

Drawing Board to Real World using ODS Graphical and Tabular Outputs on One Page

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Output Delivery System (ODS) is designed to overcome the limitations of traditional SAS® output in listing format. ODS is flexible and can be used to create custom page layouts. By incorporating new tagsets, users can create a combination of charts, graphs, maps, and tables on a single page using templates provided by SAS. This presentation gives an example of creating county profiles of health, demographics, and ambient air pollution profiles for New York State using maps, vertical and horizontal bar charts, pie charts, plots, and tables on a single HTML page. By using HTML panels, DOH staff can easily obtain an overview of demographic, health, and air pollution data trends for a selected area. This will aid in targeting areas for further analysis.

This paper presents a step-by-step process of creating multiple outputs on a single page utilizing various features of ODS. With the ActiveX feature, users can change the graph type, background and colors, add or delete title, and zoom on a section of graph/chart without modifying SAS codes. This presentation is intended for SAS users with basic SAS knowledge who want to enhance their SAS output using ODS.

Introduction:

Presenting a profile that contains information on population by age and gender, data for four ambient air pollutants, and vital statistics (e.g. number of live births by race and gender, hospitalization for a specific disease and mortality) per NYS county is a difficult task given the wealth of information available for each of the sixty-two counties. SAS provides numerous formats for data presentation including frequency tables, reports, charts, and plots, and will create separate reports and charts for each county. Presenting this information in a limited desktop space, however, is a tremendous challenge.

Using ODS and HTML with ActiveX and Java functionality of SAS version 9.1, it has been easier to present the data in an attractive yet meaningful way for various user-levels. Once an HTML page with SAS outputs is created, users can employ the interactive features of JAVA and ActiveX output to browse thorough each county profile with a click of a mouse. This presentation illustrates how to use HTML panels to create multiple outputs (including graphical and tabular output) on one page. As you will see, once the codes are executed, the output can simply be cut and pasted for use in technical

reports, presentations, or data display on intranet/internet without comprising data confidentiality.

MATERIALS AND METHODS:

Data:

Let’s take a look at the data for this presentation (referenced at the end of this paper) in Figure 1. Each data set has one common variable—County Name—for creating profiles of different county-related information.

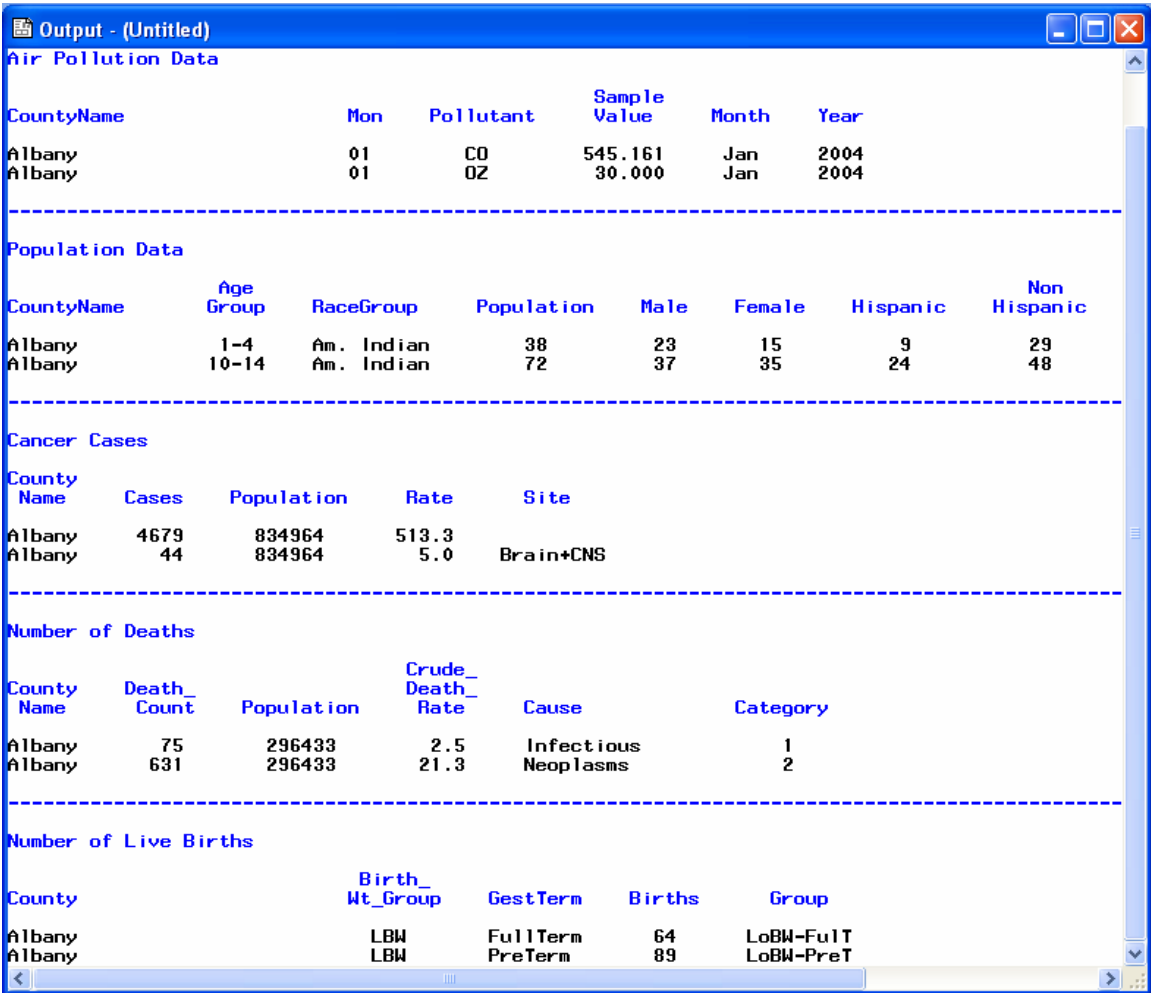


Figure 1: Raw data for creating bar charts

Drawing Board:

First, we need to draw the panels and define cells by row and column number. Figure 2 is a diagrammatic representation of panels you can create using the program from this presentation. Once you have a general concept of the HTML panels, you can use them for a number of presentation styles.

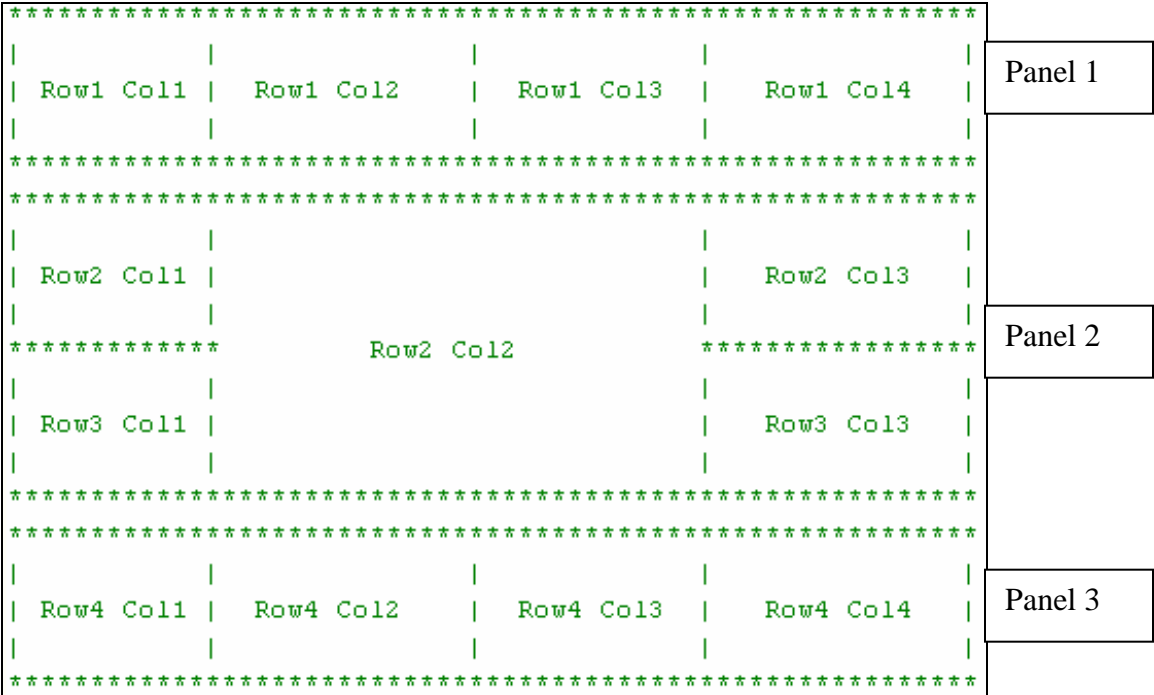


Figure 2: Diagrammatic representation of HTML panels

Figure 2 includes the row and column ID for each panel cell, from top left to bottom right. The four cells in the center have been merged to allow a larger graphical output. The number of rows and columns can be changed according to your needs.

Creating Panel for Graphical Output:

This is where the fun starts in using the ODS features of SAS version 9.1. To create panels as shown in Figure 2, we need to use three ODS tagsets. As with most of the ODS features, each event will have a start and finish statement. To create a panel, we need to start a panel, a row and a column as follows:

```
GOPTIONS reset=all dev=ActiveX;
GOPTIONS xpixels=240 ypixels=240;
ODS tagsets.HTMLpanel PATH=" C:\ NESUG\Panels\Output "
(url=none) FILE="CountyProfile.HTML" STYLE=styles.bigNorm;
ODS TAGSETS.HTMLpanel event = panel(start);
/* After panel, start *first row */
ODS tagsets.HTMLpanel event=row_panel(start);
/* Cell 1 Column 1*/
/* Start a column panel*/
ODS tagsets.HTMLpanel event=column_panel(start);
```

Now we can add any SAS output codes and the output will be placed in this cell. For example, if I use the following codes to create a vertical bar chart of

monthly maximum ozone values for a selected county in 2004, I can use PROC GCHART as follows:

```
PROC GCHART DATA=Demo.EPaDataStat;
VBAR month / Discrete SumVar=SampleValue Raxis=Axis1
Maxis=Axis2;
Where CountyName="&MYCnty" AND Year="2004" AND
Pollutant="OZ";
RUN;
QUIT;
```

Output from the above codes will be placed in the top left cell of the panel. To create the output for next cell, in this row (row 1), we must close this column as follows:

```
ODS tagsets.HTMLpanel event=column_panel(finish);
```

We will need to process each cell according to the diagram on the drawing board. Once all cells in first panel are complete, we can close that panel and proceed to the next panel. To close the panel we follow the same steps as we did for starting the panel, but in reverse order, as follows:

```
/* Close the Row #1 */
ODS tagsets.HTMLpanel event=row_panel(finish);
/* Close 4th and last column of Row #1 */
ODS tagsets.HTMLpanel event=column_panel(finish);
/* Close first panel */
ODS TAGSETS.HTMLpanel event = panel(finish);
```

Figure 3 shows the output for the first panel in our drawing board:

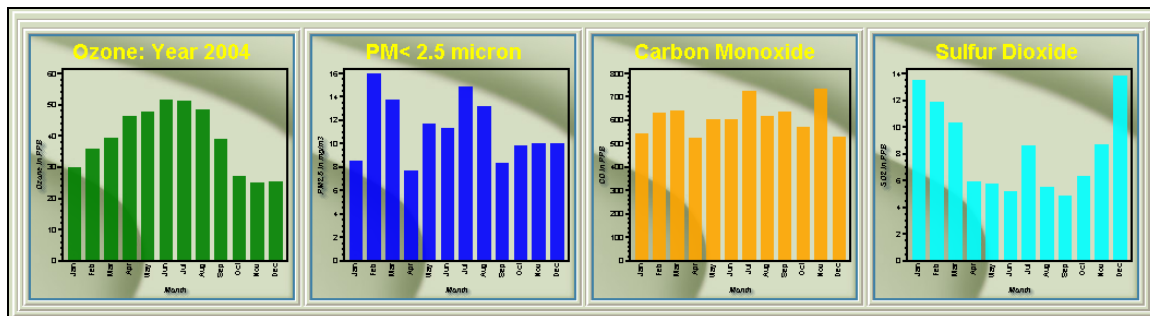


Figure 3: First HTML panel showing four graphical outputs

Similarly, we can process the remaining panels to show related information. I used PROC GMAP to fill the larger, merged cell in the center of the final output shown in Figure 4. You will need to create two rows in the first column of the second panel before you can process the center cell. Each cell

has a predefined pixel size set under GOPTIONS. To create the larger cell, change the number of pixels according to the desired cell size. In the first panel I used `xpixels=240 ypixels=240`. In the second panel, the first column remains unchanged, whereas for the second column, I changed `x` and `y` values to 493 and 440 pixels respectively to accommodate the New York State map.

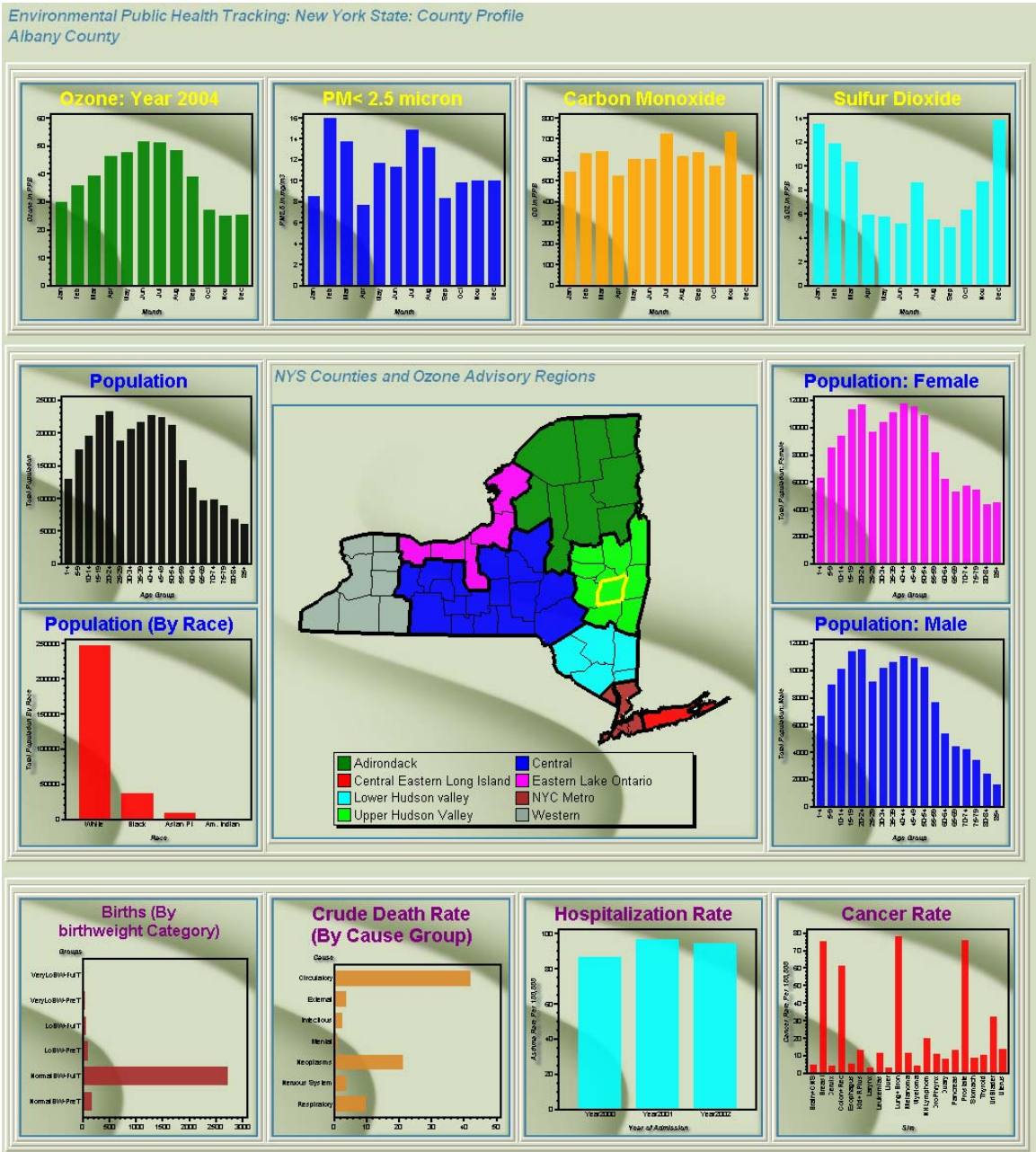


Figure 4: Three HTML panels, with multiple outputs on one HTML page

Each graphical output above is created using device=ActiveX under GOPTIONS. More information on this feature can be seen in my previous NESUG publication (1). In short, ActiveX provides a wide array of choices for modification of the graphical output. Figure 5 shows various available features associated with ActiveX graphs:

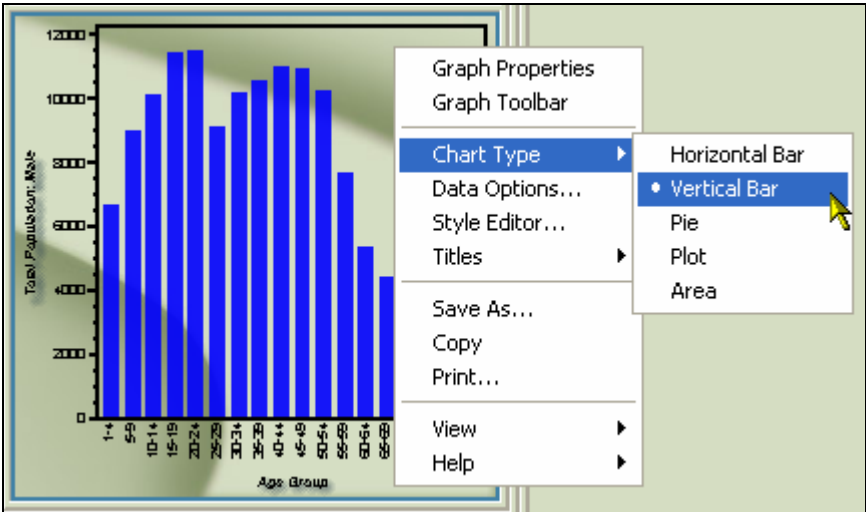


Figure 5: Options to modify SAS ActiveX output

Any of these options can be used without modifying the SAS codes. Figure 6 is an example of how to show these options in ActiveX:

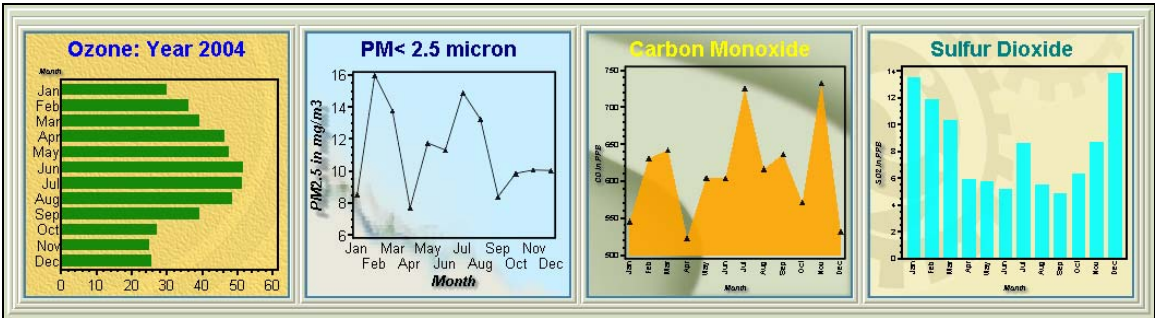


Figure 6: Modified bar charts using ActiveX features, without changing SAS codes

Creating Panels for Tabular Output:

Similar to the graphical panels, we can create the tabular panels using the start and finish statements for each cell of the panel. To help the readers follow the information presented and to make the complex county profiles more comprehensible, I used the same panel layout for the tabular output as I did for the graphical output. You can be creative in developing different layout for tabular and graphical output, according to your own needs. Following screen image shows the first four cells in the tabular output. Each cell is a representation of graphical output derived in the first step.

Total Population by Age group			Total Population by Race			Total Population: Male			Total Population: Female		
County	Age Group	Population	County	Race	Population	County	Age Group	Male	County	Age Group	Female
Albany	1-4 years	12969	Albany	American Indian or Alaska Native	835	Albany	1-4 years	6691	Albany	1-4 years	6278
Albany	10-14 years	19523	Albany	Asian or Pacific Islander	10099	Albany	10-14 years	10118	Albany	10-14 years	9405
Albany	15-19 years	22764	Albany	Black or African American	37084	Albany	15-19 years	11425	Albany	15-19 years	11339
Albany	20-24 years	23271	Albany	White	248155	Albany	20-24 years	11533	Albany	20-24 years	11738
Albany	25-29 years	18847				Albany	25-29 years	9154	Albany	25-29 years	9693

Data Source: <http://wonder.cdc.gov/>

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Figure 7: Tabular output using PROC PRINT in HTML Panel

As indicated in Figure 7, the output that normally takes a long list of graphical and tabular output to flip and compare is greatly simplified when HTML panels are used. By allowing placement of multiple outputs in graphical and/or tabular format, HTML panels enable users to easily find important information and to target resources accordingly. Users can compare county profiles by using associated maps, and can open a desired profile by simply clicking on the county on the map.

All of these outputs are seamlessly generated on one HTML page, referred to at the beginning of the SAS codes, and any graphical output included in the cells can be saved as an image file in *.jpg or *.bmp format.

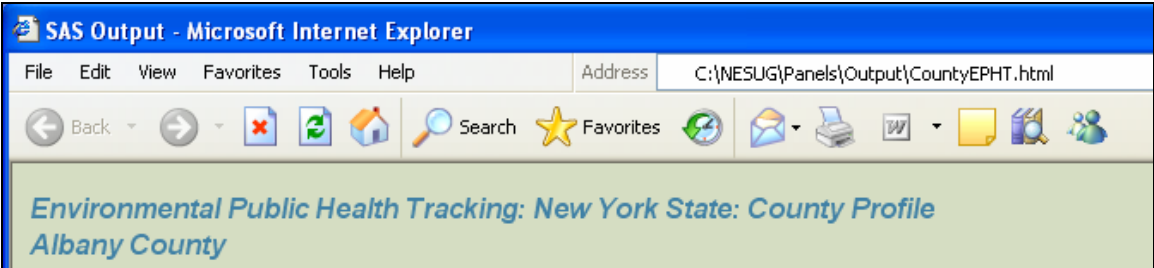


Figure 8: Location of HTML page created by SAS

CONCLUSION:

This presentation has provided basic concepts that will allow a beginner-level SAS programmer to get started in exploring the HTML panel and Output Delivery System. Using HTML panels to create internet ready output is a useful tool in that it lets the user decide upon various style elements for charts and reports. These basic techniques provide a foundation upon which more complex reports and graphs can be developed.

REFERENCES:

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4. Air pollution data:
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