

NEWDat Tool for PAMS Data Validation and Analysis

Jennifer DeWinter
Sonoma Technology, Inc.
Petaluma, CA

for

National Ambient Air Monitoring Conference
Atlanta, GA

August 11, 2014



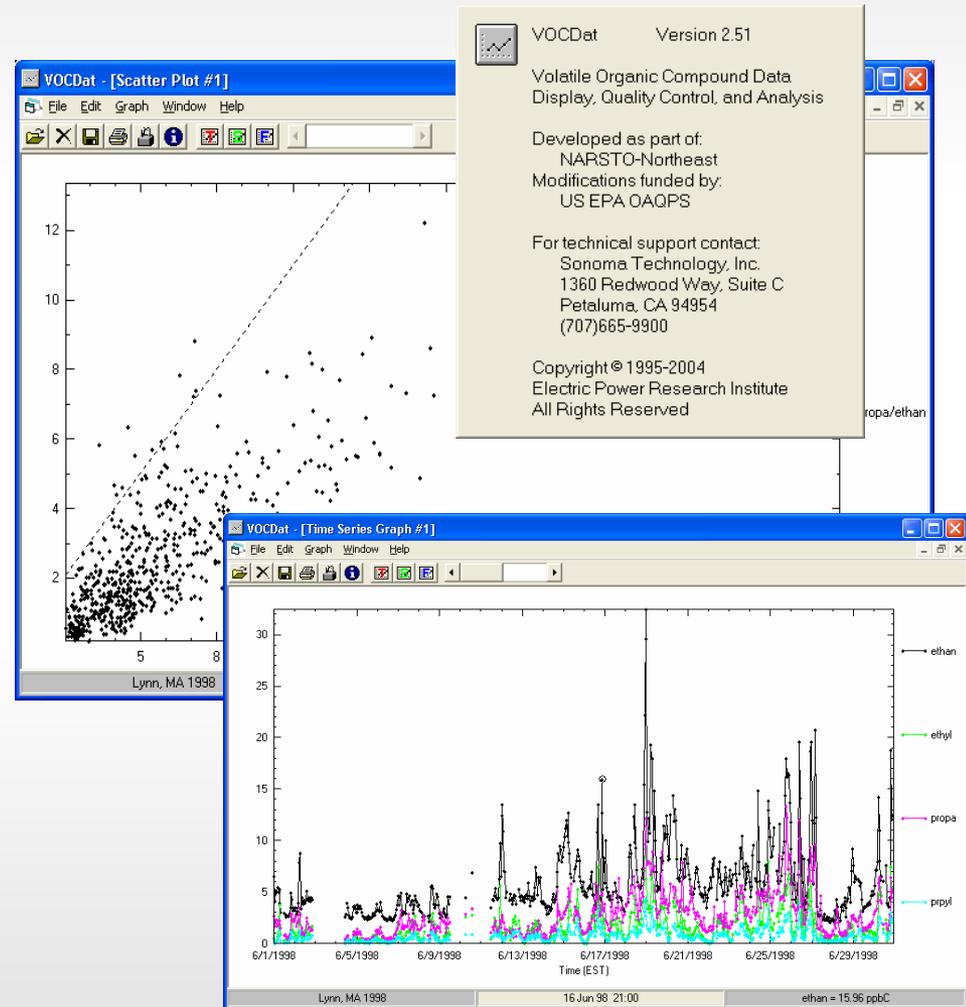
Sonoma Technology, Inc.

Glossary

Term	Definition
ANT	AirNow-Tech
AQS	Air Quality System
Auto-GC	Automated Gas-Chromatograph
EPA	Environmental Protection Agency
NACAA	National Association of Clean Air Agencies
PAMS	Photochemical Assessment Monitoring Stations
PM _{2.5}	Particulate Matter smaller than 2.5 micrometers
STI	Sonoma Technology, Inc.
VOC	Volatile Organic Compounds

Outline

- Overview
- Getting Started
- Live Demonstration
- Next Steps



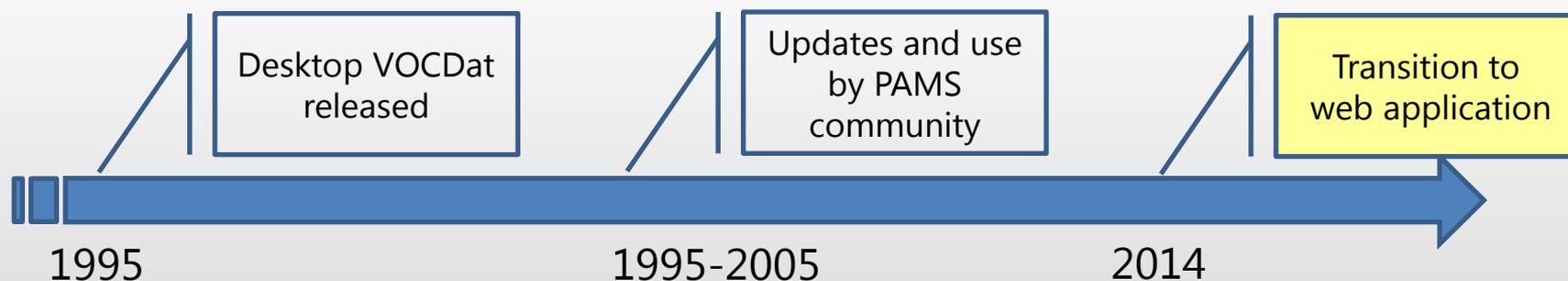
What Is VOCDat?

- A desktop software program c. 1995
- Used by PAMS community to validate VOC data and prepare data for AQS submission
- Used to analyze carbonyls, air toxics, and speciated PM_{2.5}



Motivation to Update VOCDat

- Evolution of desktop operating systems
- New types of auto-GC instruments
- Transition to web-based application
- Extension of existing infrastructure



Benefits of Web Applications

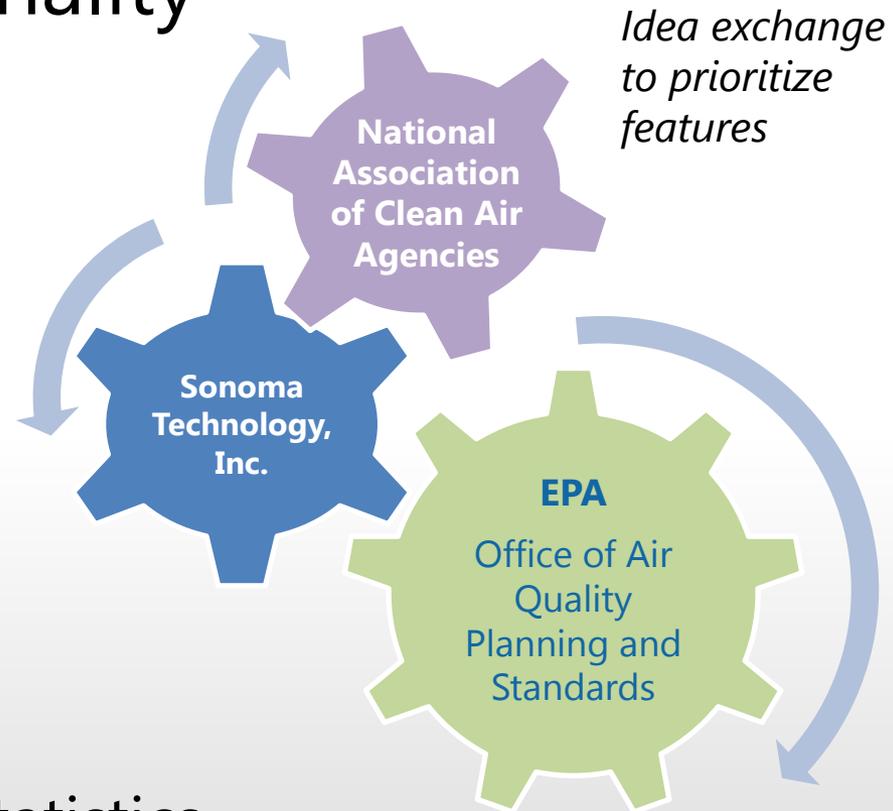
- Reduced hardware requirements
- No downloads or installation
- Centralized updates
- Improved data retention and security
- Collaboration, sharing, and publishing
- AirNow-Tech Integration
- Acquire data from other online systems (AQS, AirNow)

Initial Development Phase

November 2013 – September 2014

Develop the core functionality

- AQS requests
- File uploads
- Unit conversion
- Data aggregations
- Time series and data editing
- Scatter plots
- Bar charts (fingerprint)
- Screening checks
- Data exports and summary statistics



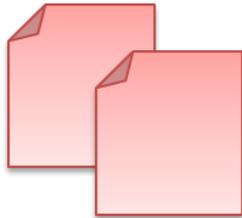
New VOCDat Design

EPA Data Mart

- VOC, speciated PM, air toxics
- Meteorological data
- Ozone, PM mass, NOx, etc.

Data Mart web service:
Select site, species category, date range

User Data Files



- AQS, PerkinElmer (*.tx0), csv crosstab
- Single site at a time
- Limited date range

VOCDat Website

- Accessible from AirNow-Tech
- Import raw data files
- Request AQS data from Data Mart
- Edit null data codes
- View time series & scatter plots
- Screen data not meeting user-specified criteria
- Query data below MDL
- Output summary statistics
- Output AQS files

Output Files



- Data in AQS, csv crosstab format
- Summary statistics, screening results in .csv
- Save high-resolution graph images

Data Management System

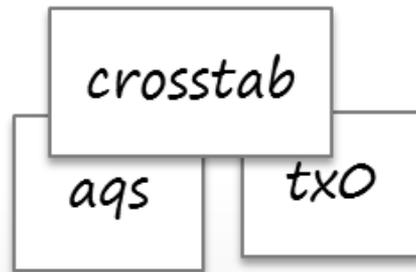
- Store user-specific data; delete after 6 months
- Calculate basic statistics, sum of values, etc.
- Perform unit conversions via lookup table

General Workflow in VOCDat

1

Add data to
VOCDat

Data Dashboard



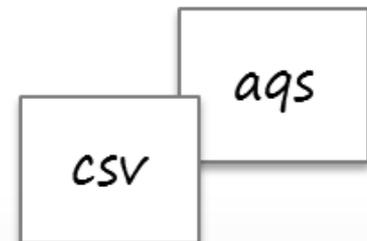
2

Explore data with
graphs

3

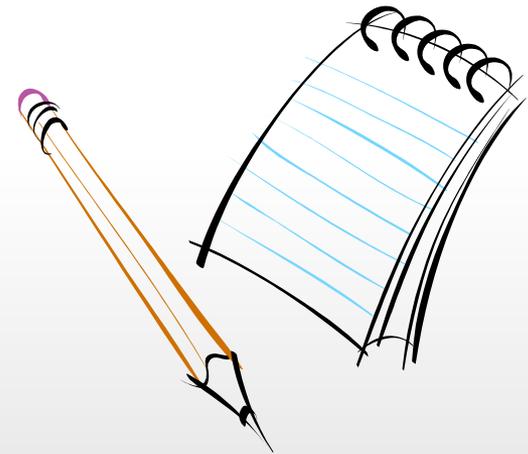
Export data
and statistics

Data Export



Next Steps (1)

- Complete testing and release to AirNow-Tech
- Review feedback forms
- Identify & prioritize features for future phases
- Decide on a new name!



VOCDat release planned for late August!

Next Steps (2)

Original VOCDat	New VOCDat (Phase 1)
Import data (AQS, TX0, ASCII)	
Export data (AQS, csv)	
Calculate aggregates (aromatics, carbonyls, paraffins, olefins, unidentified, sum of target compounds)	
Prepare data graphs (time series, scatter plot, fingerprint plot)	
Perform on-screen editing of data qualifier and null codes	
Perform QC screening checks	
Graph in elution order	
Easily change parameters on time series	
Convert units on graphs	
Apply user-defined scaling factors	
Calculate weight percent	

Next Steps (3)

Additional feature ideas from user feedback

- Data tables
- Additional import/export file formats
- Append to existing data sets
- Import multiple sites at once
- Secondary Y-Axis on time series
- Regression equations on scatter plot
- Edit data from scatter plot
- Custom aggregates on demand
- Stacked bar graphs
- Collocated/replicate data and precision/bias statistics
- Save graph setting for future use
- And more!

ATAQDat
(Analysis Tool for Air
Quality Data)

ADAPT
(Air Data Analysis
Program Tool)

MyDat

?



?

Aeris

MyAirDat

Contact

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Jennifer DeWinter

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Getting Started with VOCDat

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Background

- VOCDat was originally developed for the PAMS community to validate VOC data and prepare data for AQS submission.
- VOCDat was also used to analyze carbonyls, air toxics, and speciated PM_{2.5}.
- Evolution of desktop operating systems motivated the transition to a web-based application.



To access VOCDat you must log in to AirNow-Tech. Use an Internet browser to navigate to <http://airnowtech.org>. This takes you to the AirNow-Tech home page.

The screenshot shows the AirNow-Tech website interface. At the top left is the AirNow Tech logo. To the right is a 'Log In' link. Below the logo is a navigation menu with the following items: Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, Resources.

The main content area is divided into two columns. The left column contains an 'About' section and a 'News and Events' section. The right column contains a 'Polling Summary' section.

About

AirNow-Tech is a password-protected website for air quality data management analysis, and decision support. AirNow-Tech is primarily used by the federal, State, Tribal, and local air quality organizations that provide data and forecasts to the AirNow system, as well as researchers and other air data users. It allows users to:

- Access monitoring site data, information, and polling status
- Analyze current and past air quality events and episodes
- Submit and analyze air quality forecasts
- Configure EnviroFlash email services for public dissemination of air quality forecasts
- View meteorological and air quality data
- Generate data reports
- Create GIS-based maps with air quality and meteorological conditions
- Sign up for the AirNow Notifier listserv

[Register for an AirNow-Tech Account](#)

[A comprehensive list of EPA air pollution data sources](#)

[Register with AirNow API for an automatic feed of AirNow air quality data](#)

News and Events

No news events currently available.

Polling Summary

Color Legend

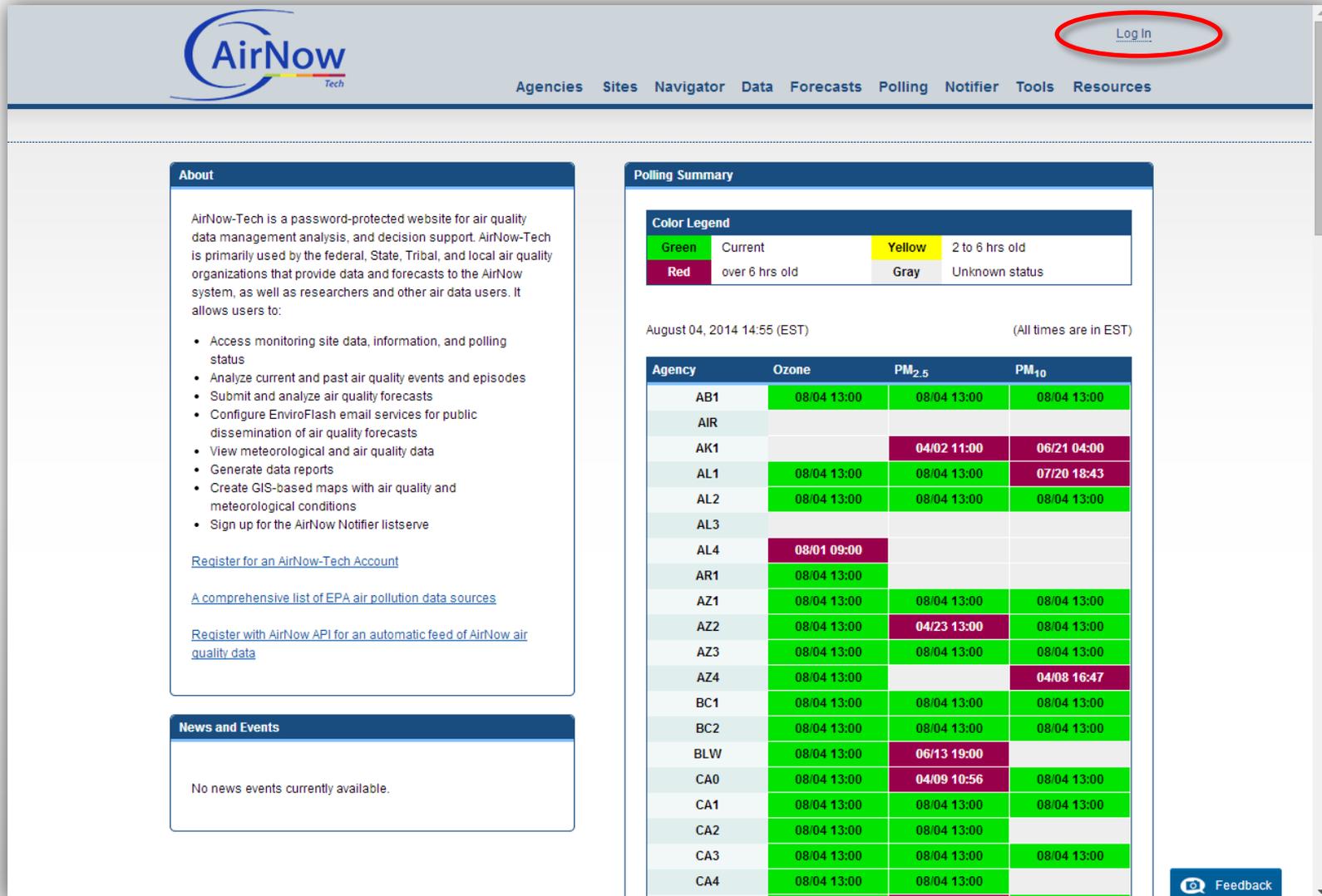
Green	Current	Yellow	2 to 6 hrs old
Red	over 6 hrs old	Gray	Unknown status

August 04, 2014 14:55 (EST) (All times are in EST)

Agency	Ozone	PM _{2.5}	PM ₁₀
AB1	08/04 13:00	08/04 13:00	08/04 13:00
AIR			
AK1		04/02 11:00	06/21 04:00
AL1	08/04 13:00	08/04 13:00	07/20 18:43
AL2	08/04 13:00	08/04 13:00	08/04 13:00
AL3			
AL4	08/01 09:00		
AR1	08/04 13:00		
AZ1	08/04 13:00	08/04 13:00	08/04 13:00
AZ2	08/04 13:00	04/23 13:00	08/04 13:00
AZ3	08/04 13:00	08/04 13:00	08/04 13:00
AZ4	08/04 13:00		04/08 16:47
BC1	08/04 13:00	08/04 13:00	08/04 13:00
BC2	08/04 13:00	08/04 13:00	08/04 13:00
BLW	08/04 13:00	06/13 19:00	
CA0	08/04 13:00	04/09 10:56	08/04 13:00
CA1	08/04 13:00	08/04 13:00	08/04 13:00
CA2	08/04 13:00	08/04 13:00	
CA3	08/04 13:00	08/04 13:00	08/04 13:00
CA4	08/04 13:00	08/04 13:00	

[Feedback](#)

To enter, choose **Log In** in the upper right corner of the main page, above the navigation options.



The screenshot shows the AirNow-Tech website interface. At the top left is the AirNow-Tech logo. In the top right corner, the 'Log In' link is circled in red. Below the logo is a navigation menu with the following items: Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, Resources.

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AL2	08/04 13:00	08/04 13:00	08/04 13:00
AL3			
AL4	08/01 09:00		
AR1	08/04 13:00		
AZ1	08/04 13:00	08/04 13:00	08/04 13:00
AZ2	08/04 13:00	04/23 13:00	08/04 13:00
AZ3	08/04 13:00	08/04 13:00	08/04 13:00
AZ4	08/04 13:00		04/08 16:47
BC1	08/04 13:00	08/04 13:00	08/04 13:00
BC2	08/04 13:00	08/04 13:00	08/04 13:00
BLW	08/04 13:00	06/13 19:00	
CA0	08/04 13:00	04/09 10:56	08/04 13:00
CA1	08/04 13:00	08/04 13:00	08/04 13:00
CA2	08/04 13:00	08/04 13:00	
CA3	08/04 13:00	08/04 13:00	08/04 13:00
CA4	08/04 13:00	08/04 13:00	

[Feedback](#)

To login, enter the credentials for an existing AirNow-Tech account and choose **Log In** or **Request an AirNow-Tech Account**.

Please log in to use AirNow-Tech

Username:

Password:

[Log In](#) [Forgot your password?](#)

[Request an AirNow-Tech Account](#)

[Feedback](#)

To enter VOCDat, choose **VOCDat** from the **Tools** menu in the navigation options.

The screenshot shows the AirNow-Tech website interface. At the top, the AirNow-Tech logo is on the left, and a navigation menu is on the right. The 'Tools' menu item is circled in red. Below the navigation menu, there are two main content areas: 'About' and 'Polling Summary'.

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AL3			
AL4	08/01 09:00		
AR1	08/04 13:00		
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AZ2	08/04 13:00	04/23 13:00	08/04 13:00
AZ3	08/04 13:00	08/04 13:00	08/04 13:00
AZ4	08/04 13:00		04/08 16:47
BC1	08/04 13:00	08/04 13:00	08/04 13:00
BC2	08/04 13:00	08/04 13:00	08/04 13:00
BLW	08/04 13:00	06/13 19:00	
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CA1	08/04 13:00	08/04 13:00	08/04 13:00
CA2	08/04 13:00	08/04 13:00	
CA3	08/04 13:00	08/04 13:00	08/04 13:00
CA4	08/04 13:00	08/04 13:00	

[Feedback](#)

On your first visit, you will see the VOCDat Welcome page, to which you can return by clicking **VOCDat** at the top of any page.

[Welcome, Jennifer DeWinter!](#) | [My Account](#) | [Contact Us](#) | [Log Out](#)

[Agencies](#) | [Sites](#) | [Navigator](#) | [Data](#) | [Forecasts](#) | [Polling](#) | [Notifier](#) | [Tools](#) | [Resources](#)

VOCDat [Manage](#) | [Explore](#) | [Export](#) | [Help](#)

Welcome to VOCDat, your personal platform for air quality data validation and analysis!

Here's how to get started...

1 Add data to VOCDat

Upload your AQS, crosstab or TXO-formatted files to store your data in the VOCDat server

2 Explore data with graphs

[Feedback](#)

To navigate VOCDat, use the **Manage**, **Explore**, **Export**, or **Help** links that appear at the top of each screen.

[Welcome, Jennifer DeWinter!](#) | [My Account](#) | [Contact Us](#) | [Log Out](#)

[Agencies](#) | [Sites](#) | [Navigator](#) | [Data](#) | [Forecasts](#) | [Polling](#) | [Notifier](#) | [Tools](#) | [Resources](#)

VOCDat

[Manage](#) | [Explore](#) | [Export](#) | [Help](#)

Welcome to VOCDat, your personal platform for air quality data validation and analysis!

Here's how to get started...

- ### 1 Add data to VOCDat

Upload your AQS, crosstab or TXO-formatted files to store your data in the VOCDat server
- ### 2 Explore data with graphs

[Feedback](#)

To get started using VOCDat, choose **Add data to VOCDat** from the Welcome screen or click **Manage**, then **add data**.

The screenshot shows the AirNow Tech VOCDat interface. At the top, there is a navigation bar with the AirNow Tech logo on the left and a welcome message 'Welcome, Jennifer DeWinter!' followed by links for 'My Account', 'Contact Us', and 'Log Out'. Below the navigation bar, there is a menu with 'Agencies', 'Sites', 'Navigator', 'Data', 'Forecasts', 'Polling', 'Notifier', 'Tools', and 'Resources'. The main content area is titled 'VOCDat' and includes a 'Manage' button circled in red, along with 'Explore', 'Export', and 'Help' links. A welcome message reads 'Welcome to VOCDat, your personal platform for air quality data validation and analysis!'. Below this, it says 'Here's how to get started...'. The first step, '1 Add data to VOCDat', is circled in red. A diagram illustrates the process: a computer monitor icon points to a stack of files labeled 'AQS' and 'TXO', with a 'crosstab' file icon in between. An arrow then points to a database cylinder icon with a checkmark. Below the diagram, the text reads 'Upload your AQS, crosstab or TXO-formatted files to store your data in the VOCDat server'. The second step, '2 Explore data with graphs', is partially visible at the bottom. A 'Feedback' button is located in the bottom right corner.

1 Add data to VOCDat

Upload your AQS, crosstab or TXO-formatted files to store your data in the VOCDat server

2 Explore data with graphs

Two options are available for adding data to VOCDat: file **Upload** and making an **AQS Request**.

The screenshot displays the AirNow Tech VOCDat interface. At the top, the AirNow Tech logo is on the left, and the user's name 'Welcome, Jennifer DeWinter!' with links for 'My Account', 'Contact Us', and 'Log Out' is on the right. A navigation menu includes 'Agencies', 'Sites', 'Navigator', 'Data', 'Forecasts', 'Polling', 'Notifier', 'Tools', and 'Resources'. The main heading is 'VOCDat', with a 'Manage' link circled in red. Below this, an 'Options' section contains 'Upload' and 'AQS Request' links, both circled in red. The 'UPLOAD A FILE' section includes a 'Data Set Name' text input, a 'File Type' dropdown menu set to 'AQS', and dropdown menus for 'State', 'County', and 'Site'. At the bottom of this section are 'Choose Files' (showing 'No file chosen') and 'Upload Data' buttons. A 'Feedback' button is located in the bottom right corner.

To upload your own data files, select **Upload** from the menu of options and then complete the form.

The screenshot shows the AirNow Tech VOCDat interface. At the top, the AirNow Tech logo is on the left, and a navigation bar contains 'Agencies', 'Sites', 'Navigator', 'Data', 'Forecasts', 'Polling', 'Notifier', 'Tools', and 'Resources'. A user greeting 'Welcome, Jennifer DeWinter!' is followed by links for 'My Account', 'Contact Us', and 'Log Out'. Below the navigation bar, the 'VOCDat' section has a sub-menu with 'Manage', 'Explore', 'Export', and 'Help'. The 'Options' section on the left has 'Upload' selected, with 'AQS Request' as a sub-option. The main form is titled 'UPLOAD A FILE' and includes the following fields: 'Data Set Name' (text input), 'File Type' (dropdown menu with 'AQS' selected), 'State' (dropdown menu), 'County' (dropdown menu), and 'Site' (dropdown menu). Below these fields are 'Choose Files' (with 'No file chosen') and 'Upload Data' buttons. A 'Feedback' button is located at the bottom right of the page.

Upload data in AQS format, crosstab format, or Perkin Elmer (*.tx0) format.

Data in VOCDat are stored in data sets. name your data set first.

Upload your file with this button. Check the status by clicking **Manage**.

To add AQS data to VOCDat, choose **AQS Request** from the menu of options and then complete the form.

The screenshot shows the AirNow Tech VOCDat interface. The top navigation bar includes the AirNow Tech logo, a user welcome message, and links for My Account, Contact Us, and Log Out. Below this is a main navigation menu with items: Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, and Resources. The VOCDat section has a sub-menu with 'Manage', 'Explore', 'Export', and 'Help'. The 'Options' menu on the left has 'AQS Request' selected. The 'AQS DATA REQUEST' form contains the following fields:

- Data Set Name:
- State:
- County:
- Site:
- Parameter Class:
- Parameter:
- Duration:
- Date Range: to

At the bottom of the form is a 'Request' button. A 'Feedback' button is located in the bottom right corner.

Data in VOCDat are stored in data sets. Name your data set first.

Make your request with this button. Check the status by clicking **Manage.**

The **Manage** page provides a summary of the data sets you have uploaded or requested from AQS. Add more data with the **add data** link.

The screenshot shows the AirNow Tech interface for the VOCDat Manage page. The top navigation bar includes links for Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, and Resources. The user is logged in as Jennifer DeWinter. The page title is VOCDat, and there are links for Manage, Explore, Export, and Help. A red circle highlights the 'Manage' link. Below the title, there is a blue bar with 'MY DATA SETS' and a red circle around the 'add data' link. A table displays the data sets with columns for Type, Data Set Name, Date Added, Date Range, and Status. A red callout bubble points to the 'Status' column, containing the text: 'Check the status of your data sets here. Once the status says "Available for use" the data are ready for graphing on the **Explore** page.' The table shows four entries, all with a status of 'Available for use'. Navigation links for 'Previous' and 'Next' are visible below the table. A 'Feedback' button is located in the bottom right corner.

VOCDat

Manage | Explore | Export | Help

add data

MY DATA SETS

Show 10 entries

Type	Data Set Name	Date Added	Date Range	Status
AQS	Bronx PAMS July 13	08/01/2014 16:10	01/01/2012 08:00 - 06/29/2012 08:00	Available for use
AQS	Yose1 Jan-Jun 2012	08/04/2014 10:58	01/01/2012 08:00 - 06/29/2012 08:00	Available for use
AQS	Speciation Class Test Upload DPM	08/04/2014 16:35	01/01/2012 08:00 - 06/29/2012 08:00	Available for use
AQS	Bronx PAMS July 13 v2	08/05/2014 08:53	07/01/2013 05:00 - 08/01/2013 04:00	Available for use

Showing 1 to 4 of 4 entries

Previous 1 Next

Feedback

Check the status of your data sets here. Once the status says "Available for use" the data are ready for graphing on the **Explore** page.

The **Explore** page provides three graph types: time series, scatter plot, and bar charts.

The screenshot displays the AirNow Tech VOCDat interface. At the top, the AirNow Tech logo is on the left, and navigation links for Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, and Resources are in the center. A user greeting 'Welcome, Jennifer DeWinter!' and links for My Account, Contact Us, and Log Out are on the right. Below the navigation bar, the 'VOCDat' title is on the left, and a menu with 'Manage', 'Explore', 'Export', and 'Help' is on the right. Three icons for 'Time Series', 'Scatter Plot', and 'Bar Chart' are shown. A red circle highlights the 'Explore' menu item. A red callout bubble points to the icons with the text: 'Show and hide different graphs by clicking these icons.' Another red callout bubble points to the 'Export' menu item with the text: 'Export graph images with this menu.' A zoomed-in view of the 'TIME SERIES' graph is shown below, featuring a line chart with three data series: Ethylbenzene (ppbC), Toluene (ppbC), and o-Xylene (ppbC). The x-axis shows time from 7/30/13 00:00 to 7/31/13 00:00. The y-axis is labeled 'Value' and ranges from -0.5 to 3. A red callout bubble points to the graph area with the text: 'Zoom in and out on the graphs by dragging your mouse.' The graph includes a legend, a 'Graph' button, and a 'Feedback' button.

VOCDat

Manage | Explore | Export | Help

Time Series Scatter Plot Bar Chart

Show and hide different graphs by clicking these icons.

Export graph images with this menu.

Zoom in and out on the graphs by dragging your mouse.

VOCDat

TIME SERIES

Value

7/30/13 00:00 7/30/13 03:00 7/30/13 06:00 7/30/13 09:00 7/30/13 12:00 7/30/13 15:00 7/30/13 18:00 7/30/13 21:00 7/31/13 00:00

Minimum: 0.000
Maximum: 2.770
Fixed min/max

Graph Feedback

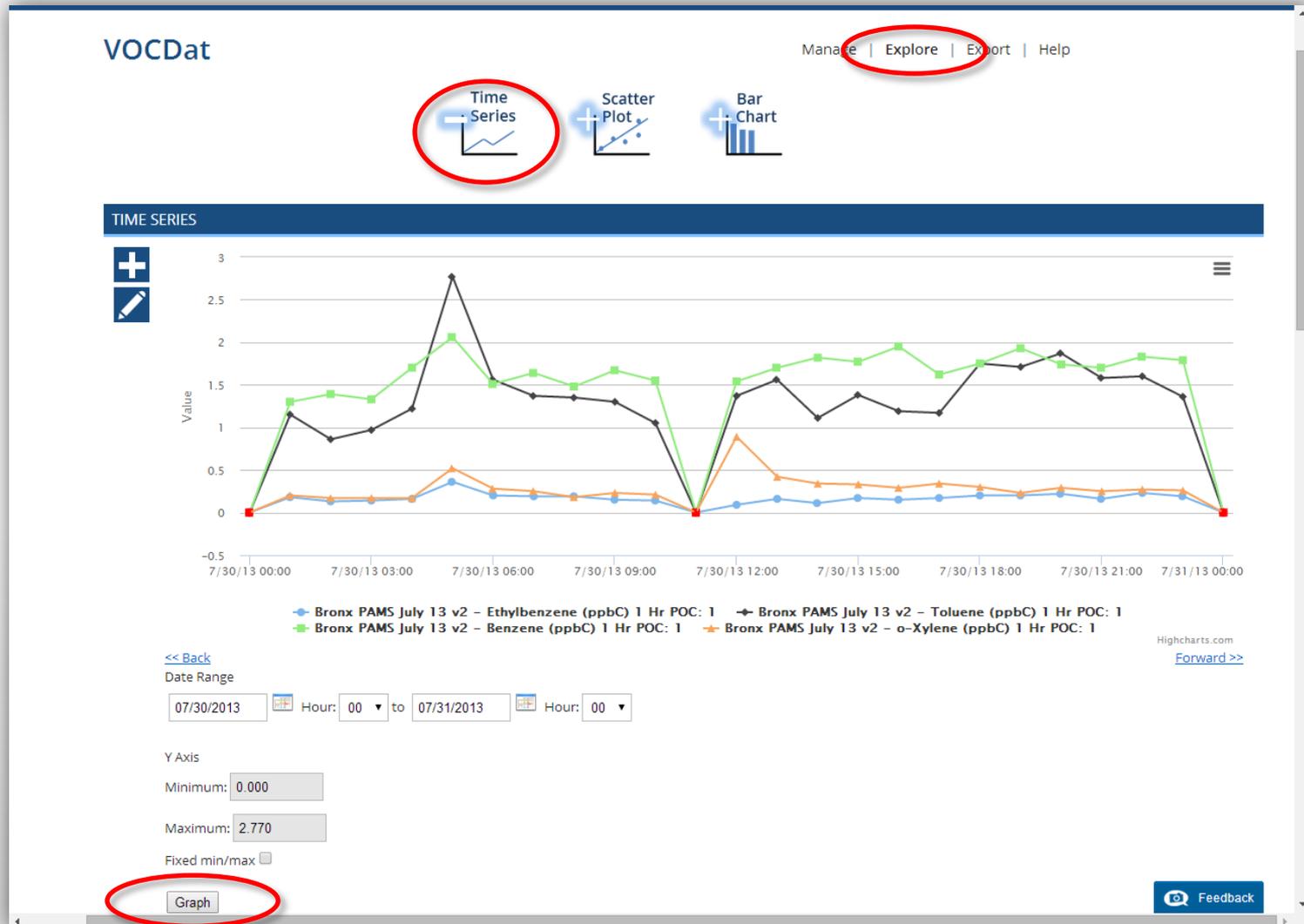
To create a time series, click the **Time Series** icon at the top of the **Explore** page. To add series to the graph, click the **add data** icon.

The screenshot displays the VOCDat interface. At the top left, the text "VOCDat" is visible. In the top right corner, there are navigation links: "Manage", "Explore", "Export", and "Help". The "Explore" link is circled in red. Below the navigation links, there are three chart type icons: "Time Series", "Scatter Plot", and "Bar Chart". The "Time Series" icon is circled in red. Below these icons is a dark blue header bar labeled "TIME SERIES". On the left side of this bar, there is a blue square icon with a white plus sign, which is circled in red. Below the header bar is a large, empty graph area with horizontal grid lines. At the bottom of the page, there is a "Date Range" section with input fields for "08/04/2014" and "08/05/2014", each followed by a calendar icon and a "Hour: 00" dropdown menu. Below the date range are "Y Axis" settings: "Minimum:" and "Maximum:" with input fields, and a "Fixed min/max" checkbox. At the bottom left, there is a "Graph" button. At the bottom right, there is a "Feedback" button with a speech bubble icon.

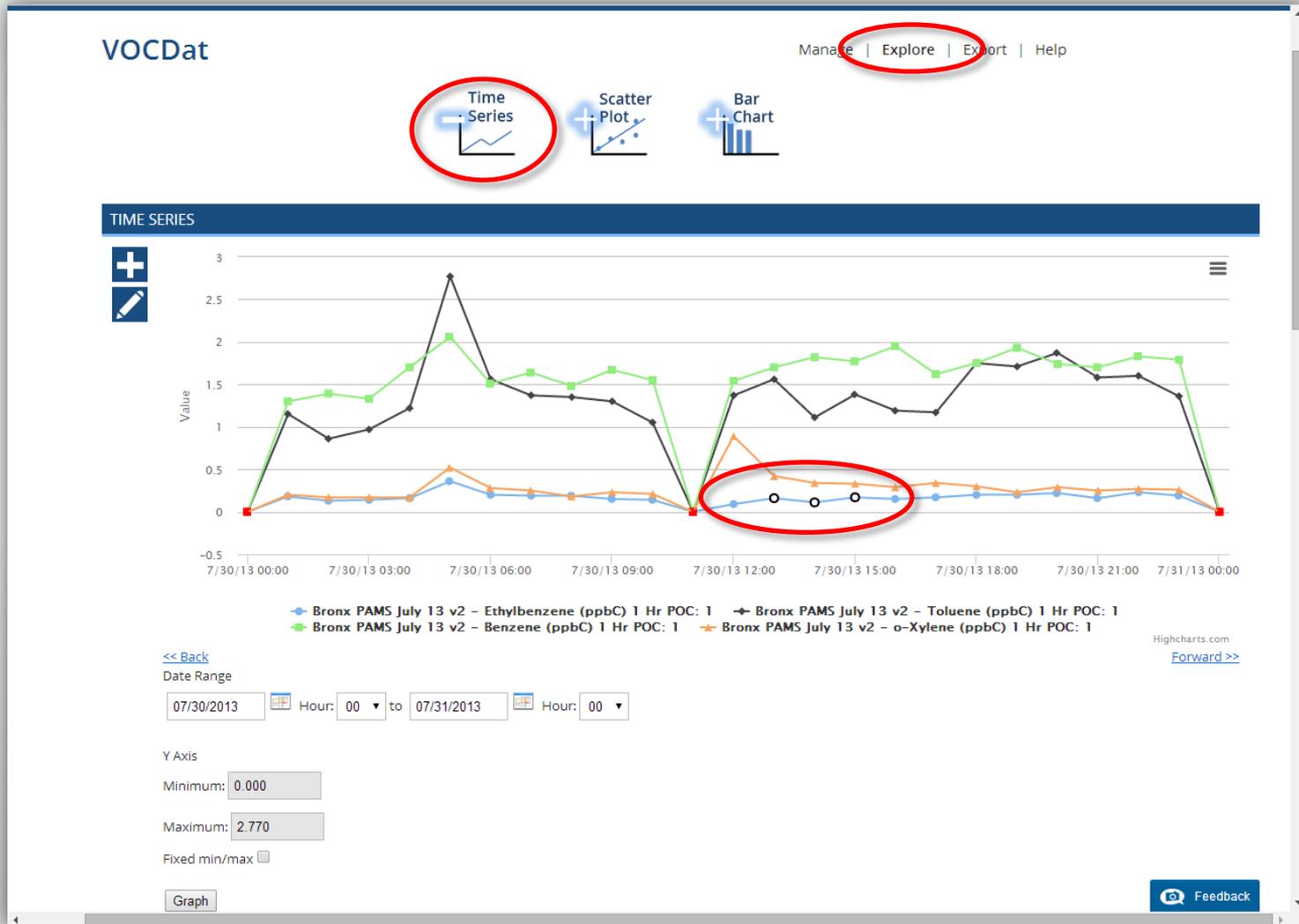
Select parameters from your available data sets. To draw the graph, click the **Minus** icon to close the menu.

The screenshot displays the VOCDat web application interface. At the top, the title "VOCDat" is on the left, and navigation links "Manage | Explore | Export | Help" are on the right. Below the navigation, three chart type icons are shown: "Time Series" (circled in red), "Scatter Plot", and "Bar Chart". A blue bar labeled "TIME SERIES" is positioned below the icons. On the left side of this bar, a minus sign icon is circled in red. The main content area is titled "YOSEMITE NATIONAL PARK - TURTLEBACK DOME" and contains a list of parameters with checkboxes. The parameters are organized into columns and include "Select All", "Select All PAMS Species", and various chemical species like Aluminum, Ammonium, Arsenic, Bromine, Calcium, Chloride, Chlorine, Chromium, Copper, EC1, EC2, EC3, EC2, Magnesium, Manganese, Nickel, Nitrite, OC, Organic_Carbon_Mass, Phosphorus, Potassium, Rubidium, Selenium, Silicon, Sodium, Soil, Strontium, Sulfate, Sulfur, Titanium, Total_Nitrate, Vanadium, Zinc, and Zirconium. At the bottom, there is a "Date Range" section with input fields for "08/04/2014" and "08/05/2014", and "Y Axis" settings for "Minimum", "Maximum", and "Fixed min/max". A "Graph" button is located at the bottom left, and a "Feedback" button is at the bottom right.

Change the date range or y-axis minimum/maximum using the settings below the graph. Then click the **Graph** button to update the graph.



To edit data quality codes, first click on a point on the graph. Use the **Shift** or **Control** keys to select multiple data points.



Click on the **edit data** icon and choose to either **Update Null Codes** or **Update Qualifier Codes** from the menu. Select a single null code or up to ten qualifier codes.

The screenshot displays the VOCDat web application interface. At the top, there are navigation links: Manage, Explore, Export, and Help. Below these are three chart type icons: Time Series (circled in red), Scatter Plot, and Bar Chart. The main content area is titled "TIME SERIES" and features a line graph with a data point highlighted by a red circle. To the left of the graph is a vertical toolbar with a plus sign and an edit data icon (a pencil), which is also circled in red. A dropdown menu is open from the edit data icon, showing two options: "Update Null Codes" and "Update Qualifier Codes", both of which are circled in red. The "Update Qualifier Codes" option is currently selected. Below the menu, there is a grid of checkboxes for various qualifier codes, such as "IA - African Dust", "IB - Asian Dust", "IC - Chem. Spills & Indust Accidents", etc. The interface also includes a date range selector set to "07/30/2013", a Y-axis scale from -0.5 to 3, and a "Graph" button at the bottom.

To apply the selected code(s), click either the **Apply Qualifier Code/Null Code** button or the **Apply Qualifier/Null Code(s) to All Species** button.

The screenshot displays the VOCDat interface. At the top, navigation links include 'Manage', 'Explore', 'Export', and 'Help'. Below these are three chart type icons: 'Time Series' (circled in red), 'Scatter Plot', and 'Bar Chart'. The main area is titled 'TIME SERIES' and features a line graph with a data point highlighted in red. To the left of the graph is a toolbar with a '+' icon and a pencil icon (circled in red). Below the graph is a list of qualifier codes, each with a checkbox. Two buttons are visible: 'Apply Qualifier Code' (circled in red) and 'Apply Qualifier Code(s) to All Species' (circled in red). A callout bubble points to the 'Apply Qualifier Code(s) to All Species' button with the text: 'Apply to all parameters in the data set with the same date/time as the selected data point(s)'. Another callout bubble points to the 'Apply Qualifier Code' button with the text: 'Apply to only the selected data point(s)'. The interface also includes a 'Date Range' field set to '07/30/2013', a 'Y Axis' section with 'Minimum: 0.000' and 'Maximum: 2.770', and a 'Graph' button at the bottom left. A 'Feedback' button is located at the bottom right.

To create a scatter plot, click the **Scatter Plot** icon at the top of the **Explore** page. To add data to the plot, click the **plus** icon.

The screenshot displays the VOCDat application interface. At the top left, the text "VOCDat" is visible. In the top right corner, there are navigation links: "Manage", "Explore", "Export", and "Help". Below these links, three chart type icons are shown: "Time Series", "Scatter Plot", and "Bar Chart". The "Scatter Plot" icon is circled in red. Below the icons is a dark blue header bar labeled "SCATTER PLOT". Underneath this header, a large white area contains a plus sign icon, which is also circled in red. Below the plus sign are several horizontal lines representing a plot area. At the bottom of the interface, there are several input fields and controls: a "Date Range" section with two date pickers (08/04/2014 and 08/05/2014) and two "Hour" dropdown menus (both set to 00); a "Y Axis" section with a dropdown menu; "Minimum:" and "Maximum:" input fields; and a "Fixed min/max" checkbox. In the bottom right corner, there is a "Feedback" button.

Select parameters from your available data sets. To draw the graph, click the **minus** icon to close the menu.

The screenshot displays the VOCDat web application interface. At the top, the title "VOCDat" is on the left, and navigation links "Manage", "Explore", "Export", and "Help" are on the right. Below the navigation, three chart type icons are shown: "Time Series", "Scatter Plot", and "Bar Chart". The "Scatter Plot" icon is circled in red. Below the icons is a dark blue header bar labeled "SCATTER PLOT". Underneath this bar, a minus sign icon is circled in red. The main content area is titled "YOSEMITE NATIONAL PARK - TURTLEBACK DOME" and contains a grid of checkboxes for various parameters. The parameters are organized into columns, with "Select All" and "Select All PAMS Species" at the top. The parameters listed include Aluminum_PM25_LC, Ammonium_Nitrate_PM25_LC, Ammonium_Sulfate_PM25_LC, Arsenic_PM25_LC, Bromine_PM25_LC, Calcium_PM25_LC, Chloride_PM25_LC, Chlorine_PM25_LC, Chromium_PM25_LC, Copper_PM25_LC, EC1_PM25_LC, EC2_PM25_LC, EC3_PM25_LC, Iron_PM25_LC, Lead_PM25_LC, Magnesium_PM25_LC, Manganese_PM25_LC, Nickel_PM25_LC, Nitrite_PM25_LC, OC_PM25_LC_TOR, Organic_Carbon_Mass_PM25_LC, Phosphorus_PM25_LC, Potassium_PM25_LC, Rubidium_PM25_LC, Selenium_PM25_LC, Silicon_PM25_LC, Sodium_PM25_LC, Soil_PM25_LC, Strontium_PM25_LC, Sulfate_PM25_LC, Sulfur_PM25_LC, Titanium_PM25_LC, Total_Nitrate_PM25_LC, Vanadium_PM25_LC, Zinc_PM25_LC, and Zirconium_PM25_LC. At the bottom of the parameter list are "Ions" and "Elements" checkboxes. Below the parameter list, there is a "Date Range" section with input fields for "08/04/2014" and "08/05/2014", and "Hour" dropdowns set to "00". There is also a "Y Axis" dropdown menu, "Minimum:" and "Maximum:" input fields, and a "Fixed min/max" checkbox. At the bottom right, there is a "Feedback" button.

Change the date range, parameters plotted on each axis, or axis minimum/maximum using the settings below the graph. Then click the **Graph** button to update the graph.

The screenshot displays a web-based interface for creating a scatter plot. At the top, a blue header reads "SCATTER PLOT". Below it is a scatter plot with "Benzene" on the vertical y-axis and "Toluene" on the horizontal x-axis. Both axes range from 0 to 10 with major grid lines every 2.5 units. The plot contains numerous blue circular data points clustered between 0 and 7.5 on the x-axis and 0 and 4 on the y-axis. A legend below the plot identifies the data as "Bronx PAMS July 13 v2 - Toluene" and "Bronx PAMS July 13 v2 - Benzene".

Below the plot are configuration settings:

- Date Range:** A date picker set to "07/16/2013" and "07/31/2013", both with "Hour: 00" dropdowns.
- Y Axis:** A dropdown menu set to "Benzene", with input fields for "Minimum: 0" and "Maximum: 10", and a checked "Fixed min/max" checkbox.
- X Axis:** A dropdown menu set to "Toluene", with input fields for "Minimum: 0" and "Maximum: 10", and a checked "Fixed min/max" checkbox.

At the bottom left, a "Graph" button is circled in red. At the bottom right, there is a "Feedback" button with a speech bubble icon.

A red speech bubble callout points to the configuration area with the text: "Set the date range of data to include in the graph and change the settings for the x-axis and y-axis."

To create a bar chart, click the **Bar Chart** icon at the top of the **Explore** page. To add data to the chart, click the **plus** icon.

The screenshot displays the VOCDat interface. At the top left, the text "VOCDat" is visible. On the right side, there are navigation links: "Manage", "Explore", "Export", and "Help". Below these links, three chart type icons are shown: "Time Series", "Scatter Plot", and "Bar Chart". The "Bar Chart" icon is circled in red. Below the chart type selection, a blue header bar contains the text "BAR CHART". To the left of the main chart area, a plus sign icon is circled in red. The main chart area is currently empty, showing only horizontal grid lines. At the bottom of the interface, there is a "Date Range" section with a date range of "08/04/2014" to "08/05/2014" and "Hour" dropdowns set to "00". Below the date range, there are input fields for "Y Axis" with "Minimum:" and "Maximum:" labels, and a "Fixed min/max" checkbox. In the bottom right corner, there is a "Feedback" button.

Select parameters from your available data sets. To draw the graph, click the **minus** icon to close the menu.

The screenshot shows the VOCDat web application interface. At the top, the title "VOCDat" is on the left, and navigation links "Manage | Explore | Export | Help" are on the right. Below the title, three chart type icons are displayed: "Time Series", "Scatter Plot", and "Bar Chart". The "Bar Chart" icon is circled in red. Below the icons, a "BAR CHART" header is visible. Underneath, a list of data sources is shown on the left, with "Bronx PAMS July 13 v2" selected. To the right, a large panel titled "YOSEMITE NATIONAL PARK - TURTLEBACK DOME" contains a grid of checkboxes for various chemical species. A minus sign icon in a blue square is circled in red, indicating the action to close the menu. Below the species list, there is a "Date Range" section with input fields for dates and times, and a "Y Axis" section with input fields for "Minimum" and "Maximum", and a "Fixed min/max" checkbox. A "Feedback" button is located in the bottom right corner.

VOCDat Manage | Explore | Export | Help

Time Series Scatter Plot Bar Chart

BAR CHART

Minus icon

Bronx PAMS July 13

YOSEMITE NATIONAL PARK - TURTLEBACK DOME

- Select All
- Select All PAMS Species
- Aluminum_PM25_LC
- Ammonium_Nitrate_PM25_LC
- Ammonium_Sulfate_PM25_LC
- Arsenic_PM25_LC
- Bromine_PM25_LC
- Calcium_PM25_LC
- Chloride_PM25_LC
- Chlorine_PM25_LC
- Chromium_PM25_LC
- Copper_PM25_LC
- EC1_PM25_LC
- EC2_PM25_LC
- EC3_PM25_LC
- Iron_PM25_LC
- Lead_PM25_LC
- Magnesium_PM25_LC
- Manganese_PM25_LC
- Nickel_PM25_LC
- Nitrite_PM25_LC
- OC_PM25_LC_TOR
- Organic_Carbon_Mass_PM25_LC
- Phosphorus_PM25_LC
- Potassium_PM25_LC
- Rubidium_PM25_LC
- Selenium_PM25_LC
- Silicon_PM25_LC
- Sodium_PM25_LC
- Soil_PM25_LC
- Strontium_PM25_LC
- Sulfate_PM25_LC
- Sulfur_PM25_LC
- Titanium_PM25_LC
- Total_Nitrate_PM25_LC
- Vanadium_PM25_LC
- Zinc_PM25_LC
- Zirconium_PM25_LC
- Ions
- Elements

-1 hour Date Range +1 hour

08/04/2014 Hour: 00 to 08/05/2014 Hour: 00

Y Axis

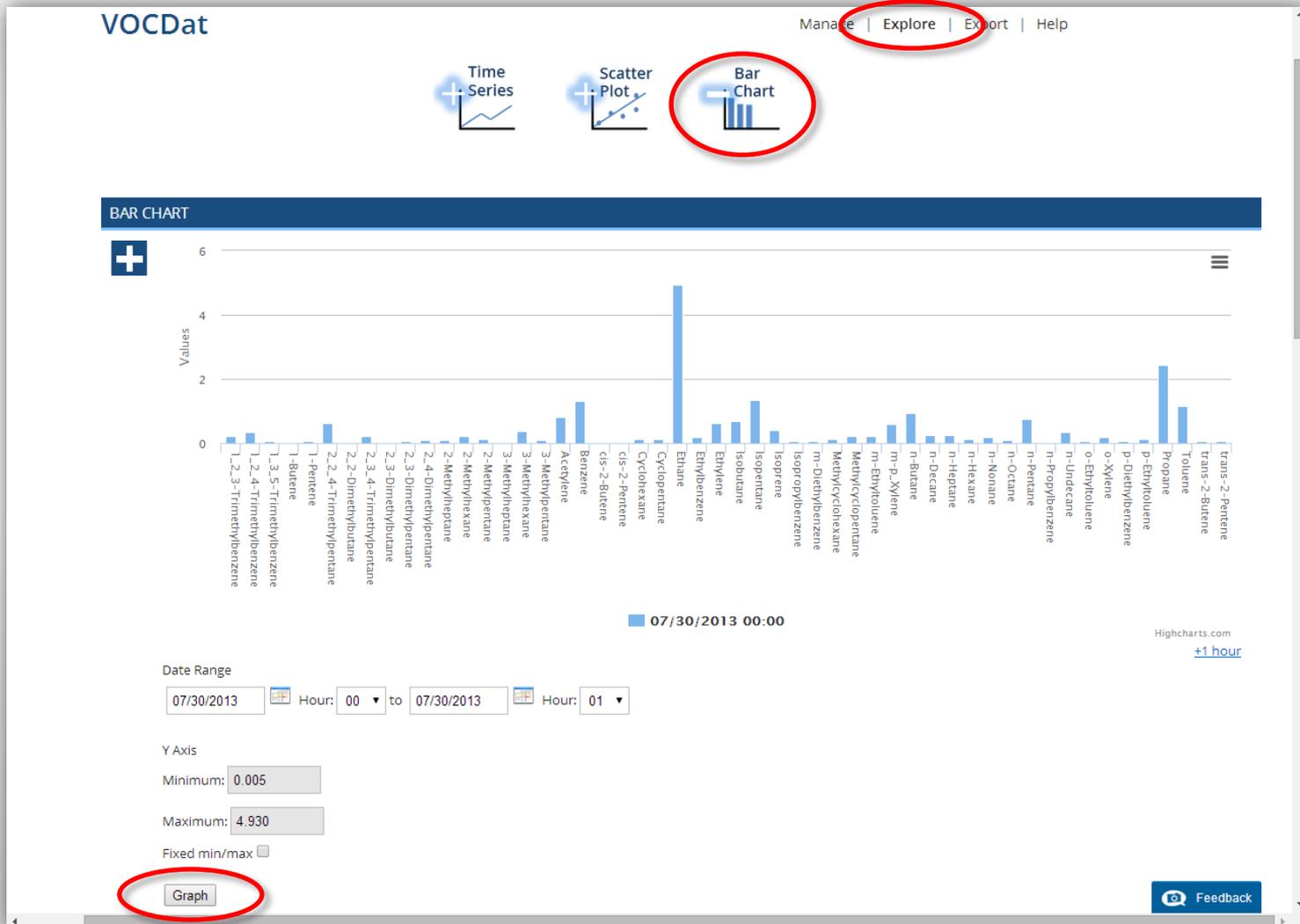
Minimum: [input field]

Maximum: [input field]

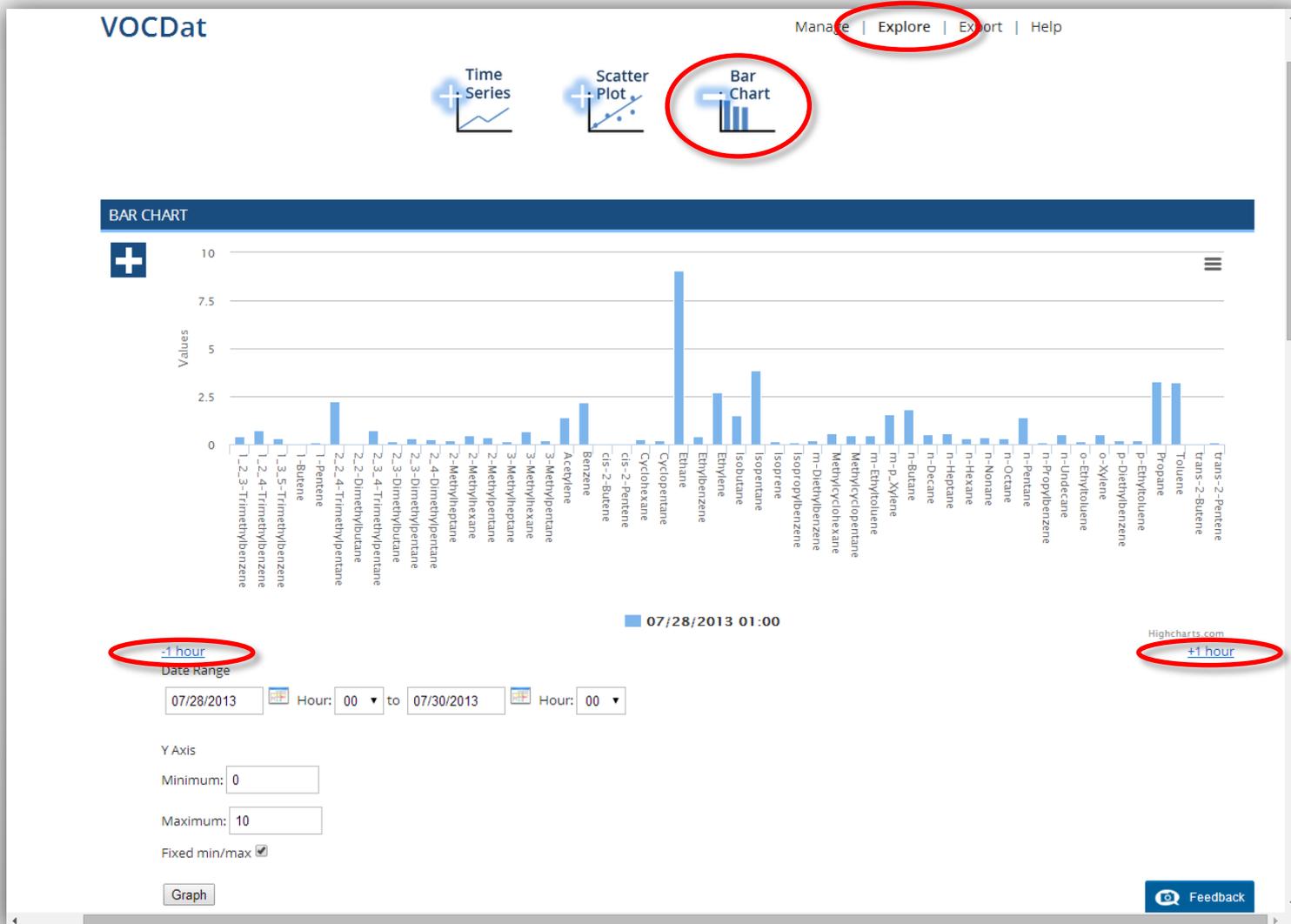
Fixed min/max [checkbox]

Feedback

Change the date range or y-axis minimum/maximum using the settings below the graph. Then click the **Graph** button to update the graph.



To toggle through time, click the **+1 hour** or **-1 hour** links.



The **Export** page provides the ability to set up custom screening checks, export data to a file, and export summary statistics to a file.

Welcome, Jennifer DeWinter! | [My Account](#) | [Contact Us](#) | [Log Out](#)

Agencies Sites Navigator Data Forecasts Polling Notifier Tools Resources

VOCDat Manage | Explore | **Export** | Help

SCREENING CHECKS

Screening Type	Parameter	Value
<input checked="" type="checkbox"/> Species Threshold		=

[add new check +](#)

2014 Hour: 00 08/05/2014 Hour: 00

Export File Name

DATA EXPORT

Export Data Export Summary Statistics

Options

- Include missing data and apply null code AA
- Perform MDL Check or Data Substitutions
 - Add qualifier code MD for values less than MDL
 - Substitute MDL/2 for Value and add MS Qualifier
- Apply qualifier code ND(no value detected) to all records if the concentration is 0

File Format: AQS

[Feedback](#)

Set up custom screening checks for data quality control.

Export data or summary statistics to a file.

To help assess data quality, set up screening check(s) on the **Export** page. Name your file and then click **Export** to download a file with any data records that failed the screening check(s). Click the **add new check** icon to set up multiple checks.

The screenshot displays the AirNow Tech web interface. At the top, the navigation bar includes links for Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, Tools, and Resources. The user is logged in as Jennifer DeWinter. The main content area is titled 'VOCDat' and features a 'SCREENING CHECKS' section. A red callout bubble points to the 'Screening Type' dropdown menu, which is currently set to 'Species Threshold'. Below this, there are input fields for 'Parameter' and 'Value', along with an equals sign dropdown. The 'Date Range' section shows dates from 08/04/2014 to 08/05/2014, both at 00:00. The 'Export File Name' field is empty, and the 'Export' button is highlighted with a red circle. A red circle also highlights the 'Export' link in the top navigation bar. A red circle highlights the 'add new check +' button on the right side of the page.

Select from five types of screening checks.

add new check +

Export

To export data from VOCDat, choose either the **Export Data** or **Export Summary Statistics** radio button. Click **Select data for export** to specify the data to export. Optionally for data file export, choose to include missing data or perform data method detection limit substitutions.

The screenshot displays the 'DATA EXPORT' interface. At the top, there are two radio buttons: 'Export Data' (selected) and 'Export Summary Statistics'. Below these is a button labeled '+ Select data for export'. To the right, an 'Options' section contains several checkboxes and radio buttons: 'Include missing data and apply null code' (set to 'AA'), 'Perform MDL Check or Data Substitutions' (with sub-options for 'Add qualifier code MD' and 'Substitute MDL/2 for Value and add MS Qualifier'), and 'Apply qualifier code ND(no value detected) to all records if the concentration is 0'. Below the options is a 'File Format' dropdown set to 'AQS'. At the bottom, there is a 'Date Range' section with date and hour pickers (08/04/2014 00:00 to 08/05/2014 00:00), an 'Export File Name' input field, and an 'Export' button.

More information is available about the following:

- EPA AQS
<http://www.epa.gov/ttn/airs/airsaqs/>
- EPA Datamart
<http://www.epa.gov/ttn/airs/aqsdatamart/>
- PAMS Data Validation and Analysis
<http://www.epa.gov/ttnamti1/pamsworkbook.html>
- VOCDat User's Guide - coming soon!

