



2011 Annual Quality Assurance Report Watershed Data Services Section STORET Subsection

January 2012

Abstract

The DEP Watershed Data Services (WDS) STORET Subsection implements Florida statutory requirements, FDEP rule requirements and U.S. EPA requirements for management of environmental (non-regulatory databases) data for the state through Florida STORET. WDS STORET manages data from both internal (e.g., FDEP District Offices through FDEP STORET) and external (e.g., Water Management Districts (WMDs), Counties, local governments through FLASTORET) data providers, and provides these data to internal and external users of the data through the Florida STORET data warehouse and the publicly available STORET Public Access (SPA) Website. Management of the data in Florida STORET includes working with data providers to assist them with loading data to STORET by developing and maintaining databases and other software applications, and training data providers (e.g., on data maintenance, quality assurance and migration). WDS STORET also uploads the data to the U.S. EPA Water Quality Exchange (WQX) per federal requirements.

Much of work conducted by WDS STORET staff is for the purpose of ensuring the scientific and legal defensibility of the environmental data we manage. This annual Quality Assurance Report describes the training, assessment/auditing and corrective actions undertaken by WDS STORET in 2011 to ensure that environmental data met our established quality criteria.

During 2011, one new STORET staff member was trained, five new data providers, new staff for four established data providers, and conducted continuing training for existing STORET staff. Also during 2011, we developed and implemented new data checking tools and routines for use by STORET staff and by data providers, and continued with the implementation of existing data checking tools, including improvements to those tools. As a result of the application of these tools and data checking processes, and working in conjunction with data providers, STORET staff updated and verified approximately 950,000 records that were identified with issues or errors.

In 2012, WDS STORET staff will continue to conduct training, data auditing and corrective actions according to our Quality Plan, including planning for improvements to those processes, as appropriate and possible.

Report of Quality Assurance Activities and Issues

1. Quality Assurance Training Activities

The STORET subsection conducted or participated in a range of QA training activities in 2011. These activities can be divided into two categories; internal training of FDEP STORET staff and external quality assurance training for Florida STORET data providers.

Internal Training

In 2011, the STORET subsection hired one new staff member. Training of the new staff member, as well as refresher training for existing STORET staff, was conducted in accordance with Section 5 of the WDS STORET Subsection Quality Plan, and included the following:

- Training to install STORET software and to troubleshoot errors;
- Training staff on the STORET database structure, schemas and tables;
- Training staff on the difference between U.S. EPA STORET, FLASTORET, FDEP STORET, Legacy STORET, U.S. EPA WQX, Doppler SBIO (FDEP Statewide Biological Database), and backdoor databases;
- Training staff about the FDEP Bureau of Laboratory LIMS (Laboratory Information Management System) and the Data Merge Tool (DMT) relative to STORET;
- Training staff on creating and formatting text files, importing into SIM, creating .dmp files, exporting .dmp files;
- Training staff to develop software applications for data provider use with STORET;
- Training staff on conducting data QA activities, including data import and migration processes;
- Training staff on use of and recommended corrective actions relative to the STORET Data Checker;
- Training staff on use and recommended corrective actions relative to the SIM (STORET Import Module) Checker;
- Training staff how to document QA activities;
- Training staff on SQL for Oracle and Access;
- Training staff about applicable FDEP Rules, program area data requirements and federal reporting data requirements;
- Training staff how to use the STORET Public Access (SPA) website and QA updates and/or changes made to SPA;
- Review of ethics policy; and
- Periodic refresher trainings or delivery of updated information, when needed.

Several examples of areas of training conducted this year are described below.

Conducting and documenting data QA activities

WDS STORET uses quality assurance tools to provide accurate and thorough data quality checks. These tools are utilized independent of the STORET loading process and are updated frequently to support new and existing state and federal data quality guidelines. STORET personnel received training on the functionality and application of these tools.

The STORET Data Checker is a tool that queries data within the STORET database for data errors and QA violations. The SIM Checker is a tool that queries data within the SIM application (STORET Import Module) before data are migrated to the STORET database. Staff is trained on the use of these data checker tools.

SQL for Oracle

SQL (Structured Query Language) is a computer language used to query and manipulate data within the STORET Oracle database. STORET personnel received training and continually improve their expertise in the use of SQL.

STORET applicable FDEP Rules, program area data requirements and federal reporting data requirements

STORET staff must know and understand the QA rules that relate to all data being migrated through the STORET system. The STORET Coordinator is the filter by which QA rule violations are identified and corrected. To this end, STORET personnel attended appropriate Department and Division-wide meetings, and participated in subsection staff meetings to refresh their understanding of existing data QA requirements as well as to learn about modifications to those requirements. These meetings and training emphasized quality assurance measures in accordance with Chapter 62-160, Florida Administrative Code (the Department's Quality Assurance Rule for Water, Waste and Resource Management), Chapter 62-303, Florida Administrative Code (the Department's rule for Identification of Impaired Surface Waters), EAS 01-01 (Data Quality Assessment Elements for Identification of Impaired Surface Waters), and DEP-QA-002/02 (Requirements for Field and Analytical Work Performed for The Department of Environmental Protection under contract).

Training SOPs

WDS STORET staff has developed and maintains a library of training SOPs for use by subsection staff, a list of which is provided in Section 11 of the WDS STORET Subsection Quality Plan.

External Training

In 2011, we acquired five new data providers to Florida STORET. In addition, FDEP STORET staff provided training and assistance to four existing data providers that had new STORET contact personnel.

New Data Provider Training

When a new agency intends to begin loading data to Florida STORET, we provide the agency with an installation of the software required for data uploads. As part of the software installation, we train the new data providers on the functionality of the software as well as on the required data quality assurance necessary for them to provide their data in accordance with state and federal guidelines.

Software orientation takes one day, and training on data quality assurance requirements takes one day. In 2011, five new agencies began loading data to Florida STORET. The training process for those agencies included software installation, software orientation, and data quality assurance training. The agencies were Collier County Coastal Zone Management Department, City of Jacksonville Beach, Jacksonville Electric, the City of Atlantic Beach, and the City of Neptune Beach.

New STORET Contact Personnel training

An existing data provider may have personnel changes. In this case, the new STORET contact for that agency must receive training similar to that of a new data provider. In 2011, STORET staff provided training and assistance to four agencies for their new STORET contact personnel: Florida Fish and Wildlife Conservation Commission (FWC), FDEP Southwest District, Avon Park, and Suwannee Water Management District.

Training Documents

We maintain a library of training documents accessible to data providers through the STORET ftp site, on the FDEP STORET webpage, and made available upon request. A list of those documents is provided in Section 11 of the WDS STORET Subsection Quality Plan.

Quarterly STORET Newsletter

The STORET newsletter, *The H2O Drop*, is a document that focuses on data quality rules and technical data loading tips for Florida's STORET data providers. All agencies that load data to Florida STORET (FLASTORET and FDEP STORET) receive email notification once a quarter that a new issue is available, along with the link to that new issue. Among other information, the Quarterly newsletter provides the latest information to data providers regarding QA-related activities relevant to uploading data to Florida STORET. Click [here](#) to view previous issues of *The H2O Drop*.

2. Audit Activities

The WDS STORET Subsection conducts data assessments serving the purpose of audits throughout our data management process, resulting in data verification and/or data corrections, and documentation. Data assessments are an integral part of the WDS STORET Subsection data management process for Florida STORET. The results of this integral data assessment are captured in weekly, monthly and annual data quality reporting.

The STORET subsection staff conducted assessment activities throughout 2011 to evaluate and document the quality of data in Florida STORET (both FLASTORET and FDEP STORET) in accordance with Sections 6 and 7 of the WDS STORET Subsection Quality Plan. In support of this process of assessment, new data checker tools were developed and implemented, and existing data checker tools were refined. Table 1 in the WDS Quality Plan provides a full list of the data quality checks conducted using these tools. Each data checker produces a data quality report specific to a particular agency loading data to Florida STORET. A report highlights data errors and QA violations. STORET staff evaluates each report and provides assistance to the agency and corrective actions to the data in accordance with Section 6 of the WDS STORET Subsection Quality Plan.

STORET Process Improvement

STORET personnel meet weekly to discuss, design, and implement ways in which the STORET process can be improved upon for both the STORET staff and for agencies that use the STORET system to provide data to the state for assessments and other purposes. Within these meetings, many of the QA tools used by the subsection or by data providers are birthed or improved upon. For example, as a result of these meetings in 2011, STORET staff improved upon the STORET Data Checker, and developed newly the SIM Checker, a FDEP STORET Audit Table, and a solution to the structural differences between U.S. EPA WQX and Florida STORET.

STORET Data Checker improvements and implementation

The STORET Data Checker is an existing tool (previously developed) used to query data within the STORET database for data errors and QA rule violations. Reports produced from the STORET Data Checker are archived and used for future reference. STORET staff is continually updating and improving upon the STORET Data Checker, and improvements to this tool were made in 2011.

SIM Checker development and implementation

In 2011, STORET staff developed and implemented a second data checker tool called the SIM (STORET Import Module) Checker. The SIM Checker queries data for errors and QA violations in the SIM application BEFORE the data are migrated to the STORET database. This new data checker tool was provided to our external data providers who use it as part of the STORET data loading procedure. Reports from this tool are archived by the data provider and accessed as reference during data quality correction. This tool saves both the data provider and the STORET staff much time and expense by catching data errors and QA violations early in the STORET loading process.

FDEP STORET Audit Table Development

As a result of the STORET Process Improvement meetings, in 2011 STORET staff developed and implemented a FDEP STORET Audit Table for the purpose of tracking changes made within the FDEP STORET database. This new audit table is providing important information to STORET staff concerning the activities within FDEP STORET. STORET staff anticipates furthering its development and functionality.

Florida STORET and WQX

WDS STORET staff uploads data from Florida STORET to the U. S. EPA Water Quality Exchange (WQX). The differences between requirements of WQX relative to Florida STORET (the latter is based on the former EPA STORET) have necessitated WDS STORET to implement new requirements within the STORET system, and with data providers, so that the data can be loaded to WQX without incident. STORET staff developed a crosswalk from Florida STORET to WQX, and designed a method of export from Florida STORET to meet the requirements of WQX. In doing so, STORET staff developed a system of “WQX” data checks. Within this system of checks are two tools. WQX-specific checks have been added to the currently used STORET Checker to identify data that violate the WQX business process and quality assurance rules. These violations are identified on the data provider end and can be corrected before submission to Florida STORET. A second tool, the Node Checker, is a set of the same WQX-specific checks and is run against data that have been loaded into the Node

Staging Tables awaiting upload to EPA WQX. In 2011, these tools have been significantly improved upon.

Agency Activity Tracking Database

STORET staff is in constant communication with data providers. Such communication is important to understanding the needs and data issues of each data-loading agency. WDS STORET keeps a record of such communications in an agency tracking database, STORET_AtlasZ.mdb. Once a week, STORET staff updates this database with data provider activities, comments, communications, data updates and loading events. From this database, a report is created and sent to various management personnel throughout FDEP to enhance communication between cooperating sections within the Department.

3. Quality Assurance Issues and Corrective Actions

The process of data entry, upload and management, as well as the range, complexity and volume of the environmental data being provided to Florida STORET necessarily mean that data cannot be provided error free. In addition, any time there is manual data entry, or human interaction with a system as complex as STORET, errors or questions may and do occur. As described in this report and in our Quality Plan, WDS STORET employs a range of QA tools and checks to identify issues and errors so that data corrections can be made, and has processes in place to document those activities. Through our QA checks (e.g., STORET Data Checker, SIM Checker), and working with data providers, in 2011, STORET staff identified data issues which led to updates and verification of approximately 950,000 records.

4. References

- Quality Plan for the Watershed Data Services Section STORET Subsection. Florida Department of Environmental Protection. June 30, 2011.
- Chapter 62-160, Florida Administrative Code. Florida Department of Environmental Protection Quality Assurance Rule for Water, Waste and Resource Management. December 3, 2008.
- Chapter 62-303, Florida Administrative Code. Identification of Impaired Surface Waters. Florida Department of Environmental Protection. September 4, 2007.
- EAS 01-01. Data Quality Assessment Elements for Identification of Impaired Surface Waters. Florida Department of Environmental Protection, Environmental Assessment Section (EAS). April 3, 2001.
- DEP-QA-002/02. Requirements for Field and Analytical Work Performed for The Department of Environmental Protection under contract. Florida Department of Environmental Protection. April 15, 2002.