STATEMENT OF WORK for the
Coastal & Heartland National Estuary Partnership
CHNEP Water Atlas FY20 Maintenance Project

October 1, 2019– September 30, 2020

OBJECTIVE

The purpose of Water Atlas FY20 Maintenance Project is to maintain the Coastal & Heartland National Estuary Partnership CHNEP Water Atlas for a period of 12 months, enhance portions of the website as desired by CHNEP staff including additional data, reduce long-term maintenance costs by continuing the consolidation of CHNEP and other Water Atlas projects into a single back-end data management system and website application, and improve the design of the home page and new applications for the CHNEP Water Atlas. The deliverable product is the maintenance of a fully functional web site for CHNEP staff and citizens to use for a period of 12 months, during which time data will be updated on the Water Atlas, and the applications will be upgraded as indicated below. The project budget is based on University of South Florida Water Institute (USF) costs and the required 25% overhead for all centers within USF sponsored research system and is provided for each task. The Water Atlas also assists CHNEP with compliance with state and federal objectives relating to facilitating public access to scientific data.

INTRODUCTION

During FY 2011, CHNEP contracted with USF to develop a CHNEP Water Atlas. The purpose of the CHNEP Water Atlas is to provide a single source of water resource data using existing information management technologies in a citizen-friendly interface. The CHNEP Water Atlas is a web-based, data (spatial and non-spatial) and information management and visualization system that supports the realization of CHNEP water quality, hydrology, habitat quantifiable, and stewardship gap objectives. It makes water resource and supporting data available to a maximum number of people in an efficient and cost-effective manner. The document catalog section provides historical and management information related to water resources, as well as current events. And, it provides a geographic interface for citizens to have access to a vast number of water resource related geographic information map layers, such as parks, environmental lands, recreation sites and others. The technologies used to develop the CHNEP Water Atlas include: Microsoft SQL Server, ESRI ArcIMS and ArcGIS Server, and Microsoft Internet Information Server. The datasets used include: a hydrographic GIS base map of all water bodies; parametric data (e.g., water quality, hydrology, etc.) related to these water bodies; a corresponding sample site GIS map to allow parametric datasets to be accessible; and a watershed/basin GIS map used to organize basin information, as well as aerial photographs and educational documents related to water resources. There are water resource pages for each of the eight CHNEP estuary segments. The management of CHNEP's water resources requires an informed citizenry and the cooperation of multiple government agencies and the CHNEP Water Atlas serves as a primary tool for assisting the citizens, scientists, and community leaders to manage water resources in CHNEP study area. The CHNEP Water Atlas is now fully operational.

PROPOSED PROJECT WORKPLAN

All updating, revision, maintenance and support efforts that will ensure the CHNEP Water Atlas is available and fully functioning are included in this project. The level of service is for 12 months and is comprised of all the services required to maintain and update the Water Atlas based on the One Atlas framework. Two general tasks are included. The first task, Basic Level of Services, ensures update and maintenance of the common databases held for One Atlas applications and the basic functionality of the One Atlas website and toolsets. Efforts expended towards these services are funded equally by all Water Atlas partners. The second task, Standard Level of Services, adds additional services that are required to ensure the unique nature of the CHNEP Water Atlas website and to maintain unique datasets that a partner requires for this maintenance. **Note:** The Basic Level of Service Task is written as a standalone task, but for most Water Atlas projects, the assumption is that full support (addition of a Standard Level of Service) is provided. Efforts expended towards these services are funded equally by all Standard Water Atlas partners.

TASK 1: Basic Level of Services

Wherever possible, the Water Atlas application is designed to update water quality, hydrology, and other data using automated database tools. So long as each data provider continues to support the automated data update protocols developed for the Water Atlas, USF will ensure that these tools continue to provide updated data for the duration of this contract. USF will work with CHNEP to incorporate additional data/data providers, and with existing data providers to periodically update/edit sample site locations of existing data providers to allow new data to be accessible via the web interface. Data update frequency will be scheduled to match as closely as possible the update frequency of the data provider based on historical data. For example, during the past few years data have been uploaded to STORET only once or twice per year by many agencies. The Watershed Information Network (WIN) is the successor to the Florida Department of Environmental Protection's STORET database. Further uploads to STORET are closed and it is now a legacy dataset. STORET data sources will be replaced by their WIN equivalents as data become available. Except as noted in Tables 1 and 2, USF will update data on the Water Atlas only once per year for most WIN data sources and biannually for others. It is important to note that these data updates are scheduled to provide the most timely updates but at a reduced cost to the project. Table 1 indicates the primary datasets currently included as part of the Basic Level of Services Water Atlas project. These data sources are maintained for all coastal water atlas partners.

In addition to GIS and parametric data, the Water Atlas is also designed to include numerous electronic documents and links to other websites. With limited assistance from USF, CHNEP staff or designates will be responsible for maintaining the published documents and links on the Water Atlas using the password-protected, web-based Water Atlas administration section (WRAD-CMS). Also, CHNEP staff will be responsible for accepting and replying to most email received via the Water Atlas relative to inquiries about the Water Atlas contents. However, USF will respond to email comments related to the technology behind the Water Atlas, such as reports of bugs or errors. CHNEP may, at their discretion, share these responsibilities with staff from partner government agencies.

All of the Water Atlas projects hosted at USF share in the hardware, software, and other associated costs such as new technology or components. The advantage of this system is reduced costs of Water Atlas web hosting for all Water Atlas partners. This component includes:

Shared Site Software Maintenance Costs: USF will maintain all software necessary to ensure that the web interface is online and accessible to the public. Software licenses to be maintained as part of this task include: Microsoft SQL 2000 or higher, Microsoft Web Services and .NET, ESRI ArcIMS and ArcSDE, a web statistics software package, and other miscellaneous software.

Shared Site Hardware Maintenance Costs: USF will also provide hardware necessary to complete this task. Hardware requirements necessary to ensure that the Water Atlas will be available to all users with reasonable access times and minimal downtime have been planned according to projected demands. However, these demands may change due to increased or decreased user demand and will be evaluated on a yearly basis. Currently, this task is accomplished by serving the Water Atlas web interface from servers located at USF. However, if necessary, USF reserves the right to serve the Water Atlas from servers not located at USF.

Water Atlas Application Maintenance: USF is constantly in the process of improving, upgrading and actively managing Water Atlas projects throughout the State of Florida. All of the Water Atlas projects hosted at USF share in the new component development and component upgrades as well as upgrades to web technology. This sharing of components and web technology leads to a reduced costs of Water Atlas updates and program improvements for all Water Atlas Partners.

Web Management and Statistics: USF will function as web manager for the Water Atlas. USF will provide password-protected access to web usage statistics, including number of users, number of web page requests, and other standard web statistic metrics. In addition, USF will provide an online Web Usage Report which will include common website usage statistics as well as statistics related to number of data records or sample locations added, number of email requests received, and number of photos or documents entered.

Software Fixes and Upgrades: During the annual contract period, USF will likely make modifications to existing functionality as part of contractual agreements with other project partners. Whenever feasible, USF will implement these changes to all Water Atlas projects at no additional charge to CHNEP.

Project Management: Project Management: Invoices will be sent each quarter and one annual report which summarizes the work conducted during the period of performance, and includes the work effort, data uploads, site usage and upgrades completed during the 4th quarter will be sent at the end of the contract period. Project Management services will include travel to project meetings; travel to maintain staff proficiency and travel to present information or findings regarding the Water Atlas project at water resource related conferences.

Task 1 Cost: $26,000

Task 1 Deliverables:

- Data Management – Maintenance of all data sources listed in Table 1 for 12 months, including the uploading of new data.
- Site Updates, Revisions and Maintenance – Monthly site revisions to remove, revise, update or add content as directed by CHNEP staff, as well maintenance and web hosting and component upgrades a necessary for 12 months.
- Annual Report – The report will summarize work effort, data uploads, site usage and upgrades, travel conducted for the entire project period and will include text on activities occurring in the 4th quarter.

Table 1. Basic (Water Atlas) Spatial and Non-Spatial Data Sets

Data Source	Data Source Name	Data Type	Update
FDEP and USEPA Impaired Waters and WBID Boundaries		GIS/DB	Annually
FNAI Managed Lands		GIS/DB	Annually
Land Use/Land Cover		GIS/DB	Annually
Sampling Locations		GIS/DB	As scheduled
Waterbody Additions and Modifications		GIS/DB	When Needed
COMPS	Coastal Ocean Monitoring & Predication System	Parametric Data	Near real-time
DACS_WQ	Shellfish Environmental Assessment Data	Parametric Data	Legacy
FDEP_PLANTS	FDEP Aquatic Plant Survey	Parametric Data	Legacy
IFAS_FAWN	Florida Automated Weather Network	Parametric Data	Near real-time
LAKEWATCH_V	LAKEWATCH Volunteer Water Quality Data	Parametric Data	Annually
LEGACYSTORET_1113S050	USEPA Region 4	Parametric Data	Legacy
LEGACYSTORET_1114PEST	Legacy STORET for USEPA Region 4	Parametric Data	Legacy
LEGACYSTORET_11EPALES	Legacy STORET for USEPA	Parametric Data	Legacy
LEGACYSTORET_11NPSWRD	Legacy STORET for EPA National Parks Service Water Resource Division	Parametric Data	Legacy
LEGACYSTORET_21FLA	FDEP Historic Data from Legacy STORET	Parametric Data	Legacy
LEGACYSTORET_21FLGFWF	FFWCC Legacy STORET Data	Parametric Data	Legacy
LEGACYSTORET_21FLGW	FDEP	Parametric Data	Legacy
LEGACYSTORET_21FLKWAT	FDEP	Parametric Data	Legacy
LEGACYSTORET_21FLMML	Mote Historic Data from Legacy STORET	Parametric Data	Legacy
LEGACYSTORET_21FLSARA	Sarasota Co. Historic Data from Legacy STORET	Parametric Data	Legacy
LEGACYSTORET_21FLSFWM	SFWD	Parametric Data	Legacy
LEGACYSTORET_21FLSWFD	SWFWMD	Parametric Data	Legacy
STORET_21FLBABR	Babcock Ranch	Parametric Data	Legacy
STORET_21FLBRA	Biological Research Associates	Parametric Data	Legacy
STORET_21FLCEN*	FDEP Central Regional Operations Center	Parametric Data	Quarterly
STORET_21FLCHAR*	FDEP Charlotte Harbor Aquatic & Buffer Preserves Sampling Data	Parametric Data	Semi-Annually

Data Source	Data Source Name	Data Type	Update
STORET_21FLDOH*	FL Healthy Beaches Program Data (Bacteria)	Parametric Data	Semi-Annually
STORET_21FLFMRI	IMAP Water Quality Data	Parametric Data	Legacy
STORET_21FLFTM*	FDEP South Regional Operations Center	Parametric Data	Annually
STORET_21FLGFWF	FFWWCC Water Quality Data	Parametric Data	Legacy
STORET_21FLGW*	FDEP Watershed Monitoring Section	Parametric Data	Semi-Annually
STORET_21FLKWAT*	Florida LAKEWATCH	Parametric Data	As Available
STORET_21FLMANA*	Manatee Co. Environmental Management	Parametric Data	Semi-Annually
STORET_21FLPOLK	Polk County Natural Resources Division	Parametric Data	Legacy
STORET_21FLSBL*	City of Sanibel, Natural Resources Department	Parametric Data	Semi-Annually
STORET_21FLSCCF*	Sanibel Captiva Conservation Foundation	Parametric Data	Semi-Annually
STORET_21FLSEAS*	Shellfish Environmental Assessment Section	Parametric Data	Semi-Annually
STORET_21FLSFWM*	South Florida Water Management District	Parametric Data	Semi-Annually
STORET_21FLSWFD*	Southwest Florida Water Management District	Parametric Data	Semi-Annually
STORET_21FLTPA*	FDEP Southwest Regional Operations Center	Parametric Data	Semi-Annually
STORET_21FLWPB*	FDEP Southeast Regional Operations Center	Parametric Data	Annually
STORET_21FLWQA*	FDEP Watershed Assessment Section	Parametric Data	Annually
STORET_21FLWQSP*	FDEP Water Quality Standards & Special Projects	Parametric Data	Annually
STORET_CAPECRD*	City of Cape Coral	Parametric Data	Semi-Annually
STORET_CHNEPCHB	Bokeelia - CHNEP	Parametric Data	Legacy
STORET_CHNEPCHE	Charlotte Harbor East - CHNEP	Parametric Data	Legacy
STORET_CHNEPCHP	Charlotte Harbor Preserve (Cape Haze) - CHNEP	Parametric Data	Legacy
STORET_CHNEPCHW	Charlotte Harbor West - CHNEP	Parametric Data	Legacy
STORET_CHNEPEB	Estero Bay - CHNEP	Parametric Data	Legacy
STORET_CHNEPLLB	Lower Lemon Bay - CHNEP	Parametric Data	Legacy
STORET_CHNEPMP*	Matlacha Pass - CHNEP	Parametric Data	Semi-Annually
STORET_CHNEPPIS	Pine Island Sound - CHNEP	Parametric Data	Legacy
STORET_CHNEPSCB	San Carlos Bay - CHNEP	Parametric Data	Legacy
STORET_CHNEPTCR	Tidal Caloosahatchee River - CHNEP	Parametric Data	Legacy
STORET_CHNEPTMR	Tidal Manatee River - CHNEP	Parametric Data	Legacy
STORET_CHNEPTPR	Tidal Peace River - CHNEP	Parametric Data	Legacy
STORET_CHNEPULB	Upper Lemon Bay - CHNEP	Parametric Data	Legacy
STORET_CITYOFPG*	City of Punta Gorda	Parametric Data	Semi-Annually
STORET_FLPRMRWS*	Peace River Manasota Regional Water Supply	Parametric Data	Semi-Annually
STORET_SWFMDDEP*	SWFWMD	Parametric Data	Annually
SWFWMD_HYDRO	SWFWMD Hydrologic Data Section Data	Parametric Data	Daily
SWFWMD_HYDRO_LEGACY	SWFWMD Hydrologic Data Section Data	Parametric Data	Legacy
SWFWMD_LAKES_WQ	SWFWMD Water Quality Monitoring	Parametric Data	Legacy
USGS_NWIS	USGS National Water Information System	Parametric Data	Near real-time

* These STORET data sources will be replaced by their WIN equivalents as data become available.

TASK 2: Standard Level of Services

Unique Data Updates and Content Management: CHNEP has unique water quality data that will be managed under this task. These data cannot be automatically added, as is the case for STORET, WIN or USGIS. The datasets are also updated more frequently and normally require individual actions by senior staff and faculty. This task includes both GIS and Data Team and Faculty costs.

Product Improvement and Upgrades: This task includes improvement and enhancement to the One Atlas Framework as stated here.

- Improvements and Web/GIS services: This includes all Web/GIS enhancements and improvements for the One Atlas product that are paid for by the partners. It primarily entails improvements to performance and appearance of the product.
- One Atlas Upgrade: Included in this is a functionality upgrade that would not require changes to the One Atlas structure or that would not require significant development efforts.
- Responsible Design Improvements: Efforts will be made to improve the responsive design of pages on the Atlas, and therefore make the website more mobile-friendly.

In the unlikely event that the implementation of new functionality is cost-prohibitive under the terms of the current contract, USF will provide the sponsor with a separate estimate of the cost to make these changes.

Project Management and Travel: A faculty member (Shawn Landry) is assigned as Principal Investigator (PI) to all Standard Level Water Atlas Projects and a staff member (Jan Allyn) is assigned as Co-Principal Investigator. Three quarterly reports, meetings as necessary and full availability of the PI are provided to ensure that the CHNEP Water Atlas fully meets the needs of CHNEP staff and citizens. This component task includes quarterly reports and invoices, travel when necessary and an undetermined number of called meetings for specific aspects of the Water Atlas. The faculty member interfaces with University staff to ensure that CHNEP requirements are properly met.

Task 2 Cost: $26,000

Task 2 Deliverables:

- Data and Site Management – Maintenance of all data sources listed in Table 2 for 12 months. Monthly site revisions to remove, revise, update or add content as directed by CHNEP staff, as well maintenance and web hosting and component upgrades a necessary for 12 months. Additionally, monthly teleconferences between CHNEP staff and Water Atlas staff will be held to communicate about the requested changes to CHNEP Water Atlas Site.
- Project Management and Travel – Project Management, management meetings, answering citizens' inquires and assistance required by CHNEP staff.
- Quarterly Reports – The 3 quarterly reports will summarize work effort, data uploads, site usage and upgrades and travel conducted.

Table 2. Standard (Unique to CHNEP) Spatial and Non-Spatial Data Sets

Data Source	Data Source Name	Data Type	Update
Aerial Imagery		GIS/DB	As Available
Artificial Reefs		GIS/DB	Annually
Bathymetry		GIS/DB	Annually
Drainage Sub-Basins		GIS/DB	Annually
Parks, Boat Ramps and Marinas		GIS/DB	Annually
Roads, Municipalities & other ancillary mapping application datasets.*		GIS/DB	Annually
Seagrass (SWFWMD and SFWMD)		GIS/DB	Annually
CANALWATCH_WQ	Cape Coral Canal Watch	Parametric Data	Semi-annually
CHEVWQMN_WQ	Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network	Parametric Data	Bimonthly
FWC_BABCOCKWEBB_HYDRO	Florida Fish and Wildlife Conservation Commission Hydrology Data at Babcock-Webb WMA	Parametric Data	Annually
LAKELAND_WQ	City of Lakeland Water quality data	Parametric Data	Quarterly
LAKEWATCH_V	Florida LAKEWATCH Volunteer Data	Parametric Data	Bimonthly
LEE_HYACINTH_WQ	Lee County PondWatch	Parametric Data	Quarterly

Data Source	Data Source Name	Data Type	Update
LEE_PONDWATCH_WQ	Lee County PondWatch Data	Parametric Data	Quarterly
LEE_RAINFALL	Lee County Meteorological Data	Parametric Data	Near real-time
LEE_WQ	Lee County Environmental Laboratory	Parametric Data	Biweekly
POLKCO_NRD_WQ	Polk Co. Parks & Natural Resources Division	Parametric Data	Monthly
POLKCO_RAINFALL	Polk Co. Volunteer Rainfall Data	Parametric Data	Legacy
SARASOTA_ARMS	Sarasota Co. Automated Rainfall Management System	Parametric Data	Near real-time
SARASOTA_SONDE_WQ	Sarasota Co. Environmental Services Department	Parametric Data	One-Time
SARASOTAES_WQ	Sarasota Co. Environmental Services Department	Parametric Data	Monthly
* Includes provision for the addition of new datasets to be added to Advanced Mapping Application			

TASK 3: New Water Atlas Features/Enhancements

a. CHNEP maintains the CHNEP Water Atlas to ensure continuing access to water quality data and other technical information to area scientists, resource managers and users, elected officials, and the public. The Atlas displays water quality and hydrology data using maps and charts, making data easier to visualize and understand. Water Atlas users can access pages for individual waterbodies — including lakes, ponds, bays, rivers, and streams — to view associated water quality data. This project will be to expand these services to include a regions in the CHNEP program area- the freshwater Caloosahatchee River.

b. Habitat Restoration Needs (HRN)/Habitat Resiliency to Climate Change (HRCC) Interactive mapping tool: Data from this HRN project will be made readily available to the public and any interested stakeholders though the CHNEP Water Atlas. It is anticipated that the HRN data will be integrated into the CHNEP Water Atlas Advanced Mapping Application in the form of an ArcGIS storymap. This web-based application is capable of presenting habitat and other data in a GIS based platform for easy viewing. Users will be able to access the full set of spatial data by simply clicking on the list of layers on the mapping application and will be able to interactively view the results of the HRN project.

c. Water Quality Dashboard: A map-based water quality dashboard will present recent water quality sampling data for waterbodies within the CHNEP. The application will utilize the same framework used for the Orange County Water Atlas (see the dashboard at: http://www.orange.wateratlas.usf.edu/water-quality-dashboard/). Waterbodies can include bay segments, river segments and lakes. Easy-access filters can be designed to show waterbodies with a WQ value exceeding a threshold; waterbodies within specific basins; waterbody type, or others.

d. Numeric Nutrient Criteria Calculator: The FDEP Numeric Nutrient Standards specify region specific and sometimes site specific criteria (NNC) to determine if a bay, lake/pond or stream (WBID) passes the standard. The NNC calculation for water quality is a multi-step process that evaluates annual geometric mean chlorophyll a, phosphorus and nitrogen based on thresholds that depend on the long-term color and alkalinity of a lake, or the location in a specific watershed region for a stream. The NNC can be thought of as a series of if-then evaluations to determine whether a WBID will pass or fail the standard. Using the data already available in the Water Atlas, USF can implement a NNC Calculator tool on the Water Atlas for CHNEP staff (or others) to evaluate the status of waterbodies and WBIDs on a regular basis. The Calculator will be designed as a password-protected series of webpages so that local water management staff (CHNEP partners) will be able to see the current status of impairments within the region. The tool will serve as a pro-active alert system.

e. Lake Okeechobee Conditions: Lake Okeechobee has had and will continue to have serious implications for CHNEP waterbodies, but the expanded region does not actually include the lake. Thus, the lake will not be on the Water Atlas. To remedy this problem, a set of pages will be created on the CHNEP Water

Atlas to include a focus on current conditions and trends in the lake. Monitoring data from FDEP, SFWMD and USGS will be incorporated into the Atlas database (including near-realtime water levels data) and presented on these dedicated pages. Additional content such as management reports, plans, and spatial datasets can also be included. This new section will allow residents and water managers to easily access the status and conditions in the lake.

f. Improved data graphs and new parameters: The current bay/estuary pages on the CHNEP Atlas display only a limited number of water quality parameters and the graphing technology is old. Newer technology and additional water quality parameters have been integrated into the Sarasota Water Atlas Bay Conditions pages (http://www.sarasota.wateratlas.usf.edu/bay-conditions/report/99/lower-lemon-bay/2018/). Although rated "conditions" are not needed, the additional water quality parameters and the better graphing technology will be implemented on the CHNEP Water Atlas bay pages. For example, new parameters can include: color, DO saturation, TKN and other nitrogen species, pH, specific conductance, temperature, or others. The new graphing will display statistics and basic trendlines.

Task 3 Cost:

a. Program Area Expansion on Water Atlas: $8,000
b. HRN/HRCC Interactive Storymap or Interactive Mapper: $4,000
c. Water Quality Dashboard: $2,000
d. Numeric Nutrient Criteria Calculator: $4,000
e. Lake Okeechobee Conditions: $4,500
f. Improved data graphs and new parameters: $2,500

Task 3 Deliverables:

a. Publicly accessible comprehensive database of water quality in waterbodies throughout the CHNEP program area *including CHNEP expansion area in Freshwater Caloosahatchee River*
b. HRN and HRCC Interactive mapping tool (Storymap) on the CHNEP water atlas
c. Water Quality Dashboard
d. Numeric Nutrient Criteria Calculator
e. Lake Okeechobee Conditions: Improved data graphs and new parameters
f. Improved data graphs and new parameters: $2,500

PROJECT SCHEDULE AND BUDGET

Task	Deliverables	Schedule	Cost
Task 1 Basic	Data Management, Site Maintenance & Annual Report	10/1/2019 - 9/30/2020	$26,000
Task 2 Standard	Data Management, Project Management & Quarterly Reports	10/1/2019 - 9/30/2020	$26,000
Task 3 Enhancements	Features/Enhancements	10/1/2019 - 9/30/2020	$25,000
	Total Cost (includes mandated 25% USF Indirect Cost)		**$52,000**

The key faculty and staff members from USF that will be involved in this project include: Shawn Landry (PI), Jan Allyn (Co-PI), Keith Bornhorst, Jason Scolaro, David Eilers and Rich Hammond. The key staff from the Coastal & Heartland National Estuary Partnership (CHNEP) for this project include: Jennifer Hecker (project lead) and Nicole Iadevaia (project support and technical lead).