EPA's Data Analysis and Reporting Tool (DART)

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on behalf of the
EPA OAQPS PAMS Program

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Sonoma Technology, Inc.

Acknowledgments

Kevin Cavender, EPA
Jennifer DeWinter, STI
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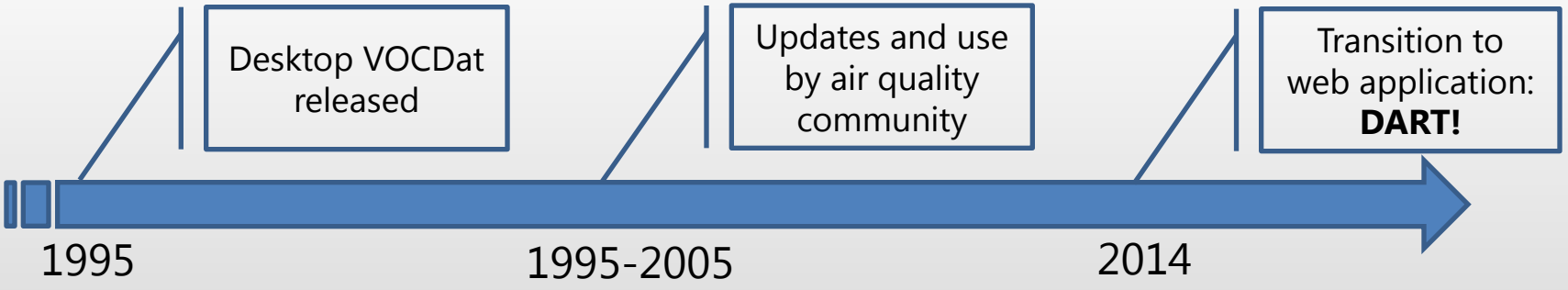
With excellent feedback and ideas from NACAA Steering Committee

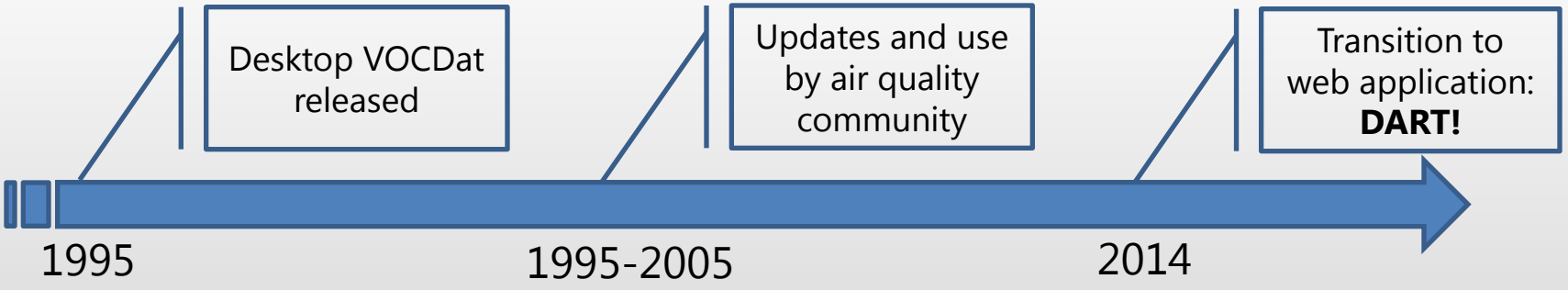
DART History

- Formerly VOCDat, a desktop software program
- Used by PAMS community to validate VOC data and prepare data for AQS submission
- Used to analyze carbonyls, air toxics, and speciated $PM_{2.5}$



What is DART Now?

- Web-based application for acquiring, analyzing and screening data
- Useful for all types of air quality data (criteria, VOCs, toxics, etc.)
- Available in AirNow-Tech



Meet DART

- Prepare data for AQS
- Upload data files
- Request data from AQS
- Convert units
- Aggregate data
- Create time series and edit data
- Create scatter plots
- Create bar plots
- Screen data
- Export data and summary statistics

DART Version 2.0 – New Features

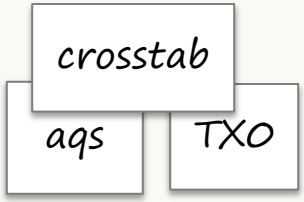
- **All-New Automated PAMS data screening**
  - "One-click" auto-screening provides interactive tables and plots to evaluate PAMS data
  - Screening checks based on recommended procedures in PAMS Data Analysis Workbook
- **Improved Data Imports**
  - Improved status information for data uploads and AQS requests
  - Unit conversions and customization of units on graphics

General Workflow in DART

1

Add data to DART

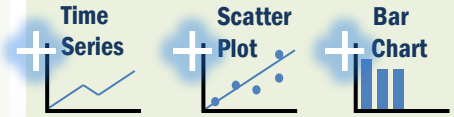
Manage



2

Explore data with graphs

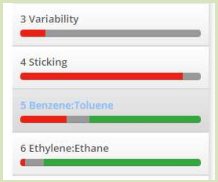
Explore



3

Perform validation

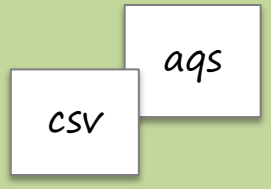
Validate



4

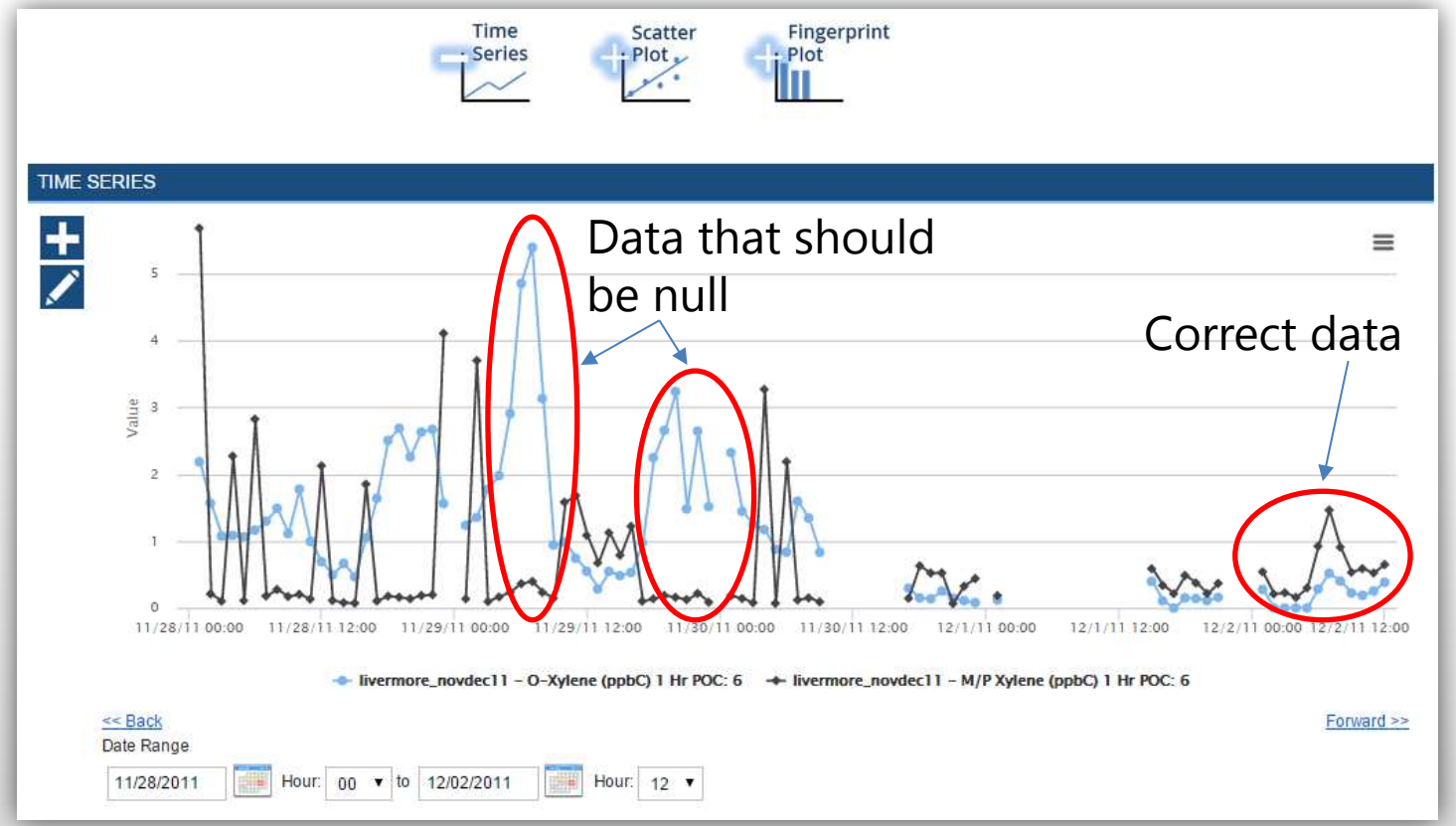
Export data and statistics

Export



Time-Series Graphs

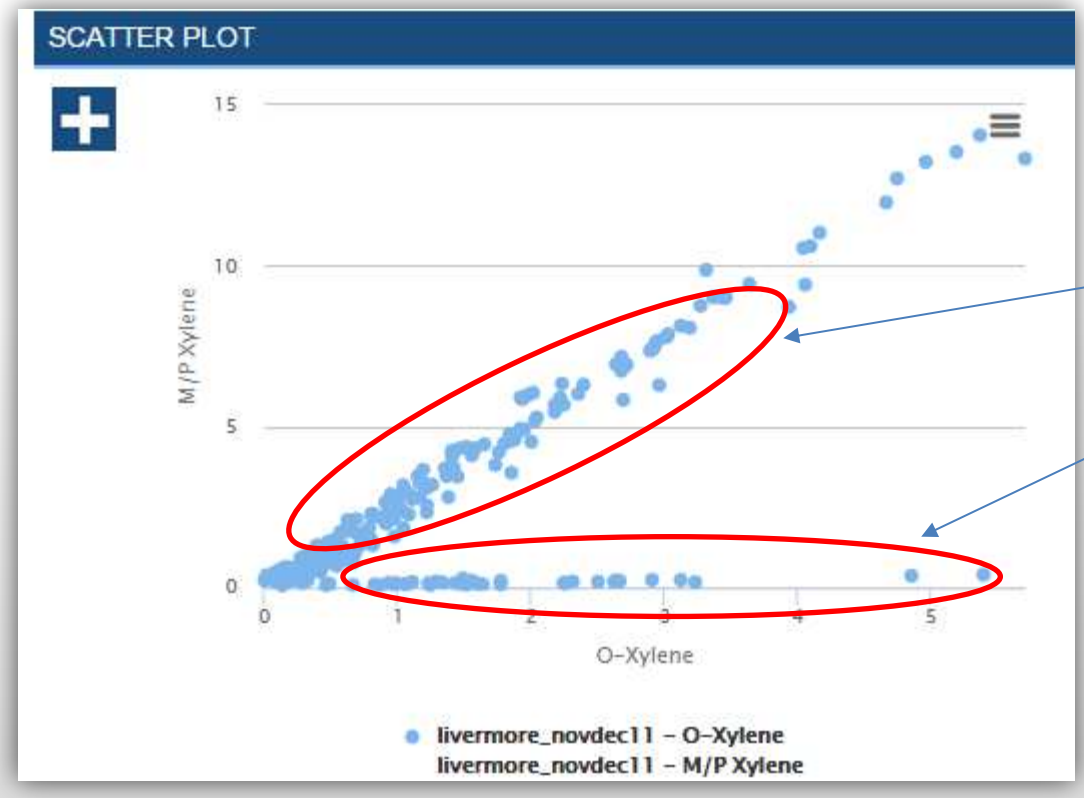
Time-series graphs are used to identify outliers, unusual data, trends, effects of meteorology in air quality, and changes in relationships among species



m/p-xylene is always > o-xylene in emissions and ambient air

Scatter Plots

Scatter plots are used to identify outliers outside of usual patterns in the data; some species have typical relationships based on meteorology and emissions



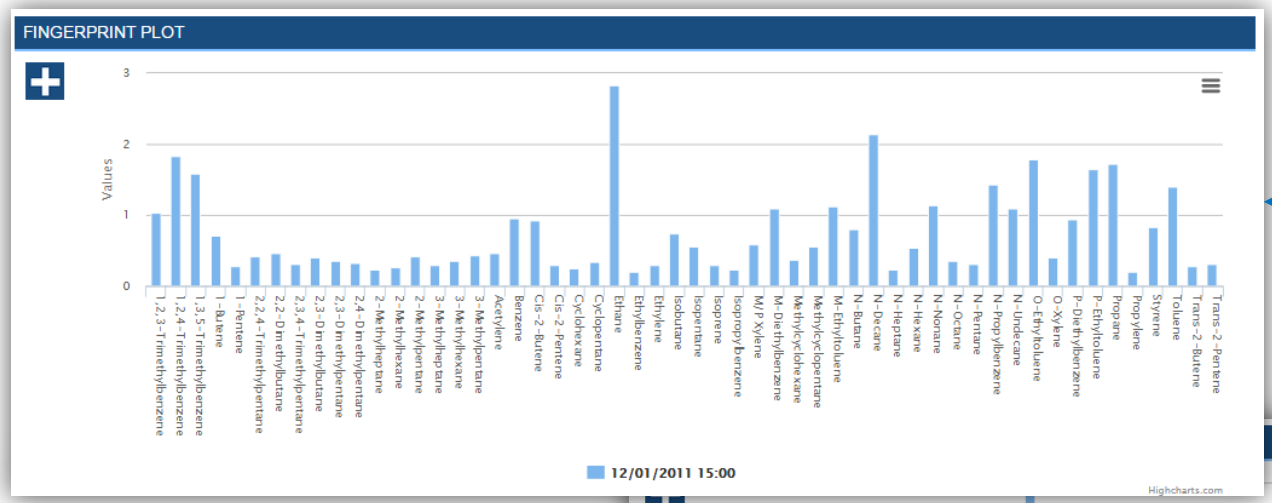
Correct data

Data that should be null

m/p-xylene is always > o-xylene in emissions and ambient air

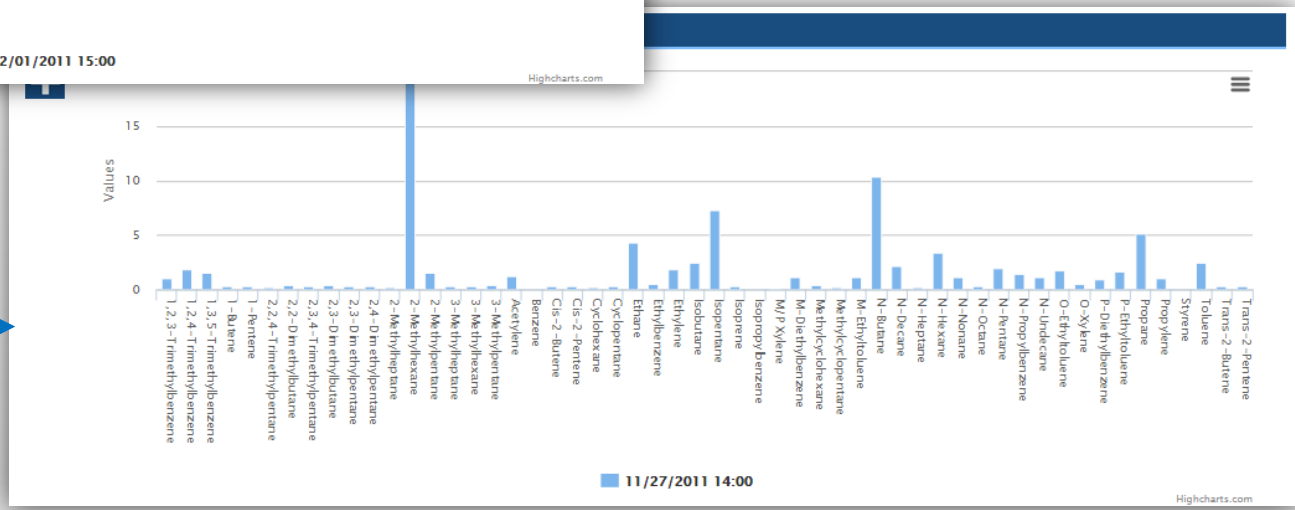
Fingerprint Plots

Fingerprint plots are used to scroll through data sample by sample to visually identify sudden changes in data



Good sample, typical of ambient VOCs

Unusual sample and likely bad data – examine this sample further using time series and scatter plots



Screening Checks (1)

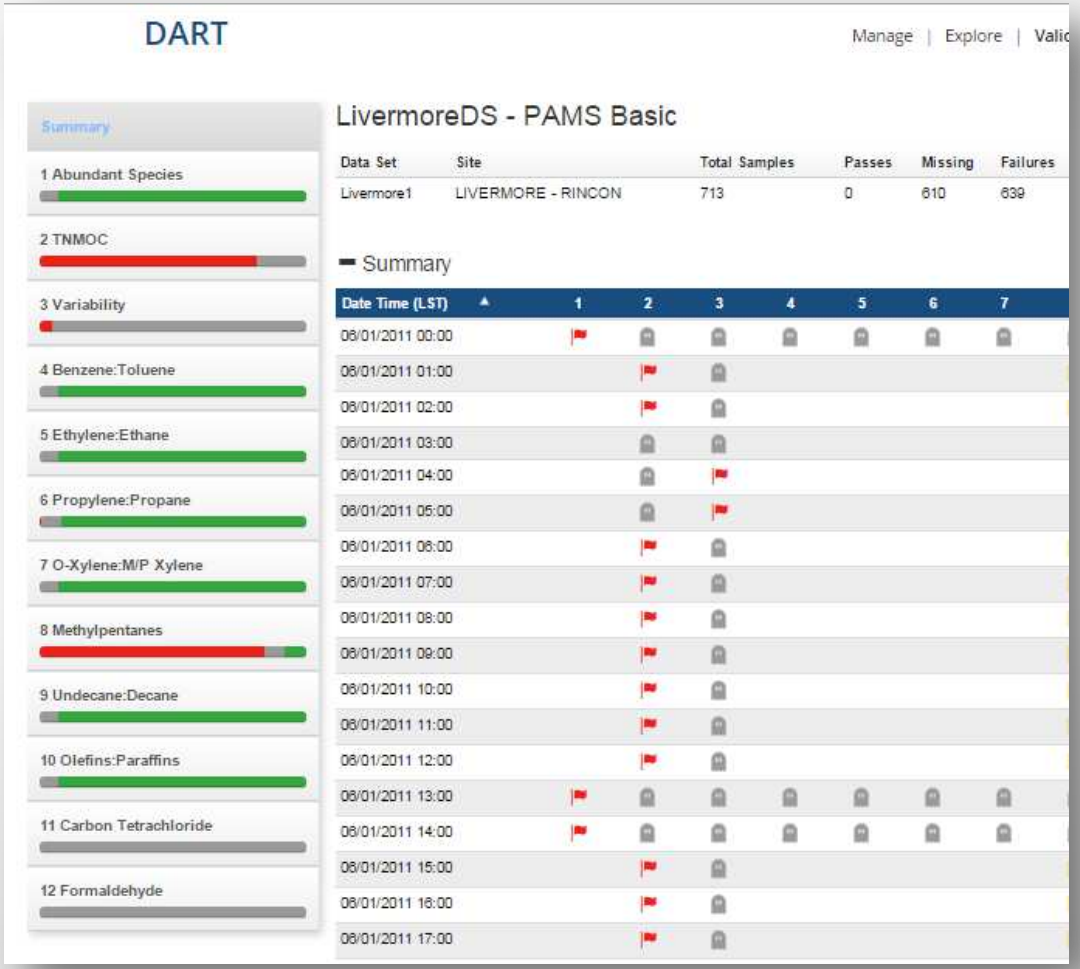
- Use screening checks to identify and export sample records that don't meet your conceptual model of ambient air quality or your sites, or that are physically unrealistic
- For example, look for samples with
  - High unidentified fraction (possible error in GC column, or data reporting error)
  - O-xylene>m/p-xylene (physically unreasonable, likely error in species identification)
  - Carbon tetrachloride below global background levels (physically unreasonable, likely error in sampling)
  - Sulfate>3*sulfur (physically unreasonable, likely error on Nylon or Teflon filter)

Screening Checks (2)

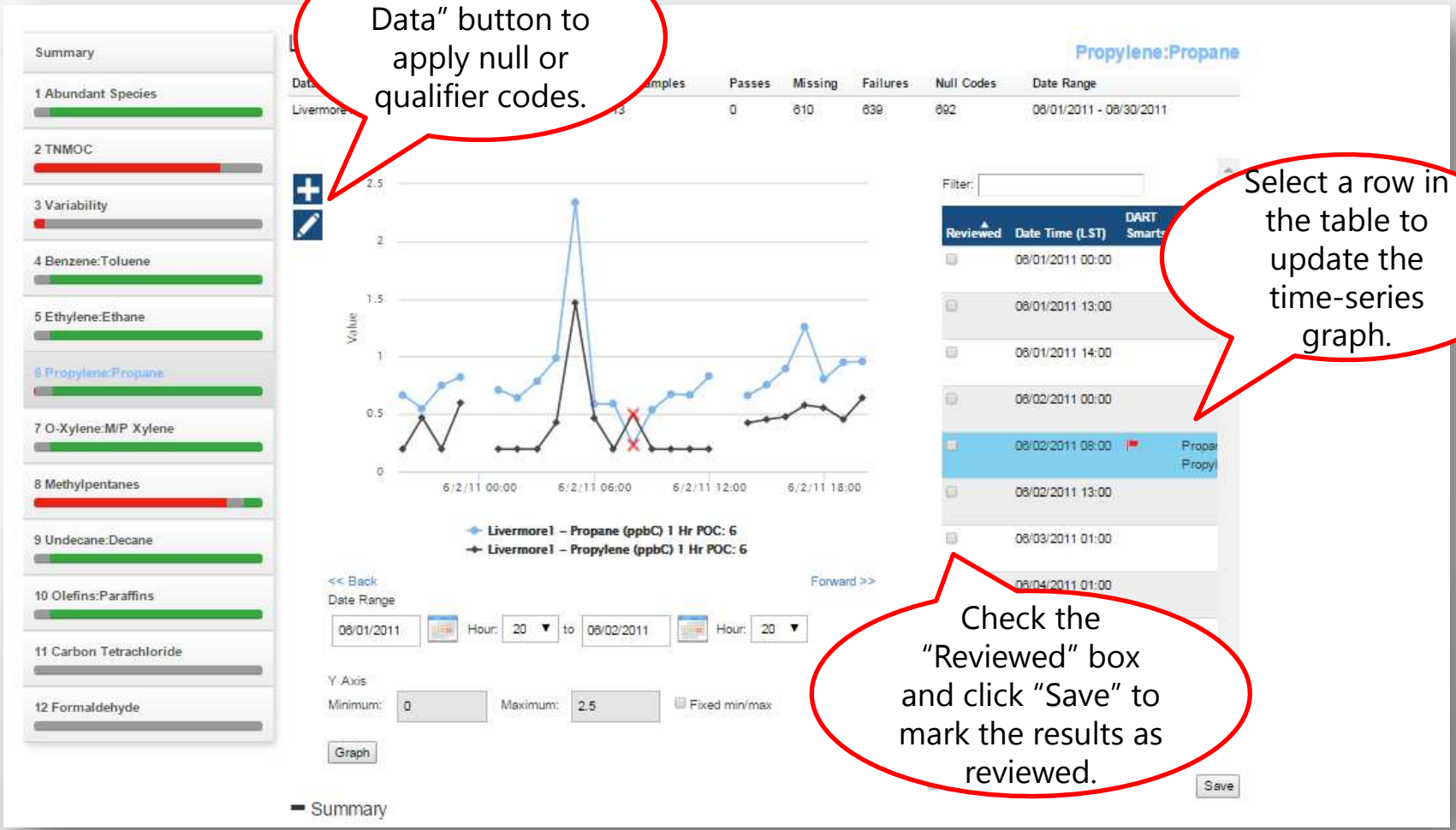
- **Species Threshold –** identify data values that exceed threshold criteria
- **Species Variability –** identify data within a specified variability range
- **Species Comparison –** compare data values between parameters according to defined criteria
- **Species Fraction –** identify data values that are within a specified fraction of another data parameter value
- **Multi-Condition –** create data screening queries that meet more than one condition

Automated Screening Checks (1)

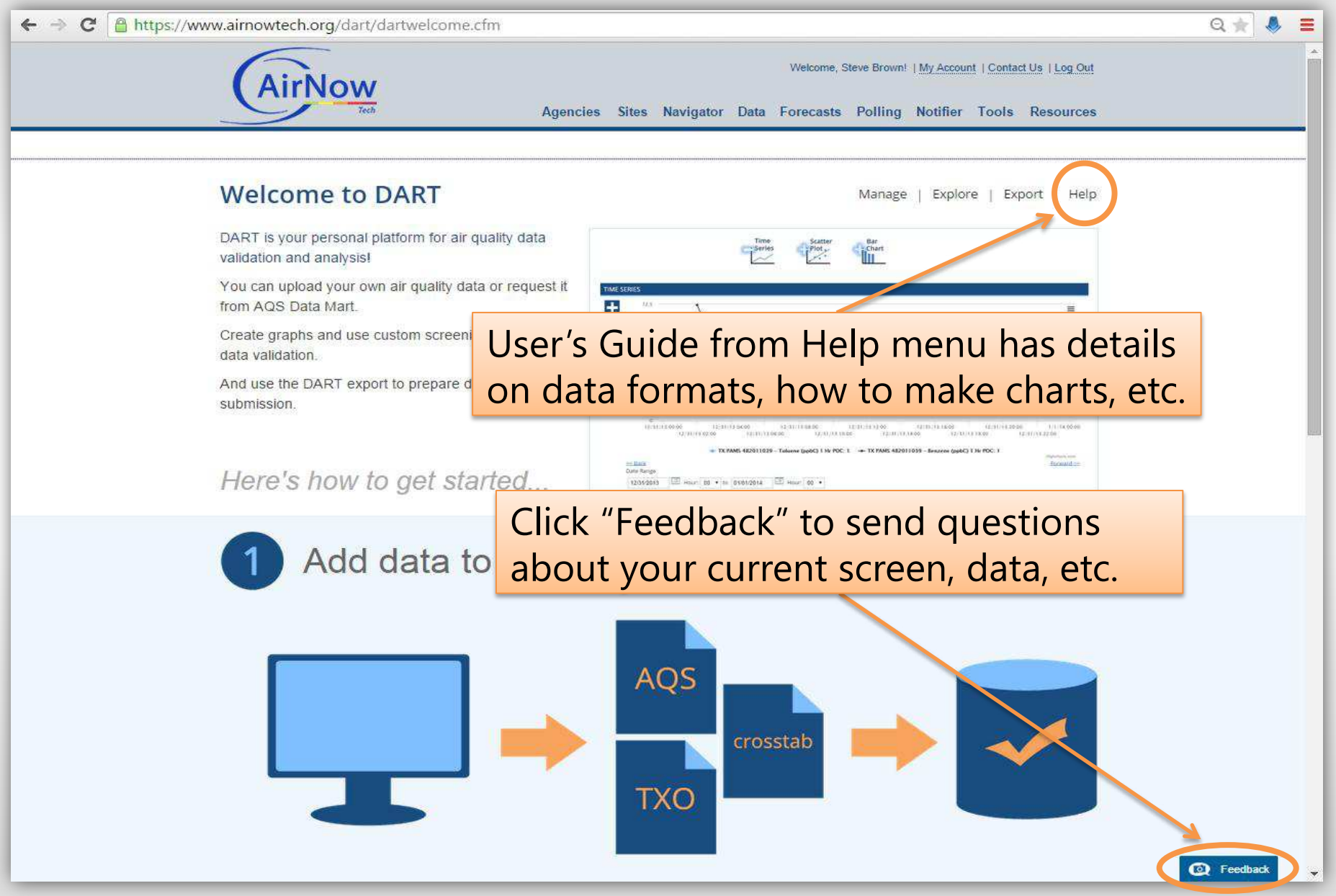
- Run screening checks to identify problematic VOC data
- Review results in DART using interactive, linked tables and time-series graphs



Automated Screening Checks (2)



How to Get Help



Upcoming Features

- **Customized automated data screening**
  - Setup your own “One-click” auto-screening checks
- **Secondary y-axis for time series**
- **Delete data sets**

Future Feature Ideas

- **Interactive map for Data Mart AQS requests**
- **Suite of automated screening checks for air toxics**
- **Compare site to national statistics**
- **New analyses and plot types**
  - Plot concentrations and MDL values
  - Plot concentrations and annual averages
- **Support for more import file formats**

Summary

- DART is ready to use! Please let us know if you have questions or ideas for new features
- More new features to be deployed in November 2015
- After deployment, several webinars will be given
- Next phase of development to begin in 2016

Contact Us

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