

Center for Surveillance, Epidemiology, and Laboratory Services
Division of Health Informatics and Surveillance



NSSP

National Syndromic
Surveillance Program

BioSense Platform

Center for Surveillance, Epidemiology, and Laboratory Services
Division of Health Informatics and Surveillance



Webinar to Introduce SAS Studio Basics

BioSense Platform: SAS Studio

Roseanne English

Analytic Data Management Lead

Max Worlund

Project Manager, ICF Contractor

Agenda

- Pilot Background and Lessons Learned
- SAS Studio Overview
- SAS Studio Setup
- Neat Features
- Code Examples
- Application Programming Interface (API) Call from ESSENCE
- Service Desk



Pilot Background and Lessons Learned

Pilot Background

- Conduct multiple rounds of pilot testing and feedback collection
- Conduct series of meetings:
 - Kick-off call: BioSense Platform, User Acceptance Testing, SAS Studio Orientation
 - Large query load test
 - Conference calls
- Collect feedback:
 - Online Epi-Info Survey
 - Bi-weekly conference calls



Feedback Collection (Online Survey)

- Four sections: Functionality, Usability, Performance of Tool, *BioSense Platform Quick Start Guide to Using SAS Studio*
- Results:
 - Need for IT staff to access system
 - Need for a redirect page
 - Duplicate shared folders
- Factors that affected ease of use:
 - Code error
 - Issues with runtime



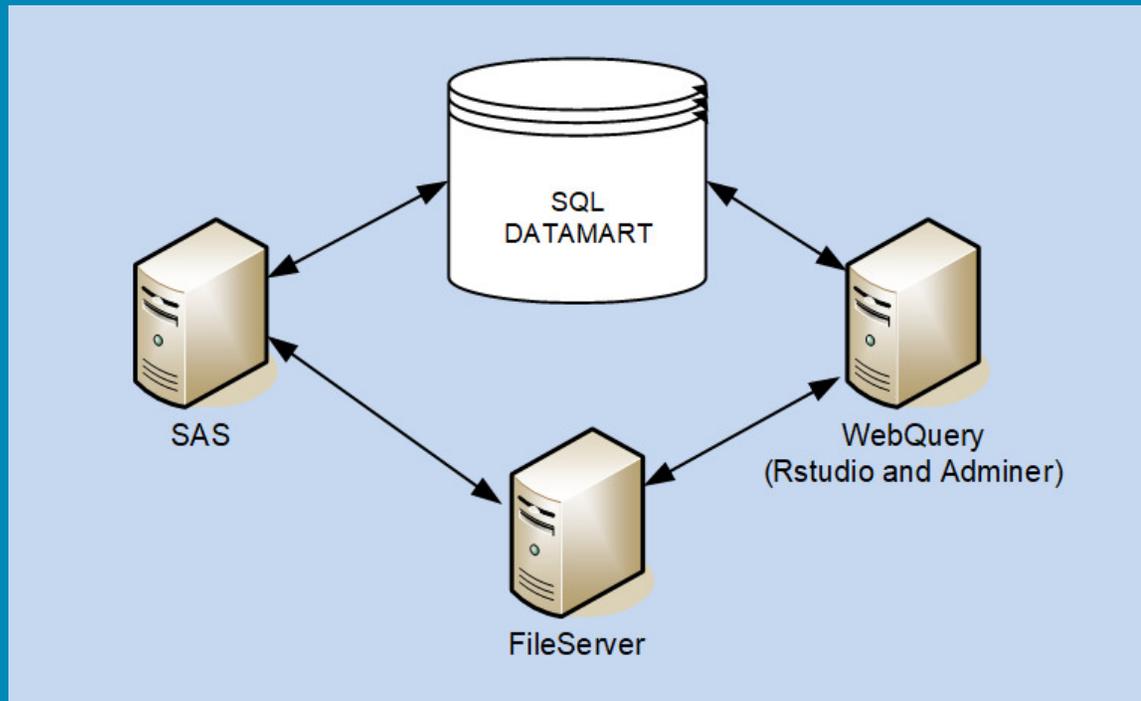
Feedback Collection (Online Survey) continued

- Recommendations:
 - Add redirect link for continuity across tools and improved navigation
 - Explore ways to relieve overtaxing of DataMart and determine whether code can be run on other servers
 - Reorganize quick start guide for better ease-of-use and understanding
- Action items completed:
 - ✓ Increase capacity of SQL DataMart, fileserver, and SAS servers
 - ✓ Update fileserver folder structure to delineate Home versus Read Only folders
 - ✓ Adjust SQL settings on DataMart to allocate more resources to ad-hoc queries and jobs
 - ✓ Add SAS Studio link to Access & Management Center (AMC)

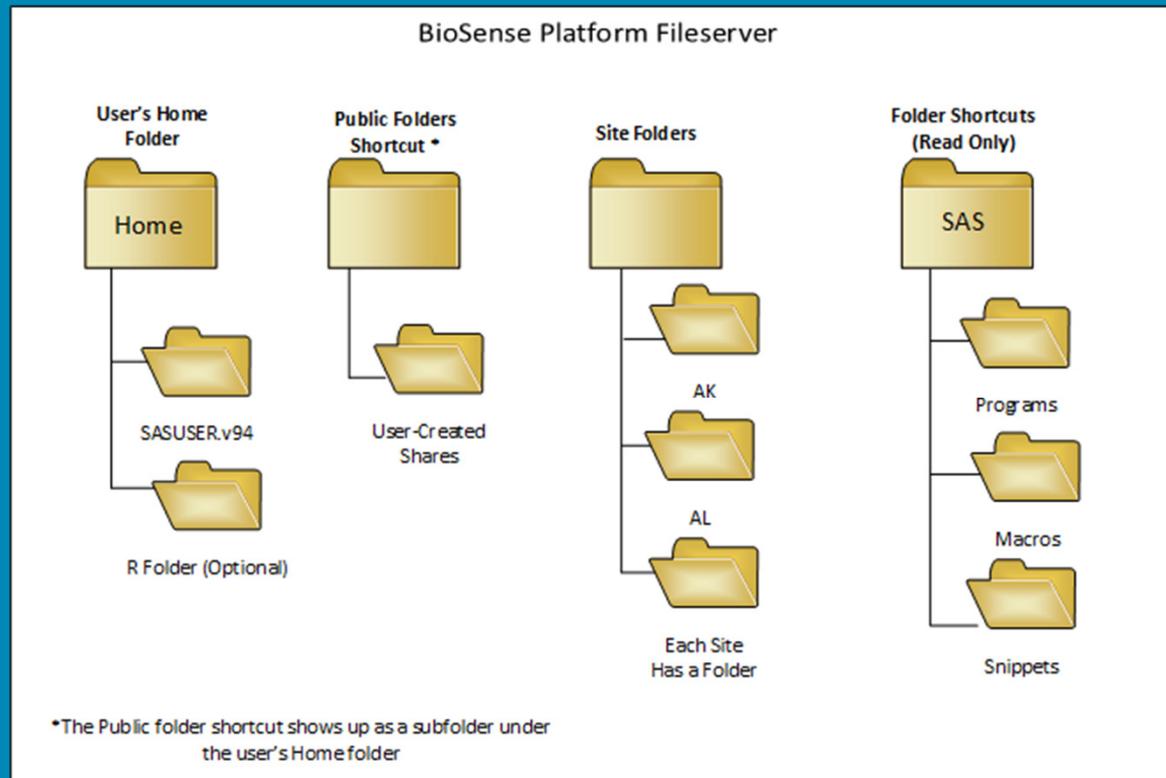


SAS Studio Overview

BioSense Platform Analysis Tools



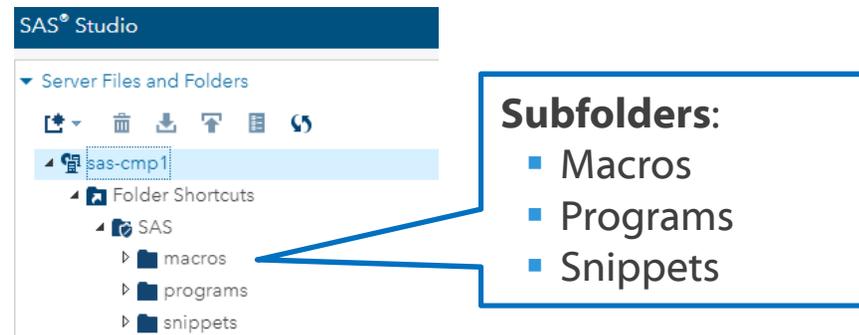
BioSense Platform Fileserver



SAS Studio Setup

First-time Use of SAS Studio

1. Locate the SAS folder shortcut and three subfolders.



2. Execute user profile macros (username, encrypted password, and site short name) and save to your home folder.
3. Set up and connect to user's shared site folder.
4. Connect to DataMart library.

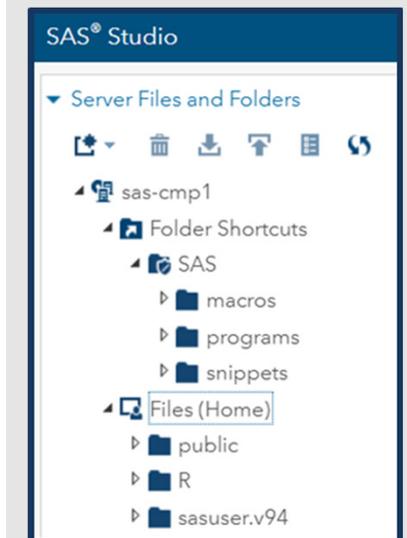
Note: Steps 2–4 are detailed in the following slides.



Use of Subfolders in SAS Folder Shortcut

- Macro folder contains:
 - SAS-specific macros required by programs
 - General interest macros for everyone's use
- Snippets folder contains essential (or useful) lines of code
- Programs folder contains:
 - Code written by NSSP for everyone's use
 - User-suggested code (submitted to Service Desk and approved by NSSP)

Tip: *Macros, programs, and snippets can be saved for modification or referenced directly by embedding the folder path and file name.*



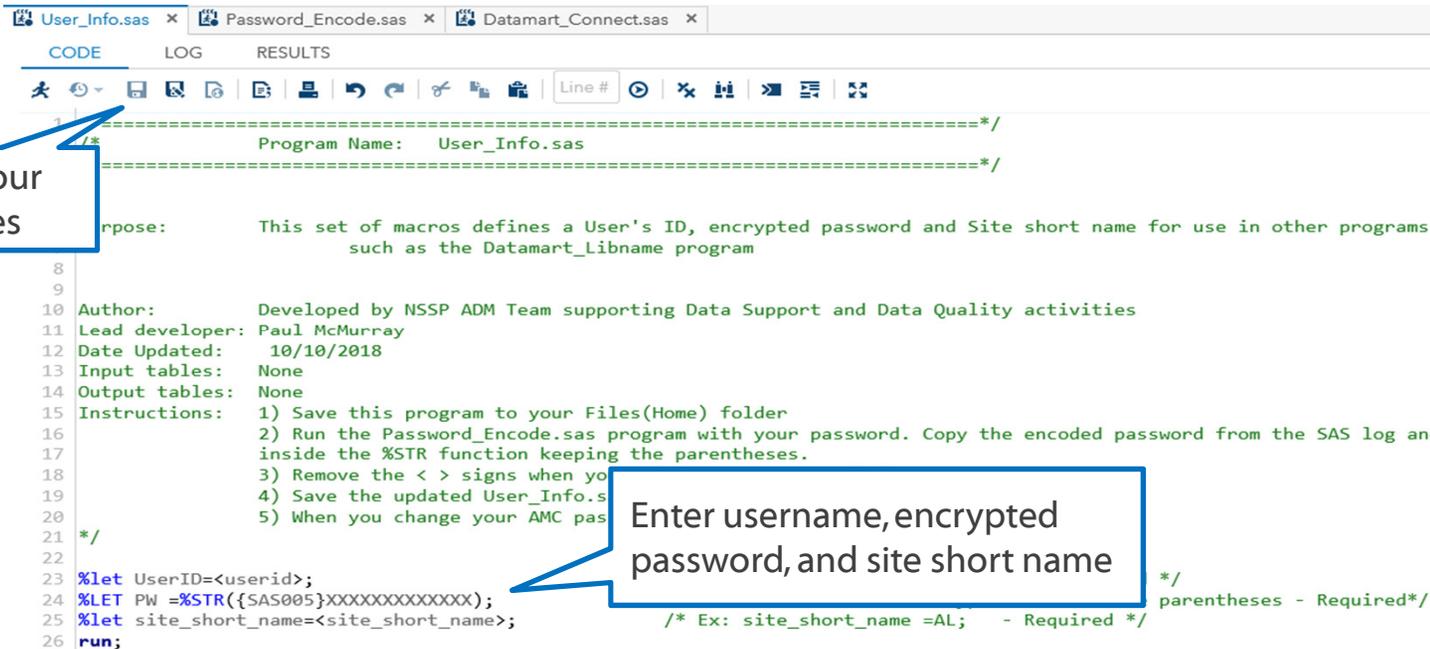
Password Encryption and User Information

- Use Chrome for SAS Studio (Internet Explorer *does not* support clipboard)
- Expand Global Snippets folder shortcut; open **User_Info.sas** program:
 - Save copy to Home folder
 - Enter your BioSense Platform username and site short name
- Expand Global Snippets folder shortcut; open **Password_Encode.sas** program
 - Enter your BioSense Platform password and run program
 - Go to SAS log and copy encrypted password
 - Paste encrypted password into your **User_Info.sas** program saved in your Home folder
 - Save copy to **User_Info.sas** and close **Password_Encode.sas** program



User_Info.sas (Required)

The “User_Info” snippet stores your username and encrypted password into macro variables.



The screenshot shows the SAS IDE interface with three tabs: User_Info.sas, Password_Encode.sas, and Datamart_Connect.sas. The 'CODE' tab is active, displaying the following SAS code:

```
1 -----*/
2 /*
3     Program Name:   User_Info.sas
4     -----*/
5
6 Purpose:           This set of macros defines a User's ID, encrypted password and Site short name for use in other programs
7                   such as the Datamart_Libname program
8
9
10 Author:           Developed by NSSP ADM Team supporting Data Support and Data Quality activities
11 Lead developer:   Paul McMurray
12 Date Updated:    10/10/2018
13 Input tables:    None
14 Output tables:   None
15 Instructions:    1) Save this program to your Files(Home) folder
16                  2) Run the Password_Encode.sas program with your password. Copy the encoded password from the SAS log and
17                  inside the %STR function keeping the parentheses.
18                  3) Remove the < > signs when you
19                  4) Save the updated User_Info.s
20                  5) When you change your AMC pas
21 */
22
23 %let UserID=<userid>;
24 %LET PW =%STR({SAS005}XXXXXXXXXXXX);
25 %let site_short_name=<site_short_name>;
26 run;
```

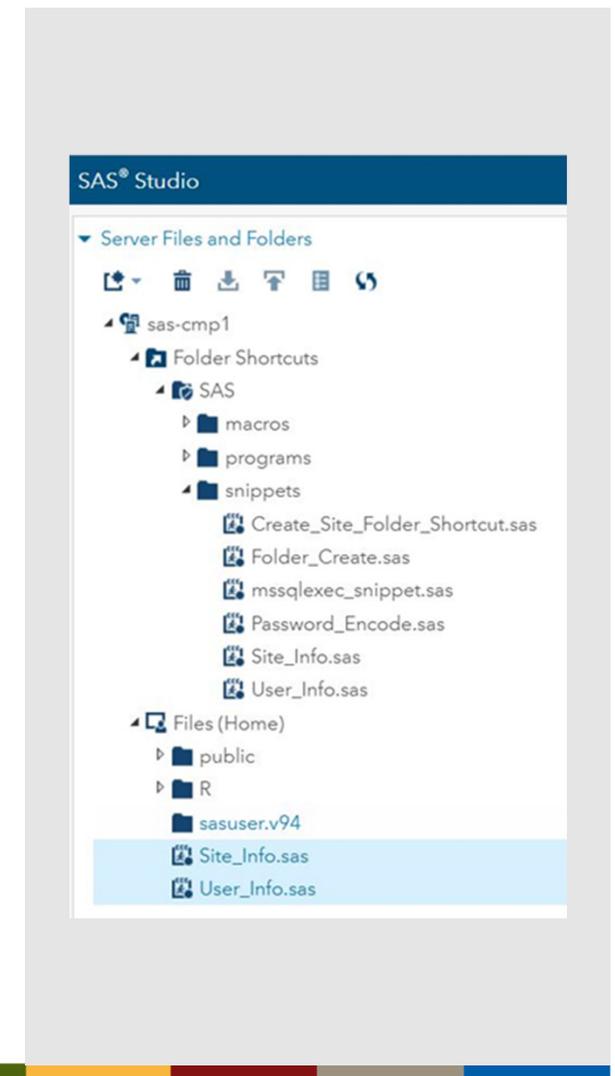
Annotations in the image include:

- A blue callout box on the left with the text "Save your changes" pointing to the top toolbar.
- A blue callout box on the right with the text "Enter username, encrypted password, and site short name" pointing to lines 23-25 of the code.



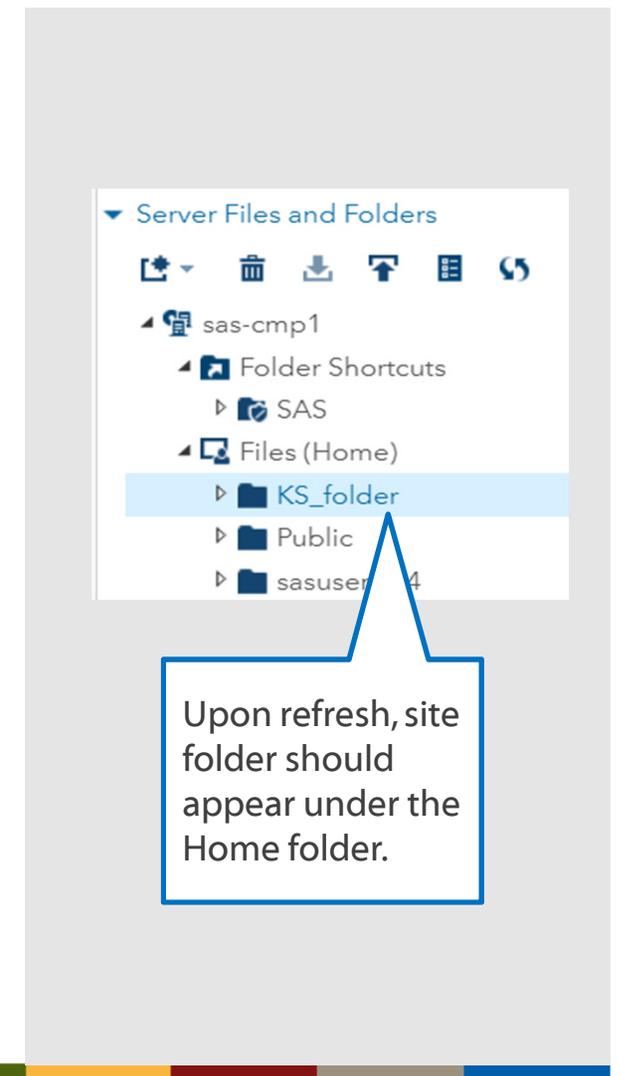
User_Info.sas (Required)

- Name snippet: **User_Info.sas**
- Save As to higher-level Home folder so that DataMart_Connect.sas program can find it
- Once saved, you should see the location for the User_Info.sas snippet (at right)



Create_Site_Folder_Shortcuts.sas (Recommended)

- Use the **Create_Site_Folder_Shortcut.sas** snippet to connect you to your site's shared folder
 - Open the **Create_Site_Folder_Shortcut.sas** snippet in the SAS Snippets folder, and then run the snippet
 - **Refresh the folder view**



DataMart_Connect.sas (Required)

- DataMart_Connect.sas program is default SAS Libname statement for connecting to DataMart (below).
- Run from global SAS Programs folder shortcut as stand-alone program or save to Home folder.

```
/*=====*/
/*          Program Name:  Datamart_Connect.sas
/*=====*/
/*Purpose: Executes the Datamart Connection statement to enable SAS users to query their Datamart data.
When run successfully the DATAMART library will show up under "My Libraries" in the panel to the left.

Author:          Developed by NSSP ADM Team
Lead developer: NSSP Team
Date Updated:    05/10/2018
Update Log:     Added "Site_info.sas"
Dependencies:    The User_Info.sas program must be stored in the proper location with the UserID and Password
*/

%include "/opt/sas/shared/homes/&sysuserid./User_Info.sas";
%include "/opt/sas/shared/homes/&sysuserid./Site_Info.sas";
run;

/*Datamart Libname statement */
LIBNAME DATAMART ODBC DATASRC=BioSense_Platform SCHEMA=dbo USER="&userid" PASSWORD="&pw" ;
```

Macros for
username and
password must
be defined by
User_Info.sas
snippet (in
Home folder)

Data Available Via DataMart Connection

- Same tables as in Adminer and RStudio Pro
- Production Raw, Processed, Exceptions, Exception_Reasons, Site Contacts, Master Facility Table (MFT), and Crosswalk Table
- Staging Production Raw, Processed, Exception_Reasons, and MFT and Crosswalk Tables
- Metadata Tables:
 - Filtered_Reasons
 - Exception_Reasons



Neat Features

AMC Access to SAS Studio

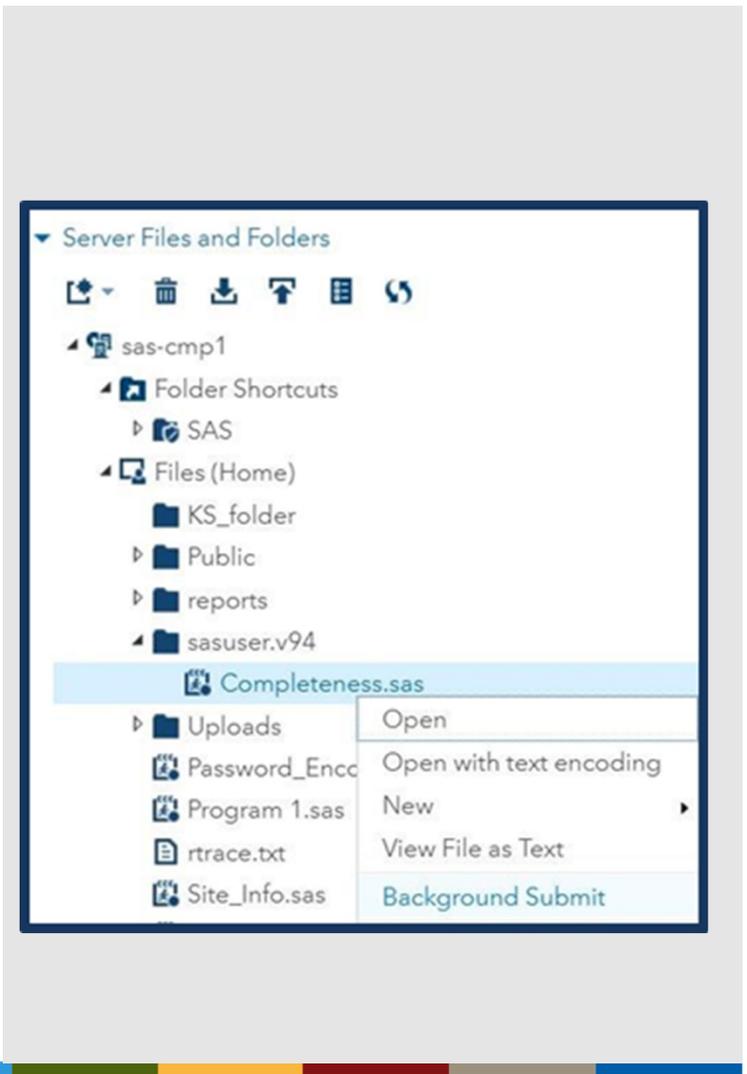
- Site administrators may give access to SAS Studio simply by checking box on user's Account Information page
- In this release, the site administrator must check the box to initiate notification email
- User will be notified via email once access to SAS Studio is complete

NSSP plans to automate this process

The screenshot displays the 'ACCOUNT INFORMATION' page. At the top, there are radio buttons for 'Active' (selected) and 'Inactive'. To the right are buttons for 'Reset User Password' and 'Unlock ALL Accounts'. Below these are input fields for 'AMC Password Status', 'AD Password Status', 'ESSENCE Password Status', and 'AMC Password Expiration Date', all containing the text 'New'. The 'ESSENCE National View Controls' section includes checkboxes for 'National View' and 'Chief Complaint Query Validation Tool (CCQVT)'. The 'Database Access' section has a checkbox for 'Datamart (Site Level Access)' with a note: 'Adminer access is automatically assigned.' The 'Application Access' section includes checkboxes for 'Adminer', 'R Studio*', and 'SAS Studio*'. The 'SAS Studio*' checkbox is highlighted with a red box, and a note below it reads: '*For user access to site-level SQL data, also select Datamart.'

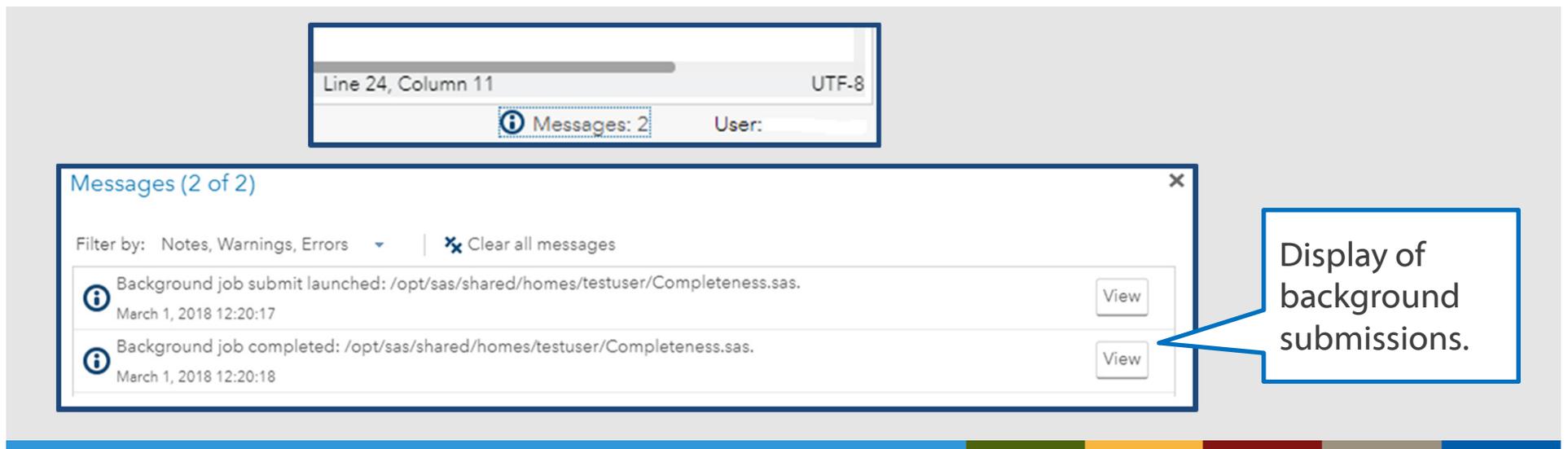
Background Submission: SAS Code

- Users may perform Background Submit of SAS code
- Code submitted in background will run while user does other SAS programming (helpful during long-running SAS projects)
- To perform a Background Submit:
 1. Save changes to SAS code to Home or other folder
 2. Right click on program you want to submit, and choose “Background Submit”



Background Submission: SAS Code (continued)

- When job is Background Submitted, SAS Studio will display pop-up message box in lower right-hand corner of screen to show job is running.
- To monitor box, click Message icon to see job status and access SAS Log.



The screenshot displays the SAS Studio interface. At the top, a code editor window shows 'Line 24, Column 11' and 'UTF-8'. Below it, a 'Messages: 2' icon is highlighted. A 'Messages (2 of 2)' pop-up window is open in the lower right corner, showing two messages:

- Background job submit launched: /opt/sas/shared/homes/testuser/Completeness.sas. (March 1, 2018 12:20:17)
- Background job completed: /opt/sas/shared/homes/testuser/Completeness.sas. (March 1, 2018 12:20:18)

Each message has a 'View' button. A callout box points to the 'View' button of the second message, stating: 'Display of background submissions.'

Code Examples

Proc SQL—Data_Connection_Basics

Data_Connection_Basics.sas has 3 ways to connect to data on BioSense Platform:

1. SQL Pass-Through
2. Proc SQL
3. SAS Libname statement

```
/** PROC SQL **/  
/** PROC SQL approach results in submission of SQL code directly on the SAS server, using the SQL data on the SQL server.  
**/  
  
%include "/opt/sas/shared/repository/programs/Datamart_Connect.sas";  
  
%let sp=&site_short_name.;  
%let stdate = '01Jan2018'd;  
%let endate = '31Jan2018'd;  
  
proc sql noprint;  
create table demo2 as  
select a.C_Biosense_Facility_ID, Facility_Name, count(*) as Records  
from datamart.&sp._PR_Processed a inner join datamart.&sp._MFT b on a.C_Biosense_Facility_ID=b.C_Biosense_Facility_ID  
where Primary_Facility='Y' and Arrived_Date between &stdate. and &endate.  
group by a.C_Biosense_Facility_ID, Facility_Name;  
quit;
```

Sample of SAS Proc SQL pass-through. Arrows indicate macro variables defined for User ID and password in User_Info.sas snippet.

Data_Connection_Basics.sas (continued)

SAS Proc SQL example query produces the same output as the previously shown SQL pass-through procedure. However, this program works *only* if the DataMart_Connect.sas program is run first.

```
%let sp=&site_short_name.;
%let stdate = '2018-01-01';
%let endate = '2018-01-31';

create table demo1 as
select *
/* The section below is the SQL Pass through */
from connection to odbc
(
select a.C_Biosense_Facility_ID, Facility_Name, count(*) as Records
from &sp._PR_Processed a inner join &sp._MFT b on a.C_Biosense_Facility_ID=b.C_Biosense_Facility_ID
where Primary_Facility='Y' and Arrived_Date between %bquote(&stdate.) and %bquote(&endate.)
group by a.C_Biosense_Facility_ID, Facility_Name);
disconnect from odbc;
quit;
```

For Proc SQL, you
MUST run the
Datamart_Connect.
sas program first.

Data_Connection_Basics.sas (continued)

You may apply a SAS data-step program (below) to produce same output as preceding SQL programs. Program works ONLY if DataMart_Connect.sas program is run. The DataMart_Connect program creates the SAS Libname statement.

```
/** SAS Libname Connection **/  
/** SAS Data Step and proc freq **/  
/** Example: SAS example below produces the same output as the SQL programs above, using only SAS procedures.  
    Datamart_Connect.sas program must be run first since the program is using the DATAMART library.  
**/  
|  
%include "/opt/sas/shared/repository/programs/Datamart_Connect.sas";  
  
%let sp=&site_short_name.;  
%let stdate = '01Jan2018'd;  
%let endate = '31Jan2018'd;  
  
data d1;  
set datamart.&sp._PR_Processed (keep=C_Biosense_Facility_ID Arrived_Date);  
where Arrived_Date between &stdate. and &endate.;  
run;  
  
proc freq data=d1;  
tables C_Biosense_Facility_ID /out=d2;  
run;
```



SAS libref
created is
"datamart."

API Call from ESSENCE

API Call from ESSENCE

- Navigate to ESSENCE Home page and select Query Portal
- Create and run desired ESSENCE Query, which takes you to query results
- Use ESSENCE API URL button to open the API URL
 - ESSENCE API URL will have embedded ampersand (&) requiring quotation marks to “escape” (“&”)
 - ESSENCE API URL may need to be broken into shorter strings for SAS to process

For an example, see the [ESSENCE_Download.sas](#) program



API Call from ESSENCE

Home | Alert List | myAlerts | myESSENCE | Event List | Overview Portal | Query Portal | Stat Table | Map Portal | Bookmarks | Query Manager | Data Quality | Report Manager | Admin Portal | More

+ Description
- Query Options

Query name: Save Query Create myAlert Save Report Query

Add to myESSENCE Share URL **API URLs** Show SQL Query

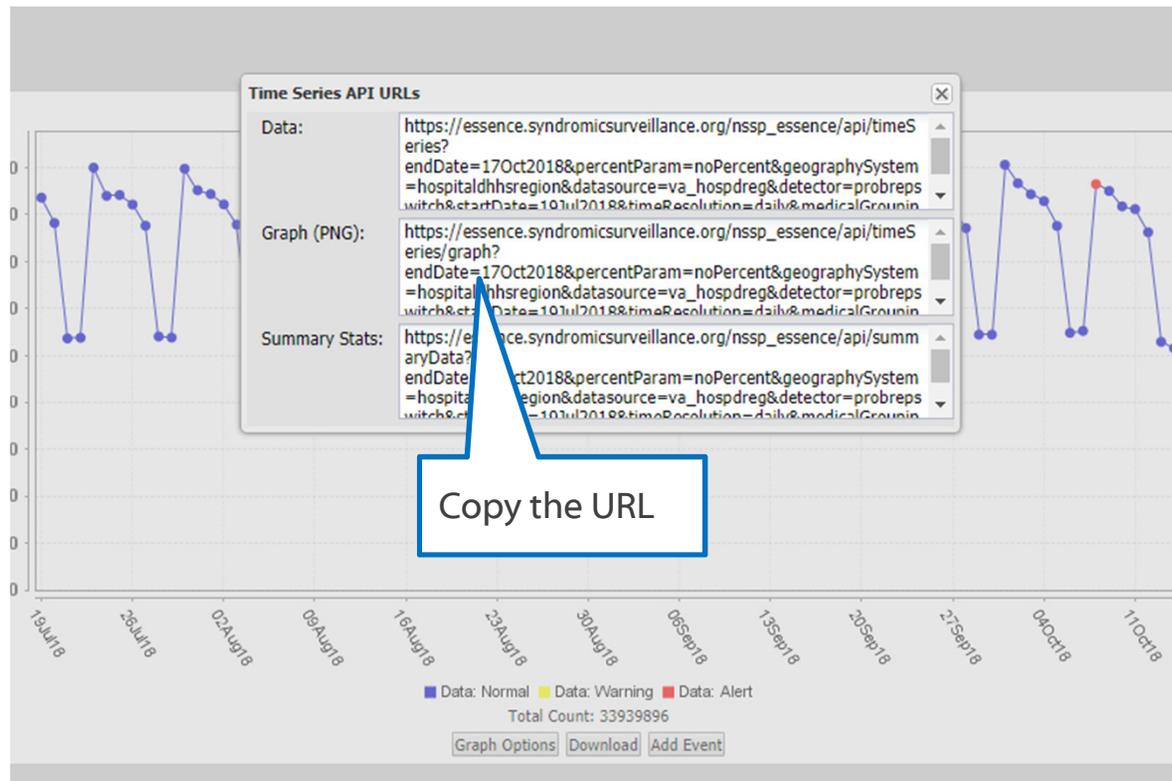
+ Configuration Options
+ Data Series Options
- Graph

Click the API URL button

Daily Data Counts

■ Data: Normal ■ Data: Warning ■ Data: Alert
Total Count: 33939896
Graph Options | Download | Add Event

API Call from ESSENCE



API Call from ESSENCE

```
CODE LOG RESULTS
1 /*=====*/
2 /* Program Name: ESSENCE_Download.sas */
3 /*=====*/
4 /* Please Save this program to your local SAS Home or other folder before running
5
6 Required Changes:
7 1) Enter the desired start and end dates (stdt, enddt)
8 2) Log into ESSENCE and locate your ESSENCE User ID (uid) number replace the XXX below with your ESSENCE UserId
9 */
10
11 /* Update stdt (start visit date), endt (end visit date) and uid (ESSENCE User ID) macros as needed.
12 Your ESSENCE user ID can be found within the URL of ESSENCE that were created any time after running ESSENCE query.
13 Once you run ESSENCE query example timeliness graph, please look for the word "&userId=". Your ESSENCE user ID is
14 the number after the word "&userId=*/
15
16 *let stdt=12Mar2018; /* Change visit start date here */
17 %let endt=14Mar2018; /* Change visit end date here */
18 %let uid=XXX; /* Change your essence user ID here. This will be 3-4 digits */
19
20 %let essURL=https://essence.syndromicsurveillance.org/nssp_essence/servlet/PlainDataDetailsServlet?endDate=&endt.;
21 %let essURL2= %nrstr(&percentParam)=noPercent%nrstr(&geographySystem)=hospital%nrstr(&datasource)=va_hosp%nrstr(&detector)=probprepswitch
22 %nrstr(&)startDate=&stdt.;
23 %let essURL3= %nrstr(&)timeResolution=daily%nrstr(&medicalGroupingSystem)=essencesyndromes%nrstr(&userId)=&uid.%nrstr(&site)=&site_id.
24 %nrstr(&target=datadetails);
25 %let essenceURL = "%essURL.&essURL2.&essURL3.";
26
27 filename fname url &essenceURL.
28 user="&UserID" pass="&PW";
29 filename outr "&dir./data/ess_data.txt";
30 data _Null_;
31 infile fname length=len;
32 input record $varying4000. len;
33 file outr;
34 put record $varying4000. len;
35 run;
36
```

- 1. Start and End Date
- 2. UID=XXX



Service Desk

http://support.syndromicsurveillance.org

Service Desk
NSSP Service Desk

MFT Lat/Long URL broken - 9/24/2018

For Site Admins: The web page hyperlink in the AMC for facility lat/long look ups has been changed or gone offline. We will update the link in the AMC as soon as possible. In the meantime, please use:
<https://geocoding.geo.census.gov/geocoder/locations/address?form> to find the coordinates for your facilities

Welcome to the NSSP Service Desk! You can submit a technical assistance request through this portal at any time.

- AMC
- Adminer
- ESSENCE
- RStudio
- SAS Studio**

-  **SAS Analysis Support**
SAS specific questions for syndromic surveillance
-  **SAS Login and Connection Issues**
SAS login errors and connection issues
-  **SAS Studio Problem Report**
SAS problem report not related to logging in.

Select SAS Studio link and service option

Questions?



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

