Data Acquisition Standard Operating Procedures

St. Johns River Water Management District Continuous Water Quality Programs (ID# 5061)

Last Updated: 2/17/2024

Program Summary

The water quality monitoring network at the district was initially designed and implemented in the early 1980s and has since been improved and expanded. The current network is comprised of more than 400 surface water sampling stations, more than 450 groundwater stations throughout the district's 18-county service area and more than 20 continuous water quality stations in freshwater, springs and estuaries, collecting real-time water quality data to support district projects.

URLs

- Program - https://www.sjrwmd.com/data/water-quality/
- DDI - https://data.florida-seacar.org/programs/details/5061

Contacts

Contact Name	Organization	Email	Phone
Tim Miller	Technical Program Manager	TMiller@sjrwmd.com	

Data Tables

- Data_5061A_Final
- Data_5061A_Final_depths
- Data_5061A_Final_QACodes
- Data_5061A_Final_QACodes_include
- Data_5061A_Load
- Data_5061B_Final
- Data_5061B_Final_depths
- Data_5061B_Final_QACodes
- Data_5061B_first_Load
- Data_5061B_Load

Data Stored Procedures

- usp_Data_5061A_Load_insert
- usp_Data_5061B_Load_insert
- usp_Data_5061B_Load_pivot_insert
- usp_combined_wq_wc_nut_cont_insert_5061A
- usp_combined_wq_wc_nut_cont_insert_5061B

Data Acquisition Standard Operating Procedures: ProgramID *5061*

Date Created: *05/25/2020*

Created By: *Mrudhula Murali*

Date Modified: *09/14/2022*

Modified By: *Jennifer Baker*

Data File Paths:

1. ~~Data: "\\forest.usf.edu\data\PDrive\CAS-WI\Misc Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD\DataToLoad\SJRWMD-Stations.csv"~~
2. ~~Data: "\\forest.usf.edu\data\PDrive\CAS-WI\Misc Projects\SEACAR_FDEP\ Data\ID_5061 SJRWMD\DataToLoad \ IRLB04_Data_1987-2019.csv"~~
3. ~~Data: "\\forest.usf.edu\data\PDrive\CAS-WI\Misc Projects\SEACAR_FDEP\ Data\ID_5061 SJRWMD\DataToLoad \ NCB19020038_Data_2014-2019.csv"~~
4. ~~Data: "\\forest.usf.edu\data\PDrive\CAS-WI\Misc Projects\SEACAR_FDEP\ Data\ID_5061 SJRWMD\DataToLoad \ NCBNRCM_Data_2015-2019.csv"~~
5. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ CM17Street_2014-02-10_2017-03-07.xlsx~~
6. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ CMMerritt_2014-02-25_2017-04-26.xlsx~~
7. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ CMVero_2017-04-25_2020-09-17.xlsx~~
8. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ GIS_5061 WQ Continuous Stations.xlsx~~
9. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ IRLB04_2017-04-25_2020-09-17.xlsx~~
10. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ NCB19020038_2015-03-16_2019-07-11.xlsx~~
11. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ NCBARD16_2015-03-18_2016-01-21.xlsx~~
12. ~~Data: "U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD \DataToLoad\ NCBNRCM_2015-03-17_2019-06-25.xlsx~~
13. ~~Data: " U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD\DataToLoad\ContinuousData_Station_IRLB04"~~
14. ~~Data: " U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD\DataToLoad\ IRLB04_2020-09-01_2021-04-12.xlsx"~~
15. Data: U:\Misc_Projects\SEACAR_FDEP\Data\ID_5061 SJRWMD\DataToLoad\BulkExport*.csv

DDI URL: http://dev.seacar.waterinstitute.usf.edu/datadiscovery/programs/details/5061

Contact Information:

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Contact Organization: St. Johns River Water Management District Continuous Water Quality Programs

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Contact Phone: 386-643-1909

Procedure Overview:

1. Use SQL Server Import Export Wizard to load the file "SJRWMD-Stations.csv "into table **Locations_5061A.**
2. Use SQL Server Import Export Wizard to load the file "GIS_5061 WQ Continuous Stations.xlsx "into table **Locations_5061B.**
3. Use SQL Server Import Export Wizard to load the file "IRLB04_Data_1987-2019.csv, NCB19020038_Data_2014-2019.csv, NCBNRCM_Data_2015-2019.csv "into table **Data_5061A_Load. (Discrete data)**
4. Use SQL Server Import Export Wizard to load the file "CM17Street_2014-02-10_2017-03-07.xlsx, CMMerritt_2014-02-25_2017-04-26.xlsx, CMVero_2017-04-25_2020-09-17.xlsx, IRLB04_2017-04-25_2020-09-17.xlsx, NCB19020038_2015-03-16_2019-07-11.xlsx, NCBARD16_2015-03-18_2016-01-21.xlsx, NCBNRCM_2015-03-17_2019-06-25.xlsx", "IRLB04_2020-09-01_2021-04-12.xlsx" into table **Data_5061B_Load. (Continuous Data)**
    a. **Altering the header of the file to match the heap table for bulk data loads is an effective shortcut to the import process for bulk-export*.csv files**
5. Execute procedures **usp_Data_5061A_Load_insert** to load the data into **Data_5061A_Final** tables.
6. Execute procedures **usp_Data_5061B_Load_insert** to load the data into **Data_5061B_Final** tables.
7. Add new Monitoring Locations from table **Locations_5061*** into the **SampleLocation_Point** table.
8. Add new Monitoring Locations into the **SampleLocation** table. This will generate a LocationID for each Monitoring Location.
9. Update the **SampleLocation_Point** table with the LocationID generated in the **SampleLocation** table. Run procedure usp_SampleLocation_Point_update to do this.
10. Update the LocationID column in table **Data_5061*_Final** with the LocationID in the **SampleLocation** table. Join on the [Station] column in **Data_5061*_Final** and the ProgramLocationID column in **SampleLocation.**

Data Tables

1. Data_5061A_Load
2. Data_5061B_Load
3. Data_5061A_Final
4. Data_5061B_Final

Data Stored Procedures

1. usp_Data_5061*_Load_insert
2. usp_SampleLocation_Point_update
3. usp_combined_wq_wc_nut_cont_insert_5061*

GIS Procedures

1. Complete steps 3 through 7 in the “Procedure Overview” section of this document.
2. The location information is available in **Locations_5061*** tables.

```
SET ANSI_NULLS ON
SET QUOTED_IDENTIFIER ON


CREATE PROC [dbo].[usp_combined_wq_wc_nut_cont_insert_5061A]

AS
BEGIN
SET NOCOUNT ON;
SET XACT_ABORT ON;


-- EXCEPTION: THIS PROC DOES NOT ADD ANY RECORDS WHERE THE VALUEQUALIFER WOULD BE INCLUDE_YN = 0
-- RESULT: ALL VALUEQUALIFIERID VALUES ARE NULL

-- Constants - PLEASE SET NOW!!
DECLARE @dataLoadCode varchar(10) = '5061A';
DECLARE @combinedTable varchar(50) = 'Combined_WQ_WC_NUT_cont';

-- Setup data load
DECLARE @runBy varchar(50) = SYSTEM_USER;
DECLARE @programID int, @dataStreamID int;

SELECT@dataStreamID = DataStreamID,
@programID = ProgramID
FROMDataStreamProcedure
WHEREDataLoadCode = @dataLoadCode;

-- Delete existing data
exec usp_delete_combined  @dataStreamID, 'Combined_WQ_WC_NUT_cont'

-- Insert data
INSERT INTO Combined_WQ_WC_NUT_cont (ProgramID, DataStreamID,  ParameterID, LocationID, ActivityID
ActivityType, SampleDate, ActivityDepth_m, RelativeDepth, TotalDepth_m, ResultValue, MDL, PQL,
DetectionUnit, ValueQualifierID, SampleFraction, ResultComments, DateAdded, SEACAR_EventID)
SELECT   @programID, @dataStreamID, b.TargetParameterID, a.LocationID, NULL, NULL,
CAST(a.Sample_Collection_Date_and_Time as datetime), e.ActivityDepth, NULL, e.TotalDepth,
CAST(a.[Measured_Value] as numeric(25,8)), nullif(MDL,''),NULL, NULL, NULL, NULL, NULL, GETDATE(),
NULL
FROMData_5061A_Final a
INNER JOIN Combined_Conversion_Parameters b on a.Parameter = b.OriginalParameter AND @dataStreamID
b.DatastreamID
INNER JOIN Data_5061A_Final_QACodes_include vq on a.Data_Qualifier_Code = vq.Data_Qualifier_Code A
vq.Include_YN = 1
--LEFT JOIN Data_5061A_Final_QACodes qa on CHARINDEX(qa.Data_Qualifier_Code, a.Data_Qualifier_Code
0) > 0
LEFT JOIN [Data_5061A_Final_depths] e on a.EventID = e.EventID and a.Sample_Type = e.SampleType
WHERE a.LocationID IS NOT NULL
AND a.Parameter NOT IN ('Depth of Collection-m','Depth of Stream-m')
AND isnumeric(try_convert(numeric(25,8),a.measured_value)) = 1
ORDER BY a.Measured_Value

-- Tracking Stats
DELETECombined_Data_Tracking
WHERECombinedTableName = 'Combined_WQ_WC_NUT_cont'
ANDDataStreamID = @dataStreamID

INSERT INTO Combined_Data_Tracking (ProgramID, IndicatorID, DataStreamID, ParameterID,
CombinedTableName, NumRowsFinal, NumRowsCombined, LastUpdateDate, LastUpdateBy)
SELECTa.ProgramID, b.IndicatorID, a.DataStreamID, a.ParameterID, 'Combined_WQ_WC_NUT_cont',
COUNT(a.ResultValue), COUNT(a.ResultValue), GETDATE(), @runBy
FROMCombined_WQ_WC_NUT_conta
INNER JOINCombined_Parameters b on a.ParameterID = b.ParameterID
WHEREa.DataStreamID = @dataStreamID
GROUP BY a.ProgramID, b.IndicatorID, a.DataStreamID, a.ParameterID
```

```
/*
SELECT *
FROM combined_wq_wc_nut_cont

SELECT Distinct Parameter, units
FROM data_5061A_load
order by Parameter

SELECT *
FROM data_5061A_final

SELECT *
FROM DataStreamProcedure
where ProgramID = 5061

SELECT *
FROM combined_conversion_parameters
where datastreamID = 1393
ÿ
*/

END



GO
```

```
SET ANSI_NULLS ON
SET QUOTED_IDENTIFIER ON

CREATE  PROC [dbo].[usp_combined_wq_wc_nut_cont_insert_5061B]

AS
BEGIN
SET NOCOUNT ON;
SET XACT_ABORT ON;

-- Constants - PLEASE SET NOW!!
DECLARE @dataLoadCode varchar(10) = '5061B';
DECLARE @combinedTable varchar(50) = 'Combined_WQ_WC_NUT_cont';

-- Setup data load
DECLARE @runBy varchar(50) = SYSTEM_USER;
DECLARE @programID int, @dataStreamID int;

SELECT@dataStreamID = DataStreamID,
@programID = ProgramID
FROMDataStreamProcedure
WHEREDataLoadCode = @dataLoadCode;

-- Delete existing data
exec usp_delete_combined  @dataStreamID, 'Combined_WQ_WC_NUT_cont'

-- Insert data
INSERT INTO Combined_WQ_WC_NUT_cont (ProgramID, DataStreamID,  ParameterID, LocationID, ActivityID
ActivityType, SampleDate, ActivityDepth_m, RelativeDepth, TotalDepth_m, ResultValue, MDL, PQL,
DetectionUnit, ValueQualifierID, SampleFraction, ResultComments, DateAdded, SEACAR_EventID)
SELECT   @programID, @dataStreamID, b.TargetParameterID, a.LocationID, NULL, NULL,
CAST(a.[Timestamp] as datetime), e.Depth, NULL, NULL, CAST(a.[Value] as numeric(25,8)), NULL, NULL
NULL, NULL, NULL, NULL, GETDATE(), NULL
FROMData_5061B_Final a
INNER JOIN Combined_Conversion_Parameters b on a.Parameter = b.OriginalParameter AND @dataStreamID
b.DatastreamID
--LEFT JOIN data_5061B_final_qacodes qa on qa.data_qualifier_code = a.Qualifiers
LEFT JOIN [Data_5061B_Final_depths] e on a.EventID = e.EventID
WHERE a.LocationID IS NOT NULL
AND a.Parameter NOT IN ('Depth of Collection')
AND a.Qualifiers IS NULL --we only want to load data that does NOT have a value qualifier




/*
SELECT *
FROM combined_wq_wc_nut_cont

SELECT Distinct Parameter, units
FROM data_5061B_load
order by Parameter

SELECT *
FROM data_5061B_final

SELECT *
FROM DataStreamProcedure
where ProgramID = 5061

SELECT *
FROM combined_conversion_parameters
where datastreamID = 1393
ÿ
*/
```

```
END


GO
```

```
SET ANSI_NULLS ON
SET QUOTED_IDENTIFIER ON
CREATE PROC [dbo].[usp_Data_5061A_Load_insert]
AS
BEGIN
SET NOCOUNT ON
SET XACT_ABORT ON

--TRUNCATE TABLE Data_5061A_Final

INSERT INTO [dbo].[Data_5061A_Final]

([Station],[Point_Location_Description],[Parameter],[Unit_of_Measure],[STORET_Number],[Sample_Col
n_Date_and_Time],[Measured_Value]

,[Data_Qualifier_Code],[Sample_Type],[MDL],[PQL],[Method_Description],[Matrix],[Major_Class_Descri
],[Minor_Class_Description]
           ,[Sample_Collection_Organization],[Vendor_name],[Sample_Comments],[Analyte_Comments])
        SELECT
replace([Station],'"',''),replace([Point_Location_Description],'"',''),replace([Parameter],'"',''
ace([Unit_of_Measure],'"',''),replace([STORET_Number],'"',''),[Sample_Collection_Date_and_Time]

,replace([Measured_Value],'"',''),replace([Data_Qualifier_Code],'"',''),[Sample_Type],[MDL],[PQL],
ce([Method_Description],'"',''),[Matrix],[Major_Class_Description]

,[Minor_Class_Description],[Sample_Collection_Organization],replace([Vendor_name],'"',''),replace(
le_Comments],'"',''),replace([Analyte_Comments],'""','')
      FROM [seacar].[dbo].[Data_5061A_Load] l
WHERE not exists (
SELECT *
FROM [dbo].[Data_5061A_Final] f
WHERE  replace(l.[Station],'"','') = f.station
andreplace(l.[Parameter],'"','') = f.Parameter
andl.[Sample_Collection_Date_and_Time] = f.[Sample_Collection_Date_and_Time])


-- SET EventID on [Data_5061A_Final]
SELECT[Station], [Sample_Collection_Date_and_Time], Sample_Type
INTO#activities
FROMData_5061A_Final
GROUP BY[Station], [Sample_Collection_Date_and_Time], Sample_Type

ALTER TABLE #activities ADD EventID uniqueidentifier

UPDATE #activities SET EventID = NEWID()

UPDATEcd
SETcd.EventID = a.EventID
FROMData_5061A_Finalcd
INNER JOIN#activitiesa ON cd.[Station] = a.[Station]
AND cd.[Sample_Collection_Date_and_Time] = a.[Sample_Collection_Date_and_Time]
AND cd.Sample_Type = a.Sample_Type

-- INSERT into [Data_5061A_Final_depths]
TRUNCATE TABLE [Data_5061A_Final_depths]

-- This is ONLY Activity Depth
INSERT INTO [Data_5061A_Final_depths](EventID,ActivityDepth,TotalDepth,SampleType)
SELECT a.EventID, MAX(CASE WHEN a.Parameter = 'Depth of Collection-m' THEN a.Measured_Value END),
MAX(CASE WHEN a.Parameter = 'Depth of Stream-m' THEN a.Measured_Value END), a.Sample_Type
FROM Data_5061A_Final a
WHERE a.Parameter IN ('Depth of Collection-m','Depth of Stream-m')
GROUP BY a.EventID, a.Sample_Type

-- INSERT INTO Data_5061A_Final_QACodes_include
```

```
TRUNCATE TABLE Data_5061A_Final_QACodes_include

INSERT INTO Data_5061A_Final_QACodes_include(Data_Qualifier_Code)
SELECT DISTINCT a.Data_Qualifier_Code
FROM Data_5061A_Final a

-- UPDATE Data_5061A_Final_QACodes_include [Include_YN] column
;with cte as
(
SELECT a.Data_Qualifier_Code, dbo.GROUP_CONCAT(vq.Include_YN) as Inc,
dbo.GROUP_CONCAT(vq.ValueQualifierID) as VqID
FROM Data_5061A_Final_QACodes_include a
LEFT JOIN Data_5061A_Final_QACodes qa on CHARINDEX(qa.Data_Qualifier_Code, a.Data_Qualifier_Code,
> 0
LEFT JOIN Combined_ValueQualifier vq on qa.ValueQualifierID = vq.ValueQualifierID
GROUP BY a.Data_Qualifier_Code
)
UPDATE a
SET a.Include_YN = CASE WHEN b.Inc LIKE '%0%' THEN 0 ELSE 1 END
FROM Data_5061A_Final_QACodes_include a
INNER JOIN cte b on a.Data_Qualifier_Code = b.Data_Qualifier_Code



UPDATE a
SET a.LocationID = b.LocationID
FROM Data_5061A_Final a
INNER JOIN samplelocation b on a.Station = b.ProgramLocationID
WHERE b.ProgramID = 5061 and a.LocationID is null
/*
select distinct parameter
from Data_5061A_Final
order by 1
*/
END







GO
```

```
SET ANSI_NULLS ON
SET QUOTED_IDENTIFIER ON
CREATE PROC [dbo].[usp_Data_5061B_Load_insert]
AS
BEGIN
SET NOCOUNT ON
SET XACT_ABORT ON


-- Make the units consistent
UPDATE Data_5061B_Load
SET Units = 'SU'
WHERE Units = 's.u.'
AND parameter = 'pH'
ÿ
UPDATE Data_5061B_Load
SET Units = 'uS/cm'
WHERE Units = 'µS/cm'
AND parameter = 'Sp Cond'
ÿ
UPDATE Data_5061B_Load
SET Units = 'FNU'
WHERE Units = '_FNU'
AND parameter = 'Turbidity Form Neph'
ÿ
UPDATE Data_5061B_Load
SET Units = 'deg C'
WHERE Units = '°C'
AND parameter = 'Water Temp'
ÿ
UPDATE Data_5061B_Load
SET Units = 'deg C'
WHERE Units = 'degC'
AND parameter = 'Water Temp'



INSERT INTO Data_5061B_Final([StationName], [Parameter], [Timestamp], [Value], [Units], [Qualifier
[Grade], [Approval], [DataQualityDescription])
SELECT [StationName], [Parameter], [Timestamp], [Value], [Units], [Qualifiers], [Grade], [Approval
[DataQualityDescription]
FROM Data_5061B_Load a
where not exists (SELECT *
  FROM Data_5061B_Final b
  WHERE CAST(b.[Timestamp] as datetime) = CAST(a.[Timestamp] as datetime)
  AND b.StationName = a.StationName
  AND b.Parameter = a.Parameter
  --and CAST(a.Timestamp as datetime) > '8/11/2021 12:00'
  )
and CAST(a.Timestamp as datetime) > '8/11/2021 12:00'
and a.Value <> 'NaN'
AND a.Value IS NOT NULL
AND a.Value <> ''



-- SET EventID on [Data_5061B_Final]
SELECT[StationName], [Timestamp]
INTO#activities
FROMData_5061B_Final
GROUP BY[StationName], [Timestamp]

ALTER TABLE #activities ADD EventID uniqueidentifier

UPDATE #activities SET EventID = NEWID()
```

```
UPDATEcd
SETcd.EventID = a.EventID
FROMData_5061B_Finalcd
INNER JOIN#activitiesa ON cd.[StationName] = a.[StationName]
AND cd.[Timestamp] = a.[Timestamp]


-- INSERT into [Data_5061B_Final_depths]
TRUNCATE TABLE [Data_5061B_Final_depths]

-- This is ONLY Activity Depth
INSERT INTO [Data_5061B_Final_depths](EventID,Depth)
SELECT DISTINCT a.EventID, a.[Value]
FROM Data_5061B_Final a
WHERE a.Parameter = 'Depth of Collection'

UPDATE a
SET a.locationid = b.locationid
FROM  Data_5061B_Final a
left JOIN SampleLocation_Point b on a.StationName = b.ProgramLocationID
WHERE b.ProgramID = 5061
AND a.locationid is null
/*
drop table #activities
ÿ
TRUNCATE TABLE [Data_5061B_Final_depths]
ÿ
UPDATE  Data_5061B_Final
SET EventID = NULL
WHERE EventID IS NOT NULL
*/

END




GO
```

```
SET ANSI_NULLS ON
SET QUOTED_IDENTIFIER ON
CREATE PROC [dbo].[usp_Data_5061B_Load_pivot_insert]
AS
BEGIN
SET NOCOUNT ON
SET XACT_ABORT ON


--Truncate Table  Data_5061B_Load -- only for POR if needed
;with cte as(
Select 'IRLB04' as StationName, Parameter, sampledate as [Timestamp], [Value]--, Units, Qualifiers
Grade, Approval, DataQualityDescription
FROM
(
SELECTsampledate, [Water Temp], [Turbidity Form Neph], Salinity, [Relative Chlorophyll] , pH,
[Dissolved Oxygen], [DO Saturation], [Depth of Collection], fDOM, [Sp Cond]
FROM[dbo].[Data_5061B_first_Load]
) a
UNPIVOT
(
[Value] FOR [Parameter] IN ([Water Temp] , [Turbidity Form Neph] , Salinity,  [Relative
Chlorophyll], pH ,[Dissolved Oxygen], [DO Saturation], [Sp Cond],[Depth of Collection],fDOM)
) as b
), cte2 as (
ÿ
SELECT cte.*, ccp.OriginalUnits as Units
FROM cte
left join Combined_Conversion_Parameters ccp on cte.Parameter = ccp.OriginalParameter and
ccp.DatastreamID = 1393)
Insert into Data_5061B_Load ( StationName, Parameter, Timestamp,Value,Units)
Select StationName, Parameter, Timestamp,Value, Units from cte2
WHERE not exists (
Select * From Data_5061B_Load a
Where a.stationname = cte2.stationname and a.parameter = cte2.parameter and a.timestamp =
cte2.timestamp
)
and nullif(value,'') is not null

END




GO
```