliverables. Felix is one of IVA's shareholders who has lend support on multiple data projects and supports data workflow design. This established coordination carries directly into this project without the ramp-up friction typical of newly assembled teams.

Nick Creixent and Dmitry Solovyev are recruited technical partners who have not previously worked with IVA. They independently built the production R Shiny applications described in Section VI — applications that replicate the exact pipeline this project requires. The division of labor between them is clean and structured around defined data handoffs rather than informal familiarity, and both have committed their availability for this engagement contingent on award.



SECTION III: PROJECT CONTROL

A. Schedule

IVA will manage schedule performance through a milestone-driven framework tied directly to the project's required deliverables: data acquisition and cleaning, trend analysis, dashboard development, review cycles, and final handoff. At kickoff, the team will establish a baseline schedule that breaks the work into task-level activities, interim technical checkpoints, client review periods, revision windows, and final delivery dates. That baseline will serve as the controlling document throughout the project and will be updated to reflect actual progress and any client comments requiring incorporation.

The primary schedule assurance technique is front-loaded planning combined with disciplined interim controls. Internal task deadlines will be set ahead of contractual due dates, creating schedule float for technical review, quality control, and comment incorporation without putting overall completion dates at risk. The team will use weekly internal status reviews to confirm completed tasks, identify bottlenecks, and reallocate effort to protect critical path items. Deliverables that depend on one another — data cleaning preceding model execution, model outputs preceding dashboard configuration — will be sequenced deliberately so that downstream work is never held up by unresolved upstream issues. Additional controls include a live task tracker with responsibility assignments by workstream, milestone confirmation at the close of each phase, and early escalation of any issues affecting data availability, source formatting, or County review turnaround.

Benedict Sumah, Project Manager, is solely responsible for assuring the schedule is met. In that role, he will oversee the project work plan, manage milestone tracking, coordinate internal resources and external partners, lead client communication, monitor cross-workstream dependencies, and make staffing or sequencing adjustments as needed to maintain schedule integrity throughout the project.

B. Cost

IVA will manage cost through a defined scope-to-budget control process that ties staff effort, task sequencing, and level of effort directly to the approved work plan. At project initiation, each task will be assigned a budgeted level of effort by team member. Actual labor usage will be tracked against planned labor on a bi-weekly basis, allowing the team to identify effort overruns before they become material and take corrective action before they affect the overall budget.

The primary cost control technique is active budget monitoring at the task level, not just at the total contract level. Each major workstream — data acquisition and cleaning, validation and



QA/QC, statistical modeling, spatial data preparation, dashboard development, documentation, and training — will be tracked independently so that variance in any single area is visible and manageable. Standardized workflows, reusable R scripts, and defined QA/QC protocols will reduce rework and maintain efficiency throughout. Because the project is built as a scripted, repeatable analytical pipeline, work products can be quality controlled and refreshed systematically rather than recreated manually — a structural cost control advantage that carries through to the annual update workflow as well.

IVA's proposed team structure supports cost control directly. Technical production is concentrated with staff dedicated specifically to analytical and dashboard tasks, while project management oversight is scaled appropriately rather than overstuffed — keeping senior involvement focused on direction, coordination, and review without burdening the budget with unnecessary overhead. The defined production sequence with internal review points limits the kind of late-stage redesign that drives avoidable budget overruns on projects of this type.

Benedict Sumah holds overall responsibility for cost control, including monitoring labor utilization against task budgets, reviewing burn rates, approving staffing adjustments, and ensuring the project remains aligned with the approved scope and fee. Task leads will monitor effort within their respective workstreams and report to Benedict, but final accountability for cost control resides with him.

C. Staff Capacity and Workload

IVA has structured the project team so that assigned staff have confirmed time and capacity to perform their designated roles without overextension. The team is organized around a focused technical delivery model, with analytical and dashboard development responsibilities held by staff who can devote concentrated effort to the work, and management oversight scaled to match the project's actual complexity.

IVA's ecological and natural resources division carries an active portfolio of field-based environmental consulting contracts across Charlotte County and the broader Southwest Florida region. This work is operationally and staffing-wise separate from the data and asset management work this project falls under. For engagements of this type, IVA works with a model of internal leads supported by pre-vetted external partners who carry confirmed availability during the project window, such that active ecological division workload has limited impact on this team's capacity.

Nick Creixent and Dmitry Solovyev are independent consultants operating on a project basis and will be **fully dedicated** to this engagement during their active task windows. Their



availability has been confirmed for the anticipated project period and is not contingent on other IVA ecological work. Full dedication on the most labor-intensive and technically demanding components materially reduces schedule risk by ensuring that data processing, model development, and dashboard implementation proceed without interruption from competing assignments.

Kylie Tokar will dedicate approximately 25 percent of her time to the project, focused on spatial data preparation and GIS deliverables timed to the dashboard development phase. Felix Tettey will dedicate approximately 20 percent of his time, supporting defined analytical and data pipeline tasks within the broader workflow. Benedict Sumah will dedicate approximately 25 percent of his time to project management — appropriate for active oversight of schedule, budget, coordination, quality review, and client communication without duplicating the technical production roles held by the core delivery team. These percentage allocations reflect phase-weighted averages; during active task windows, availability is higher. No team member is overextended at any point in the project timeline.



SECTION IV: PROPOSED PROJECT MANAGEMENT APPROACH

IVA Environmental Services approaches this project as the development of a maintainable scientific data platform rather than a static reporting product. The County is not only asking for current outputs — it is asking for a tool and codebase that can be understood, rerun, and extended as new monitoring data become available. Every technical choice described below is made in service of that goal: reproducibility, data integrity, operational continuity, and long-term County ownership of the system.

A. Data Collection

Data acquisition for this project draws from two distinct workflows reflecting the different nature of historical and ongoing water quality records.

For the historical period-of-record dataset, IVA will develop a programmatic extraction workflow to retrieve data from FDEP WIN and legacy STORET records. Where a stable API or web service is available, data will be pulled programmatically in R using packages such as `httr` and `jsonlite`, automating retrieval and reducing manual handling errors. This approach ensures that every data refresh follows the exact same logic — when the workflow is rerun in a future year, processing is identical to the baseline run. Where API access is incomplete or unavailable for specific record sets, a structured fallback workflow will be implemented using scripted imports from approved WIN and STORET export files or other standardized source formats. Building both a preferred programmatic route and a controlled fallback ensures the project remains technically sound even if source systems are uneven across agencies or time periods.

For ongoing County-generated data, the approach is straightforward. Charlotte County already prepares water quality monitoring results in the **WIN Electronic Data Deliverable (EDD) schema** as part of its standard submission workflow to FDEP. Rather than extracting that data back out of WIN after the fact, IVA will configure the dashboard's intake pipeline to accept the County's WIN EDD submission file directly. Authorized staff upload the file they are already producing — the system handles validation and processing automatically in the background. This eliminates redundant data entry, decouples dashboard updates from FDEP's publication schedule, and reduces the operational burden on County staff to near zero for routine refreshes.

Charlotte Harbor watershed water quality records span multiple sampling agencies including Charlotte County, FDEP, SFWMD, and USGS, each with their own station naming conventions, parameter codes, and reporting formats accumulated over decades of monitoring. All raw source files acquired from these agencies will be archived before



transformation, and all intermediate processing tables will be versioned. Final analysis-ready tables will be generated by script rather than manual editing, preserving a complete audit trail from source data to final analysis outputs.

B. Data Cleaning and Curation

All data will pass through a two-stage process upon acquisition: first, a validation gate at the point of intake; second, a formal QA/QC workflow applied to accepted records.

The validation gate screens every incoming record before it enters the analytical pipeline. Checks include null or empty required fields, invalid date formats, malformed station identifiers, duplicate records, schema mismatches, and values that are not physically feasible for the parameter being reported — such as negative pH, dissolved oxygen values outside realistic bounds, or nutrient concentrations inconsistent with expected reporting units. Records that fail validation are rejected and routed to an exception report for correction before the dashboard is refreshed. Catching bad records at intake rather than downstream protects the integrity of the trend analysis and prevents errors from propagating into public-facing graphics.

Records that pass the validation gate move through the formal QA/QC workflow. The first step is construction of a master Crosswalk Table that standardizes station identifiers, stratum names, analyte names, units of measure, source agency codes, dates, coordinates, and waterbody associations across all incoming data. Water quality records from Charlotte County, FDEP, SFWMD, and USGS are rarely internally consistent across agencies or decades — without a single governing schema, every downstream step is vulnerable to broken joins and inconsistent trend calculations. The Crosswalk Table resolves these inconsistencies at the source and governs all subsequent processing.

Additional QA/QC steps applied after crosswalk harmonization include:

- **Detection limit handling:** Applying consistent, documented methods for non-detect values, including substitution and censored data approaches appropriate for environmental trend analysis.
- **Outlier review and flagging:** Identifying and flagging statistical outliers for County review prior to final dataset assembly, with all disposition decisions documented.
- **Duplicate record resolution:** Distinguishing true duplicates from replicate observations and legitimate separate events, with resolution logic documented in the processing log.
- **Fatal qualifier removal:** Removing records flagged with disqualifying codes in the source database.



- **Metadata enrichment:** Appending waterbody type, basin, and strata classification to support stratified trend analysis.

All cleaning and curation decisions will be documented in a Data Processing Methods Memo delivered to the County at the conclusion of this task. A Data Inventory Report will also be delivered at the end of Month 1, giving the County early visibility into data gaps, station coverage, and record density before modeling begins — allowing the County to flag concerns before the analysis is built on top of the dataset.

The ETL architecture will maintain distinct layers for raw inputs, cleaned intermediate tables, model-ready datasets, and display-ready outputs. This separation allows County staff or future consultants to trace where any result came from, rerun only selected portions of the workflow when needed, and troubleshoot issues without dismantling the full system.

C. Trend Analysis

Before any trend modeling is applied, each station-analyte and stratum-analyte combination will be screened for data sufficiency. The screening evaluates number of observations, length of record, temporal continuity, and density of observations across the analysis window. Only datasets with adequate statistical support will be modeled. Where substantial gaps exist, predefined rules will determine whether earlier records should be excluded from the model fit or whether the series should be displayed without a modeled trend. Showing observed data without a fitted trend is more defensible than implying analytical certainty where the record does not support it, and gives dashboard users a transparent understanding of data limitations alongside results.

Trend analysis will be performed using **Generalized Additive Models (GAMs)** in R, primarily through the `mgcv` package. GAMs are well suited for this application because Charlotte Harbor watershed water quality data are shaped by seasonal cycles, storm-driven pulses, hydrologic variability, and episodic shifts that a linear model cannot represent adequately. A GAM allows the long-term trend signal to be characterized in the presence of seasonal variation rather than confounding one with the other. Model specifications will be selected to capture long-term temporal structure and, where appropriate, seasonal cyclicity. Diagnostics will be reviewed for basis sufficiency and residual behavior. Where technically appropriate, transformations such as log-scaling may be applied to stabilize variance or improve fit. Outputs will include smoothed trend curves with confidence bands, communicating both the trend estimate and the uncertainty around it.

In addition to GAM outputs, tabular trend summaries will be generated identifying trend direction, rate of change, analysis period, statistical significance, and data sufficiency status



for each station-parameter combination. Pairing graphical and tabular outputs serves different users: some will interpret the visual pattern, others will want a concise analytical summary they can reference or report against.

Sensitivity testing will be incorporated into the analytical workflow to evaluate how trend results respond to data gaps, record length, and methodological choices such as treatment of non-detects or handling of discontinuous time periods. Not all trend results are equally robust — some records will support stable interpretation while others will be more sensitive to underlying assumptions. Documenting sensitivity alongside results gives the County a more defensible basis for interpreting apparent increases or decreases and ensures that trend outputs are not presented with false equivalence across stations.

All analyses will be conducted in R using packages including mgcv for GAMs, EnvStats and trend for Seasonal Mann-Kendall, and EGRET for WRTDS where applicable. Scripts will be written for repeatability with clear inline documentation, enabling County staff or future consultants to re-run the full analysis when new data are added.

D. Publicly-Available Dashboard and Integration into the CHNEP Water Atlas

The project dashboard will be developed as an R Shiny web application, providing an interactive, publicly accessible platform for exploring water quality trends across the Charlotte Harbor watershed. R Shiny was selected to align with the County's stated preferences, to ensure the application can be maintained and extended using the same open-source R environment used for the underlying analysis, and to facilitate seamless integration with the CHNEP Water Atlas.

The dashboard will be organized around three interconnected views that guide users from spatial context through temporal analysis to interpretable results.

Station and Spatial View — the entry point. An interactive map displays all monitoring stations symbolized by trend classification — improving, degrading, no significant trend, or insufficient data — for the selected parameter. Filter controls allow users to narrow by parameter, waterbody, and strata group. Clicking a station or stratum loads that location's full analytical record into the chart panels. This map-driven entry point reflects how most public and management audiences naturally engage with environmental data: geography first, then the associated analytical story. Station locations, watershed boundaries, and strata polygons will be prepared by IVA's GIS Specialist as clean, validated GeoJSON files using the sf package in R, and rendered directly in the dashboard using the leaflet package.

Temporal View — the core analytical display. The full period-of-record time series for the



selected station and parameter is plotted as individual observations, with the GAM smooth trend curve overlaid and confidence bands showing uncertainty. A secondary panel displays the seasonal cycle — the within-year pattern extracted from the GAM — so users can clearly distinguish what is cyclical from what represents a genuine long-term shift. Users can toggle between a full period-of-record view and a rolling window such as the most recent five or ten years, supporting both long-term and near-term interpretation. All charts will be rendered using plotly, enabling users to hover over individual observations, inspect model estimates at specific time points, and zoom into periods of interest. Static ggplot2 outputs will be generated separately for inclusion in downloadable summary reports.

Trend Summary View — the results panel. A tabular summary displays trend direction, rate of change, analysis period, statistical significance, and data sufficiency status for the selected station-parameter combination. Color-coded significance indicators provide an at-a-glance read on result confidence. A downloadable summary table covering all stations and parameters is available for users who need to work with the full results set outside the dashboard.

Dashboard performance will be optimized through a precomputation strategy: statistical models and trend outputs will be calculated and stored prior to user interaction rather than computed on demand. This ensures the dashboard responds quickly even when embedded in an iFrame context where loading behavior is more constrained than in a standalone application.

The application will be integrated into the **Charlotte Harbor National Estuary Program (CHNEP) Water Atlas** using iFrame embedding. Layout, controls, legends, and responsive behavior will be designed and tested specifically for an embedded browser context from the outset. IVA will coordinate with CHNEP Water Atlas administrators to confirm iFrame compatibility, establish the hosted application URL, and test the embedded experience across common browsers and devices prior to final delivery.

For routine data updates, authorized County staff will upload the standard **WIN EDD-formatted submission file** — the same file already prepared for FDEP — through a simple administrative interface. The system performs validation, appends accepted records to the analytical dataset, and refreshes dashboard outputs automatically. No R experience, GIS knowledge, or technical skill is required of the staff member performing the update.

The application will be built for deployment in a standard hosted Shiny environment such as shinyapps.io or Posit Connect. Hosting design will be addressed during development rather than deferred to the end, so that file paths, package dependencies, data objects, and update workflows are fully compatible with the final production environment before delivery.



E. Long-Term Maintenance

IVA recommends inclusion of a 12-month post-implementation support period following final delivery. During this window, IVA will address bugs, minor adjustments, package or deployment issues, and any structural changes in FDEP WIN that affect the application's operation. This support period provides continuity during the transition from delivery to routine operational use and ensures the tool remains viable after handover rather than becoming fragile once the development team steps back.

To support long-term stability, the `renv` package will be used to lock the versions of R and all libraries used during development and deployment. R packages update frequently and can introduce breaking changes in older applications. By preserving the exact package environment used to build the application, `renv` reduces the risk of future regressions and makes the system more resilient to routine software maintenance. Where appropriate, GitHub Actions will be implemented for automated smoke testing to verify that updates to code or source data do not silently disrupt the existing processing pipeline.

All project code will be maintained in a public GitHub repository organized with clearly separated directories for raw data, cleaned data, analysis scripts, and the R Shiny application. The repository will be structured to accommodate annual updates, with a documented workflow for ingesting new WIN EDD submissions and refreshing trend results and dashboard content. Hosting all code on GitHub ensures the County retains full ownership of the system's intellectual property and that the codebase remains accessible and auditable long after project completion.

F. Training

Training will be delivered in two separate tracks to ensure each audience receives guidance matched to their actual role.

Non-technical training will focus on dashboard navigation, interpretation of trend charts and GAM outputs, and the data upload and refresh workflow. Staff who perform routine WIN EDD uploads will be walked through the full process — from exporting the submission file to confirming that the dashboard has refreshed correctly — with no technical background assumed.

Technical training will cover repository management, pipeline rerun procedures, dependency management using `renv`, troubleshooting, and deployment considerations. This track is designed for data analysts or IT staff who may need to extend or maintain the system after IVA's involvement concludes. Combining both audiences into a single session typically leaves



technical users under-served and non-technical users overwhelmed — separate tracks avoid that outcome.

G. Documentation

Documentation will be produced at three levels corresponding to different user audiences, ensuring that every person who interacts with the system has access to guidance appropriate to their role.

- **User Manual:** Written for non-technical County staff. Covers dashboard navigation, filtering, interpretation of trend charts and GAM outputs, and the step-by-step process for uploading a WIN EDD file and confirming the dashboard has refreshed correctly. No technical background assumed.
- **System Administration Manual:** Written for IT staff responsible for hosting and maintaining the application. Covers server requirements, software dependencies, deployment steps, the renv package environment, backup considerations, and procedures for handling source system changes such as WIN API structural updates.
- **Technical Workflow Guide:** Written for scientists and data analysts who may need to rerun, modify, or extend the pipeline. Covers ETL logic, validation rules, QA/QC decisions, GAM specifications, repository structure, dependency management, and rerun procedures. Includes the Data Processing Methods Memo and Data Inventory Report as appendices.

All code documentation will include inline comments explaining not just syntax but the reasoning behind methodological choices — particularly for GAM specifications, detection limit handling, and data sufficiency rules where different choices produce materially different results.

H. Kickoff and Monthly Project Team Meetings

IVA will initiate the project with a structured kickoff meeting scheduled within ten calendar days of contract execution. The Project Manager will coordinate meeting logistics, develop the agenda, and distribute materials to all County stakeholders and project team members in advance. The kickoff will confirm data access protocols, align on the WIN EDD schema, establish the master project schedule, and identify key County contacts for each task area.

Monthly project team meetings will be held on a standing schedule agreed upon at kickoff. The Project Manager will distribute a written agenda no fewer than five business days in advance. A concise meeting summary with action items and responsible parties will be distributed within three business days of each meeting. Meetings will be held virtually, with



in-person sessions available upon request. The table below summarizes the full meeting and communication cadence for the project.

Meeting / Event	Frequency / Timing	Lead	Deliverable or Outcome
Kickoff Meeting	Once — within 10 days of contract execution	Project Manager	Meeting summary, master schedule, confirmed data access protocols
Monthly Progress Meeting	Monthly — standing schedule established at kickoff	Project Manager	Meeting summary with action items and responsible parties
Data Inventory Report Review	End of Month 1	Project Manager + Data Lead	County review of data gaps and station coverage before modeling begins
Dashboard Prototype Review	Mid-project milestone	Full project team	County feedback on dashboard layout, filters, and visualization before final build
Draft Deliverable Review	Per delivery schedule	Project Manager	County comments incorporated before final submission
Final Delivery and Training	Project close	Full project team	System handover, training sessions, repository access confirmed



SECTION V: RELEVANT PROJECT EXAMPLES

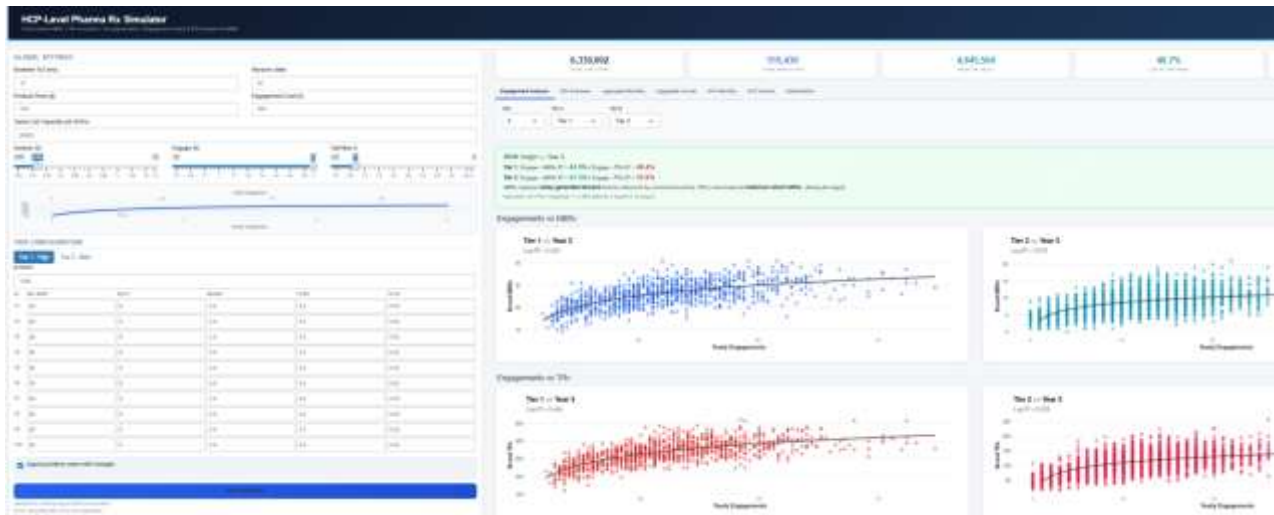
The following examples demonstrate the team's direct experience with R Shiny application development, interactive data visualization, geospatial mapping, time-series analysis, and statistical model integration — the core technical capabilities required for the Charlotte County Water Quality Trend Assessment and Dashboard Tool.

HCP Rx Simulator — Cohort-Based Sales Modeling | R Shiny | Pharmaceutical Analytics

Tools: R Shiny, Simulation Engine, Time-Series, plotly,shinyapps.io

Client: Pharmaceutical analytics team (private sector)

Live Dashboard: https://ncreixent.shinyapps.io/hcp_rx_simulator/



PROJECT OVERVIEW

This project demonstrates production-grade R Shiny development translating a complex multi-variable simulation model into an interactive, real-time decision-support tool for non-technical users. Built with a C++ simulation engine via Rcpp, the application allows users to configure market parameters — brand share, engagement levels, promotional sensitivity — and instantly visualize how cohort-based outputs compound across multi-year horizons through dynamic charts and optimization panels. The tool integrates cohort simulation, saturation-curve response modeling, regression diagnostics, and ROI optimization into a single reactive interface.

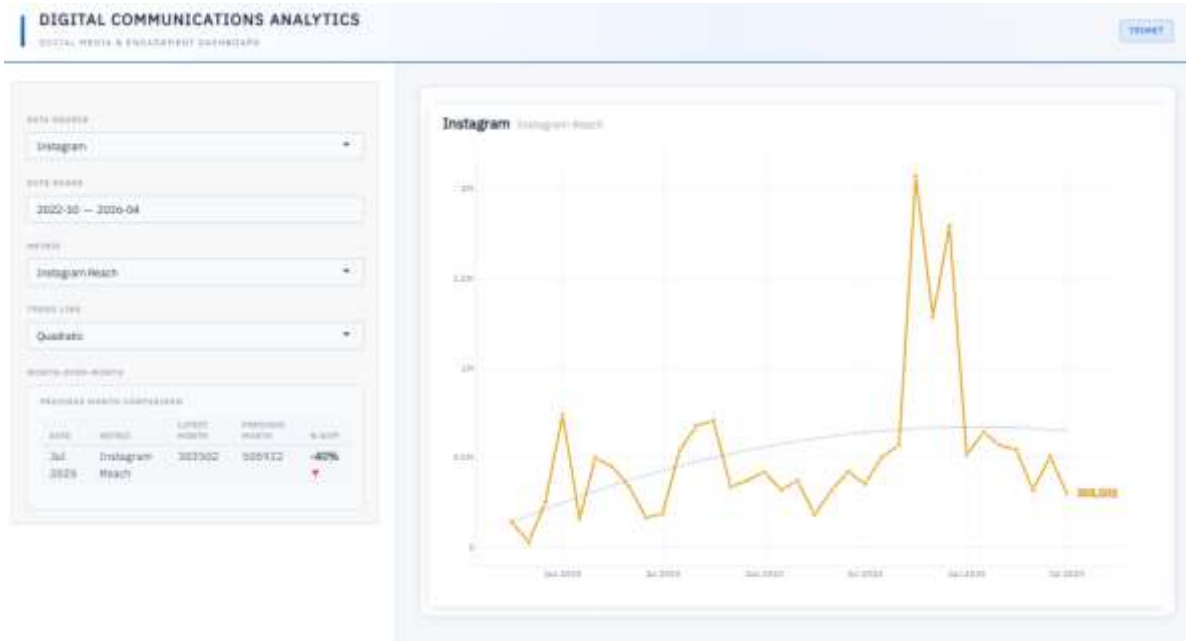
TECHNICAL RELEVANCE

The reactive architecture — where input changes propagate instantly across simulation outputs, charts, and summary panels — is directly analogous to the parameter-by-parameter, station-by-station filtering required in the water quality dashboard. The application's use of plotly for interactive chart rendering, including hover-enabled data inspection and dynamic axis behavior, maps directly to the GAM trend curve visualization with confidence bands the water quality dashboard requires.

Tools: R Shiny, plotly, Time-Series, Multi-Source ETL, Automated Pipeline, iFrame

Client: TriMet — Tri-County Metropolitan Transportation District of Oregon (public agency)

Live Dashboard: https://trimetds.shinyapps.io/DigiComm_Dashboard/



PROJECT OVERVIEW

This production R Shiny application consolidated performance metrics from 13 social media and web platforms — each with different formats, column-naming conventions, and date structures — into a single interactive dashboard for a public agency. All sources were harmonized to a consistent monthly resolution with unified column names before loading into the app. Core features include interactive plotly time-series charts with optional polynomial trend overlays fitted via `lm()`, and a month-over-month comparison table with color-coded directional indicators updated reactively on every filter change. A subsequent version integrated an automated pipeline combining API data pulls, SQL-based transformation, and Apache Airflow orchestration to refresh dashboard outputs on a monthly schedule without manual intervention.

TECHNICAL RELEVANCE

The multi-dataset filtering architecture — where a single reactive chain drives chart, table, and summary statistics from one user selection — is the same pattern driving parameter-by-parameter, station-by-station filtering in the water quality application. The **plotly** implementation maps directly to the GAM confidence interval ribbon visualization the water quality dashboard requires, where observed points, smoothed fit lines, and shaded uncertainty bands must be legible and interactive simultaneously. The application was tested

for embedding within Quarto, confirming correct iFrame rendering in an external host context — the same compatibility required for CHNEP Water Atlas integration.

TECHNICAL CHALLENGE

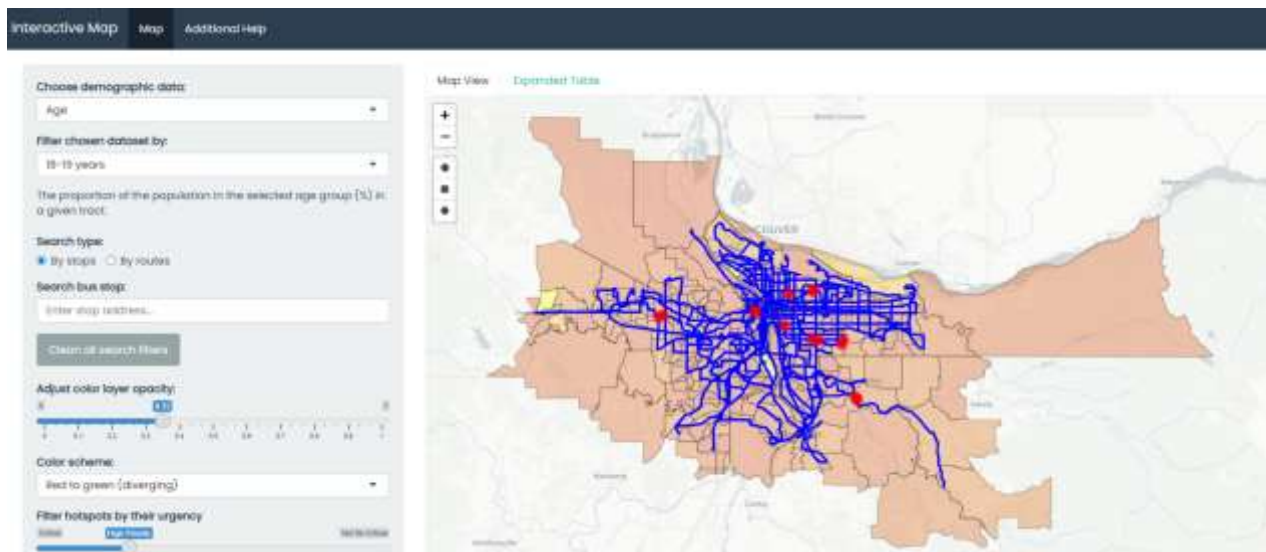
Several datasets had months with no recorded data, causing plots to draw discontinuous lines or visible gaps in trend overlays. We resolved using `zoo::rollapplyr()` with a centered 5-month window to impute missing values only where the value was NA, leaving actual observations untouched — producing smooth trend lines without distorting real data. The same approach will be applied to water quality monitoring records where stations have observation gaps within the period of record.

TriMet Stop-Level Ridership Screening Tool | *R Shiny* | *Spatial Analytics* | *Public Agency*

Tools: R Shiny, leaflet, Spatial Mapping, GLMM, Multi-Source ETL, shinyapps.io

Client: TriMet — Tri-County Metropolitan Transportation District of Oregon (public agency)

Live Dashboard: https://trimetds.shinyapps.io/interactive_hotspots_map/



PROJECT OVERVIEW

This project replicates the end-to-end architecture required for the water quality dashboard: a statistical model runs offline, outputs are structured and consumed by a Shiny application, and the dashboard visualizes predictions and classifications as an interactive spatial layer with parameter filtering — the same pipeline, a different domain. The analytical pipeline integrated five source types across approximately 8,000 bus stop locations — APC ridership records, US Census Bureau API data, OpenStreetMap network layers, land use GIS files, and internal survey exports — all joined at the stop or Census tract level, directly analogous to multi-agency WIN and STORET harmonization. The complete statistical pipeline included PCA across 26 sociodemographic variables, silhouette-optimized k-means clustering, and a



binomial GLMM with 5-fold cross-validation at AUC 0.80. The leaflet-based map was the primary user entry point, with Census tract polygon overlays, stop-level hotspot classifications across three display layers, and bus route polylines — all driving a synchronized, filterable, and downloadable data table.

TECHNICAL RELEVANCE

The map-first architecture — station selection driving all downstream chart and table outputs — is the same design specified for the water quality dashboard's spatial view. The application was deployed on **shinyapps.io** and confirmed iFrame-compatible through Quarto embedding tests, validating the deployment approach planned for CHNEP Water Atlas integration.

TECHNICAL CHALLENGE

The leaflet-Draw plugin sends circle geometries as a POINT with a radius property rather than a polygon, causing `st_intersects()` to fail silently. Resolved by detecting the feature type, transforming to a projected CRS, buffering by radius in meters using `st_buffer()`, then reprojecting to EPSG:4326 before intersecting against the stops layer — with separate branches for polygons and rectangles. This spatial selection capability can be extended to the water quality dashboard for station subsetting by watershed area.

REFERENCE:

Karen Bliss, Charlotte County | karen.bliss@charlottecountyfl.gov

Linsey Alley, Trimet | Oregon Public Transportation Agency | AlleyL@trimet.org

Lonny Nielsen, Trimet | Oregon Public Transportation Agency | NielsenL@trimet.org

Chris Glazner, Department Head Model Based Analytics, Director, and Research Director at MITRE glazner@gmail.com



SECTION VII: EXPERIENCE AND CAPABILITIES

A. Meeting Planning and Facilitation

IVA Environmental Services maintains an established practice of structured project communication with government clients across Florida, including ongoing contracts with Charlotte County. IVA's Project Manager routinely leads kickoff meetings, technical review sessions, and monthly progress meetings for county and municipal clients. Meeting management practice includes advance agenda distribution, structured facilitation, and written summaries with tracked action items — disciplines applied consistently across IVA's active project portfolio and directly transferable to this engagement.

B. Water Quality Data Processing, Cleaning, and Curation; WIN Database Experience

IVA's data pipeline team brings extensive experience in large-scale data pipeline development, including ETL process design, data governance, and automated data quality workflows applied to multi-source public datasets. Prior work includes development of publicly available analytic tools built on government data with structures comparable to the WIN and STORET records required for this project, as well as production analytics infrastructure integrating live data feeds from multiple concurrent sources. IVA's environmental science staff bring working familiarity with FDEP WIN as both data users and as consultants supporting agency clients that submit data to the system — providing practical knowledge of the EDD schema, submission workflow, and the data quality issues commonly encountered in long-term Florida water quality records from agencies including Charlotte County, FDEP, SFWMD, and USGS.

C. Nonlinear Trend Visualization Using Generalized Additive Models (GAMs)

GAM development will be led by IVA's R Shiny Developer and Statistical Modeling Lead using R's `mgcv` package, the standard implementation for environmental GAM applications. The team has applied GAMs and related nonlinear modeling approaches to characterize temporal trends in complex, multi-source monitoring datasets, producing smooth trend curve outputs with confidence intervals suitable for both technical reporting and public-facing visualization. The team brings specific experience translating GAM model outputs into interactive dashboard graphics accessible to non-specialist users, including plotly overlays that allow users to inspect model estimates and uncertainty bounds at individual time points.

D. Web-Based Dashboards Using R Shiny with iFrame Integration

IVA's R Shiny Developer has direct experience building and deploying R Shiny applications for government and public-sector clients, with a portfolio of live, publicly accessible applications available for County review. Prior dashboard work demonstrates interactive filtering, spatial



mapping via leaflet, time-series visualization, and iFrame embedding components central to this project. Representative applications include:

- TriMet Stop-Level Ridership Screening Tool — a map-driven R Shiny application with leaflet spatial mapping, GLMM statistical model outputs, multi-source ETL across five agency datasets, and confirmed iFrame compatibility via Quarto embedding tests. Live at: https://trimetds.shinyapps.io/interactive_hotspots_map/
- TriMet Digital Communications Analytics Dashboard — a production R Shiny application consolidating 13 different data sources into a single interactive time-series platform with plotly charting and automated Airflow pipeline integration. Tested and confirmed iFrame-compatible. Live at: https://trimetds.shinyapps.io/DigiComm_Dashboard/
- HCP Rx Simulator — an R Shiny application integrating a C++ simulation engine with interactive plotly visualizations and reactive multi-panel outputs for non-technical users. Live at: https://ncreixent.shinyapps.io/hcp_rx_simulator/

Full project descriptions, technical details, and relevance to this scope are provided in the Relevant Project Examples section of this proposal. The team will coordinate directly with CHNEP Water Atlas administrators to confirm iFrame compatibility and test the embedded experience prior to final delivery.

E. Sharing R Scripts and Work Products via GitHub

All project code will be maintained in a structured public GitHub repository from project initiation. This includes data acquisition scripts, validation and QA/QC routines, the master Crosswalk Table, GAM and Mann-Kendall analysis code, and the full R Shiny application. The repository will follow open-science best practices: clear directory organization, comprehensive README documentation at each level, inline code comments explaining methodological choices, and full version control throughout the project lifecycle. The codebase will be structured and documented to support annual re-execution by County staff or future consultants with minimal technical overhead, ensuring the County retains a durable, independently operable analytical system.



APPENDIX: TEAM RESUMES



Benedict Sumah

President & Project Manager — IVA Environmental Services

PROFESSIONAL SUMMARY

Environmental consulting executive and project manager with a track record of delivering complex, multi-disciplinary projects for government clients across Florida. As President of IVA Environmental Services, Benedict leads business development, client relationships, and project delivery across the firm's portfolio of environmental consulting, protected species management, wetland services, GIS, and data services contracts. He brings extensive experience managing multi-stakeholder government projects from scoping through final deliverable, with a consistent record of on-time, on-budget performance across Charlotte County and surrounding Southwest Florida municipalities.

RELEVANT EXPERIENCE

President & Project Manager | IVA Environmental Services | Port Charlotte | 2024 – Present

- Serves as President and primary project manager for IVA Environmental Services, a Florida-certified environmental consulting and data services firm
- Project Manager for active government contract portfolio, providing direct oversight of schedule, budget, scope, and client communication.
- Manages multi-disciplinary project teams combining internal staff and pre-vetted subconsultants across environmental science, GIS, data analytics, and field monitoring workstreams, representative projects
- Directs IVA's data and asset management practice, overseeing projects involving environmental data pipelines, GIS platform development, and analytical tool delivery

Engagement Manager | McKinsey & Company | Atlanta, GA | 2020 – 2024

- Served as primary liaison between technical delivery teams and clients, and translating complex systems deployments for non-technical decision-makers and ensuring alignment between project objectives and client expectations throughout delivery.
- Led multi-disciplinary client engagements across environmental services, technology, healthcare, and manufacturing sectors, managing cross-functional teams through strategy development, program design, and implementation.
- Developed program governance frameworks and management operating systems for large-scale organizational transformation initiatives.
- Led data platform and analytical tool development for, including a contract scoring platform providing real-time financial and risk assessments

Head of Customer Value Management | Millicom | 2015 – 2018

- Led commercial strategy development and cross-functional program execution for mobile internet infrastructure development and adoption in target markets.
- Managed multi-year partnerships, regulatory engagement, and financial modeling for strategic initiatives including spectrum bids and network expansion programs.

TECHNICAL SKILLS

Project Management, Stata, Python, R, GIS, Technology Translator

EDUCATION

MBA, Finance & Management Science | Kellogg School of Management, Northwestern U.



Nick Creixent

Data Science & Analytics Consultant

PROFESSIONAL SUMMARY

Data science leader with 18+ years of experience building interactive data platforms, statistical models, and decision-support tools for government agencies, multinational organizations, and regulated industries. Deep expertise in R/Shiny application development, time-series analysis, geospatial visualization, and deploying public-facing dashboards.

RELEVANT EXPERIENCE

Independent Data Science & Analytics Consultant | Jul 2022 – Present

- Design and deliver end-to-end analytical solutions including R Shiny dashboards for public-facing and internal government audiences
- Specialize in GAMs, time-series forecasting, and geospatial analytics with applications in environmental monitoring and longitudinal program evaluation
- Structure GitHub code repositories with full documentation for client maintainability

Associate Director, Business Analytics | Boehringer Ingelheim | May 2018 – Jun 2022

- Built R-based analytical tools and interactive dashboards for campaign performance monitoring and multi-channel data integration
- Designed longitudinal data pipelines for performance tracking and resource allocation
- Built resource allocation and dynamic scoring models using Bayesian methods
- Developed interactive R-based dashboards translating complex multi-source datasets into visual outputs for strategic decision-making

Regional Strategic Planning Manager | The Coca-Cola Company | Nov 2015 – Jul 2017

- Developed sustainability performance dashboards tracking water usage efficiency, waste reduction metrics, and environmental KPIs
- Designed sales forecasting using ARIMA and exponential smoothing time-series

Pricing & Economics Senior Manager | PricewaterhouseCoopers | Nov 2011 – Oct 2015

- Managed consulting engagements for government secretaries, trade policy groups, and regulatory agencies
- Led industry leading environmental impact and regulatory compliance assessments

Adjunct Professor of Marketing Analytics — University of San Andrés (2015–Present)

Adjunct Professor of Strategy and Analytics — IAE Business School (2014–2021)

TECHNICAL SKILLS

Programming: R (expert), Python, SQL

Dashboards: R Shiny, Shiny Server, shinyapps.io, iFrame deployment, Leaflet, tmap, plotly

Statistical Methods: GAMs, Seasonal Mann-Kendall, ARIMA, time-series analysis, regression, A/B testing

Geospatial: Leaflet, tmap, sf, sp, polygon processing, watershed boundary mapping

Data Engineering: Data intake workflows, ETL pipelines, GitHub-based repositories

EDUCATION

MBA — IAE Business School; B.A. Economics — University of Buenos Aires



Dmitry Solovyev

Data Scientist

PROFESSIONAL SUMMARY

Data analyst with 6+ years delivering impact across public-sector and consulting environments. Proficient in R, Python, and SQL with production experience in R Shiny dashboards, geospatial analysis, ETL pipeline architecture, and multi-source data integration. Demonstrated ability to build reproducible analytical infrastructure for government-adjacent clients.

RELEVANT EXPERIENCE

Data Analyst | TriMet Regional Transit Agency | Aug 2024 – Nov 2025

- Built and deployed two production R Shiny applications with leaflet mapping, census overlays, and statistical model outputs for marketing, IT, and spatial planning teams
- Architected production analytics infrastructure integrating live ridership feeds, rider surveys, and census data across 40+ routes and 13 data sources
- Developed stop-level ridership prediction pipeline using PCA, k-means, and GLMM
- Automated monthly analytics reporting via Airflow, integrating platform APIs, SQL, and a live R Shiny dashboard across 13 data sources

Statistical Consultant | Oregon State University | Sep 2022 – Jun 2024

- Built standardized R pipelines and longitudinal data workflows serving 10+ researchers, enabling consistent and reproducible analysis across concurrent studies
- Led end-to-end statistical design for 7+ clinical and population health studies

Data Analyst | Central Oregon FUSE | Dec 2021 – Apr 2022

- Built SQL pipelines integrating housing program data across 3 counties for real-time performance monitoring
- Applied causal inference methods (PSM, DiD) for evidence-based impact reporting

Data Analyst | Center for Advanced Governance | Sep 2018 – Dec 2021

- Built a cross-sector data system integrating 300K+ records from 9 agencies using SQL and Python
- Translated analytical findings into large-scale initiatives adopted at the federal level

TECHNICAL SKILLS

Languages: R (tidyverse, lme4), Python (pandas, NumPy, scikit-learn), SQL (PostgreSQL, BigQuery, Snowflake)

Infrastructure & ETL: Airflow, GCP, Git, dbt

Modeling: Time-series (ARIMA, SARIMAX, Prophet), GLMs/GLMMs, causal inference, A/B testing

Visualization: R Shiny, Tableau, ArcGIS, Quarto

EDUCATION

MS, Statistics — Oregon State University

MPP, Public Policy — Oregon State University

BA, Political Science — Moscow State University



Felix Tettey

Data Analysis and Pipeline Support Lead

PROFESSIONAL SUMMARY

Senior data and analytics professional with experience leading large-scale data pipeline development, ETL design, and automated analytics workflows across government-adjacent and enterprise environments. Track record building publicly available analytic tools on multi-source public datasets, managing cross-functional analytics teams, and delivering reproducible R and Python pipelines for government agency clients.

RELEVANT EXPERIENCE

Director, CX Data, Insight & Analytics | Tosca Services | Apr 2025 – Present

- Defined and operationalized enterprise data strategy, designing standard KPIs and governance frameworks improving data quality and actionability across all customers
- Led forecasting transformation replacing manual workflows with automated, data-driven pipelines

Senior Manager, Business Analytics & Strategy | Angi Inc. | Mar 2022 – Apr 2025

- Partnered with Data Engineering to establish and maintain ETL processes integrating third-party software data into enterprise data warehouse
- Established best practices for analytics to extract and communicate actionable insights from raw data
- Led standardization of enterprise business metrics across two previously independent companies

Manager / Project Manager, International CX Insight | Delta Air Lines | Feb 2020 – Mar 2022

- Reduced reporting time by 90% through automation of reporting workflows using R and Python
- Synthesized complex analytical findings into intuitive communication for non-technical audiences

Product Development Manager | IMPAQ International (subsidiary of AIR) | Sep 2017 – Jan 2020

- Led development of three publicly available analytic tools enabling census-tract-level analyses on social determinants of health for government agency clients
- Developed Python program automating 90% of a manual federal compliance review process
- Managed proposal development for technical government RFPs

TECHNICAL SKILLS

Languages: Python, R, SAS, Stata, SQL

Platforms: Tableau, Power BI, Salesforce, Teradata, Snowflake, Looker

Methods: ETL design, data governance, statistical analysis, consumer insights

EDUCATION

MS, Public Policy & Management — Carnegie Mellon University, H. John Heinz III College

BA, Development Studies (Honors) & Economics — Brown University



Jesse Alexander

Ecologist & GIS Specialist

PROFESSIONAL SUMMARY

Environmental professional with 6+ years of experience in field-based ecological monitoring, wetland assessment, protected species evaluation, and GIS mapping. At IVA Environmental Services, Jesse has led long-term water quality monitoring programs including sampling and data submission to SFWMD — providing direct operational familiarity with the regulatory data submission workflows and parameter conventions that underpin Florida's water quality monitoring infrastructure.

RELEVANT EXPERIENCE

Ecologist & GIS Specialist | IVA Environmental Services | Port Charlotte | 2019 – present

- Leads long-term water quality monitoring at Treviso Bay CDD, including field sampling, regulatory data submission to the South Florida Water Management District (SFWMD)
- Conducts wetland delineations and jurisdictional determinations with U.S. Army Corps of Engineers methodology, adopting National Wetlands Inventory databases
- Performs protected species assessments and surveys for federally and state-listed species
- Creates detailed technical maps using ArcGIS and AutoCAD/Civil 3D for environmental assessments, wetland boundaries, and protected species habitats
- Conducts comprehensive environmental database reviews for development and real estate projects, including federal and state regulatory databases
- Delivers environmental site assessments, development suitability analyses, and regulatory compliance reports for clients including developers and municipalities
- Specialize in GAMs, time-series forecasting, and geospatial analytics with applications in environmental monitoring and longitudinal program evaluation
- Structure GitHub code repositories with full documentation for client maintainability

TECHNICAL SKILLS

Programming: R (expert), Python, SQL

Dashboards: R Shiny, Shiny Server, shinyapps.io, iFrame deployment, Leaflet, tmap, plotly

Statistical Methods: GAMs, Seasonal Mann-Kendall, ARIMA, time-series analysis, regression, A/B testing

Geospatial: Leaflet, tmap, sf, sp, polygon processing, watershed boundary mapping

Data Engineering: Data intake workflows, ETL pipelines, GitHub-based repositories

EDUCATION

- Bachelor of Science, Environmental Studies with minors in Climate Change & Geology
Florida Gulf Coast University, Fort Myers, FL | 2019
- Undergraduate research: groundwater data analysis and its relationship to hurricane impacts and El Niño Southern Oscillation (ENSO) patterns



Kylie Tokar

Geographer & Data Scientist

PROFESSIONAL SUMMARY

Geographer and data scientist with a Master's in GIS and a decade of experience delivering spatial analysis, cartographic products, and interactive mapping applications for government and environmental clients. Kylie specializes in environmental and public-sector geospatial data, web map application development, and spatial data pipeline design. Presented at the Esri User Conference 2025.

RELEVANT EXPERIENCE

Geographer & Data Scientist | Kylie Tokar LLC | Jan 2021 – Present

- Build complex cartographic dashboards, databases, and visualizations for environmental, public, and government clients
- Configured and tested mobile data collection applications for the US Army Corps of Engineers for invasive species field mapping
- Developed field application and database for utility technicians to gather environmental site data for year-to-year species richness reporting
- Managed complex tree and urban forestry data for multiple municipalities, building user-friendly web map applications with filter, search, and export capabilities
- Produced detailed geodatabases documenting species habitats, protected lands, and potential project sites along utility rights-of-way
- Built nationwide soil risk and erosion models for solar site selection using environmental risk factors

Analytic Project Lead | Maxar Technologies | Jun 2017 – Apr 2023

- Led development of advanced R&D land cover products and feature extraction models from high-resolution satellite imagery
- Supported government customers with geospatial visualization, model-building, and statistical expertise

Environmental Services Assistant | SC Dept. of Transportation | May 2016 – Aug 2016

- Assisted in development of a spatial suitability model for predicting wetland prevalence
- Participated in field delineation of environmental regions

TECHNICAL SKILLS

Geospatial (R/Web): sf, PostGIS, PostgreSQL, Leaflet, GeoJSON, TopoJSON, ArcGIS, QGIS

Programming: Python (geospatial), JavaScript, HTML, CSS, SQL

Visualization: Tableau, data visualization, web app development

EDUCATION

MS, GIS — University of Maryland (2019)

BA, Geography — University of South Carolina (2016)

SPEAKING

Esri User Conference 2025 | Esri FedGIS 2023 | International Conference on Ocean Energy 2021 | GEOINTegration Summit 2019



Data Scientist consultant with 10+ years of experience leading end-to-end analytics projects to solve complex data problems for a better world. Expertise in R, Python, SQL, and communicating insights to non-technical audiences.

TECHNICAL SKILLS

- **Data Analytics**
- **Data Visualization**
- **Client Advising**
- **Machine Learning/AI**
- **Statistics**
- **Health Data (EHR & Claims)**

Highly Proficient:R (dplyr, tidyverse), R Shiny, Python (Pandas, NumPy), SQL/PostgreSQL, Tableau, MATLAB, ETL, Excel
Working Knowledge of: Natural Language Processing (NLP), Data de-identification, ICD/CPT codes, Geospatial analysis, Git, PowerBI, Simulation, D3 (Javascript), Scalable computing, Cloud-based data platforms, Java, C, PowerApps
Other Skills: Scientific report writing/presentations; Sponsor/client interactions and advising; Project development; Requirements development; Microsoft Office & Sharepoint; Clinical Electronic Health Record (EHR) and Claims data; Real-world data/evidence (RWD/RWE); Public Data Sources; Government data; LEAN Eng.; Agile development; APIs

EDUCATION

Georgia Institute of Technology, Atlanta, GA

Master of Science in Analytics 2019

Princeton University, Princeton, NJ

Bachelor of Science in Engineering, Operations Research and Financial Engineering 2016

Minors: Engineering and Management Systems; Applications of Computing; Finance

Thesis: Evaluating the Implementation of an Emergency Department Fast Track using Modeling and Simulation

PROFESSIONAL EXPERIENCE

Data Insights by Kristin Fitzgerald LLC, Blacksburg, VA & Remote

Principal Consultant 2025 – Present

- Provide consulting services that turn data into meaningful insights using a breadth of analytics including ML/AI.

The MITRE Corporation

Lead Data Scientist, Model-Based Analytics, *Remote (Blacksburg, VA)* 2021 – 2025

Senior Data Scientist, Model-Based Analytics, *Bedford, MA* 2019 – 2021

Data Scientist, Model-Based Analytics, *Bedford, MA* 2016 – 2019

- Led and managed distributed teams of analysts and subject matter experts in performing analysis for clients.
- Collaborated directly with government sponsors and provides expertise on defining the problem space and analytical requirements, developing sustainable analytic plans, and implementing impactful solutions for a variety of use cases.
- Delivered briefings on methodology and insights to government sponsors, supporting high-level decision-making.
- Leveraged SQL, R, Python, Tableau and other data science tools to provide data analysis, visualization, and models across multiple sources, synthesizing results for stakeholders with varying technical experience.
- Provided analysis documentation and information for future use of products (i.e. installation and use guides).
- Project topics included: Veteran benefits; epidemiological modeling; evaluation of COVID-19 therapeutics; opioid abuse and overprescribing; domestic violence assistance; federal decision support and reporting; federal acquisitions (USA Spending); geographic modeling of endangered species. See selected publicly-released projects on page 2.
- Received 31 internal awards (9 requiring director or VP approval) including MITRE's highest project honor.

UMass Memorial Medical Center, Worcester, MA

Intern, Systems Engineering/Business Intelligence 2014 – 2016

- Studied hospital patient flow and operations and evaluated solutions to minimize waste using Tableau and Excel VBA with clinical EHR data for the Center for Innovation and Transformational Change.

Princeton University, Princeton, NJ

[McGraw Center for Teaching and Learning](#), Learning Strategies Consultant / Tutor 2015 – 2016

[Office of Information Technology \(OIT\)](#), Upperclassman Student Technology Consultant 2013 – 2016

CDC Data Science Upskilling (DSU) Technical Advising - MITRE

2023 – 2024

Program Overview: <https://www.cdc.gov/phifp/php/our-work/data-science-upskilling-program.html>

- Provided technical advising support for two cohorts of CDC DSU capstone projects (over twenty teams).
- Provided expertise in problem definition, analytic methodologies, and implementation for the program duration.

Real World Evidence to Accelerate COVID-19 Therapeutics - MITRE

2021 – 2024

GitHub Repository: <https://github.com/mitre/covid19-mabs-rwe>

- Managed the modeling team that conducted a real-world clinical observational study of the safety and effectiveness of Monoclonal Antibodies (mAbs) to fight SARS-CoV-2 using R and Python, in partnership with several health systems.
- Received several internal awards including the Program Recognition Award, MITRE's highest project honor.

D. Stein **et al.**, "A compound representation of the multiple treatment propensity score with applications to marginal structural modeling", *Epidemiologic Methods*, vol. 13, no. s2, p. 20230005, 2024. <https://doi.org/10.1515/em-2023-0005>

N. Ambrose **et al.**, "The influence of social determinants on receiving outpatient treatment with monoclonal antibodies, disease risk, and effectiveness for covid-19", *Journal of general internal medicine*, vol. 38, no. 16, pp. 3472–3481, 2023.

<https://doi.org/10.1007/s11606-023-08324-y>

N. Ambrose **et al.**, "Neutralizing monoclonal antibody use and COVID-19 infection outcomes", *JAMA Network Open*, vol. 6, no. 4, pp. e239694–e239694, 2023. <https://doi.org/10.1001/jamanetworkopen.2023.9694>

The Fight is in Us COVID-19 COVID Convalescent Plasma (CCP) Campaign - MITRE

2020 – 2021

- Worked directly with the sponsor to build and update an interactive dashboard with COVID-19 data and simulation results to guide decision-makers on where to target their CCP collection campaign.
- Over 7 mil. website visits generated more than 100k donation referrals; CCP estimated to have saved 30-40k lives.
- Received Breakthrough Award for exemplary contributions to our nation's fight against the COVID-19 pandemic.
- <https://newsnetwork.mayoclinic.org/discussion/calling-all-covid-19-survivors-now-you-could-help-others-defeat-it/>

COVID-19 Health Care Coalition (C19HCC) - MITRE

2020

R Shiny Dashboard GitHub Repository: <https://github.com/c19hcc/c19-modeling-tools>

- Led the rapid development of various analytical tools, decision support dashboards, and models (e.g. SEIR simulation) using R, R Shiny, Python, and Javascript to assist epidemiologists, health policy experts, and decision-makers.
- The C19HCC decision support dashboard was visited over 14K times by over 6000 unique users from 38 states.
- Received Trailblazer Award and two Catalyst Awards for rapid support of the nation's COVID-19 pandemic response.
- Directly supported the data collection and visualization work publicly documented in this paper by my colleagues: Tolk, A., Glazner, C., & Ungerleider, J., "Computational Decision Support for the COVID-19 Healthcare Coalition", *Computing in science & engineering*, 23(1), 17–24, 2020. <https://doi.org/10.1109/MCSE.2020.3036586>

New Hampshire Opioid Overprescribing and Misuse Project - MITRE

2018 – 2019

- Performed data analysis to identify trends of opioid overprescribing and misuse using prescription drug monitoring program (PDMP) data using R, SQL, and Python.
- Received Catalyst Award for technical excellence and impact in identifying trends in opioid overprescribing in NH.
- News article: <https://www.seacoastonline.com/story/news/2019/01/11/nh-turns-to-data-to/6328375007/>

Evaluating the Use of Public Data Sources to Improve Acquisition Processes - MITRE

2017 – 2019

- Explored, developed and evaluated data-driven methodologies and solutions to common challenges in federal acquisitions by leveraging publicly-available, but difficult to access, acquisition data using SQL and R.

D. L. Lasalle and K. Fitzgerald, "Evaluating The Use Of Public Data Sources To Improve Acquisition Processes: A Market Research Use Case", 2019. <https://dair.nps.edu/handle/123456789/1748>

Evaluating the Implementation of an Emergency Dept. Fast Track using Modeling and Simulation

2015 – 2016

Princeton University Thesis Research and Partnership with UMass Memorial Medical Center

- Studied the impact on patient wait times and nursing resource demand from the addition of a fast track in the emergency department using clinical data in a queue-based Monte Carlo simulation in MATLAB.

K. Fitzgerald, L. Pelletier, and M. A. Reznick, "A Queue-Based Monte Carlo Analysis to Support Decision Making for Implementation of an Emergency Department Fast Track", *Journal of healthcare engineering*, vol. 2017, no. 1, p. 6536523, 2017.

<https://doi.org/10.1155/2017/6536523>

**PART IV - SUBMITTAL FORMS
PROPOSAL SUBMITTAL SIGNATURE FORM**

1.	Project Team Name and Title	Years experience	City of office individual will work out of for this project	City individual's office is normally located	City of individual's residence
	Benedict Sumah	15	Port Charlotte	Port Charlotte	Port Charlotte
	Jesse Alexander	7	Port Charlotte	Port Charlotte	Bokeelia
	Kylie Tokar	10	Remote	Pittsburg	Pittsburg
	Felix Tettey	9	Remote	Atlanta / Port Charlotte	Atlanta / Port Charlotte
	Dmitry Solovyev	8	Remote	Oregon	Oregon
	Nick Creixent	15	Remote	Ridgefield, CT	Ridgefield, CT
	Kristin Fitzgerald	11	Remote	Blacksburg, VA	Blacksburg, VA
2.	Magnitude of Company Operations				
	A) Total professional services fees received within last 24 months:			\$ 3,400,000.00	
	B) Number of similar projects started within last 24 months:			3	
	C) Largest single project to date:			\$ 280,000	
3.	Magnitude of Charlotte County Projects				
	A) Number of current or scheduled County Projects			1	
	B) Payments received from the County over the past 24 months (based upon executed contracts with the County).			\$ 168,000	
4.	Sub-Consultant(s) (if applicable)	Location	% of Work to be Provided	Services to be Provided	
5.	Disclosure of interest or involvement: List below all private sector clients with whom you have an active pending contract and who have an interest within the areas affected by this project. Also, include any properties or interests held by your firm, or officers of your firm, within the areas affected by this project.				
	Firm N/A	Address			
	Phone #	Contact Name			
	Start Date	Ending Date			
	Project Name/Description				

NAME OF FIRM OVH Environmental Holdings LLC d/b/a IVA Environmental Services
(This form must be completed and returned)

6. Minority Business:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
The County will consider the firm's status as an MBE or a certified MBE, and also the status of any sub-contractors or sub-consultants proposed to be utilized by the firm, within the evaluation process.	
Comments or Additional Information:	

The undersigned attests to his/her authority to submit this proposal and to bind the firm herein named to perform as per contract, if the firm is awarded the Contract by the County. The undersigned further certifies that he/she has read the Request for Proposal, Terms and Conditions, Insurance Requirements and any other documentation relating to this request and this proposal is submitted with full knowledge and understanding of the requirements and time constraints noted herein.

By signing this form, the proposer hereby declares that this proposal is made without collusion with any other person or entity submitting a proposal pursuant to this RFP.

In accordance with section 287.135, Florida Statutes, the undersigned certifies that the company is not on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, and does not have business operations in Cuba or Syria (if applicable) or the Scrutinized Companies that Boycott Israel List, or is not participating in a boycott of Israel.


As Addenda are considered binding as if contained in the original specifications, it is critical that the Consultant acknowledge receipt of same. The submittal may be considered void if receipt of an addendum is not acknowledged.

Addendum No. 1 Dated 3/23/26 Addendum No. _____ Dated _____ Addendum No. _____ Dated _____
 Addendum No. _____ Dated _____ Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

Type of Organization (please check one): INDIVIDUAL CORPORATION PARTNERSHIP JOINT VENTURE

<u>OVH Environmental Holdings LLC</u>	<u>224-402-9158</u>
Firm Name	Telephone
<u>IVA Environmental Services</u>	<u>99-201-4613</u>
Fictitious or d/b/a Name	Federal Employer Identification Number (FEIN)
<u>22102 Kimble Ave</u>	<u>16</u>
Home Office Address	Number of Years in Business
<u>Port Charlotte, FL 33952</u>	
City, State, Zip	

Address: Office Servicing Charlotte County, other than above

<u>Benedict Sumah</u>	<u>224-402-9158</u>
Name/Title of your Charlotte County Rep.	Telephone
<u>Benedict Sumah, President</u>	
Name/Title of Individual Binding Firm (Please Print)	
	<u>4/2/2026</u>
Signature of Individual Binding Firm	Date
<u>bsumah@ivaenvironmental.com</u>	
Email Address	

(This form must be completed & returned)

DRUG FREE WORKPLACE FORM

OVH Environmental Holdings LLC
d/b/a IVA Environmental Services
(name of business)

The undersigned vendor in accordance with Florida Statute 287.087 hereby certifies that
does:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm complies fully with the above requirements.



Proposer's Signature

4/2/2026

Date

NAME OF FIRM OVH Environmental Holdings LLC d/b/a IVA Environmental Services

(This form must be completed and returned)

**HUMAN TRAFFICKING AFFIDAVIT
for Nongovernmental Entities Pursuant To FS. §787.06**

Charlotte County Contract #20260257

The undersigned on behalf of the entity listed below, (the "Nongovernmental Entity"), hereby attests under penalty of perjury as follows:

1. I am over the age of 18 and I have personal knowledge of the matters set forth except as otherwise set forth herein.
2. I am an officer or representative of the Nongovernmental Entity and authorized to provide this affidavit on the Company's behalf.
3. Nongovernmental Entity does not use coercion for labor or services as defined in Section 787.06, Florida Statutes.
4. This declaration is made pursuant to Section 92.525, Florida Statutes. I understand that making a false statement in this declaration may subject me to criminal penalties.

Under penalties of perjury, I declare that I have read the foregoing Human Trafficking Affidavit and that the facts stated in it are true.

Further Affiant sayeth naught.



Signature

Benedict Sumah

Printed Name

President

Title

OVH Environmental Holdings LLC
d/b/a IVA Environmental Services

Nongovernmental Entity

4/2/2026

Date

END OF PART IV

NAME OF FIRM OVH Environmental Holdings LLC d/b/a IVA Environmental Services

(This form must be completed and returned)

State of Florida

Minority Business Certification

IVA Environmental Services

Is certified under the provisions of
287 and 295.187, Florida Statutes, for a period from:

11/14/2024 to 11/14/2026



Pedro Allende
Florida Department of Management Services

