



# Books by Users

Reviewed by  
Ken Mah  
Statistics Canada

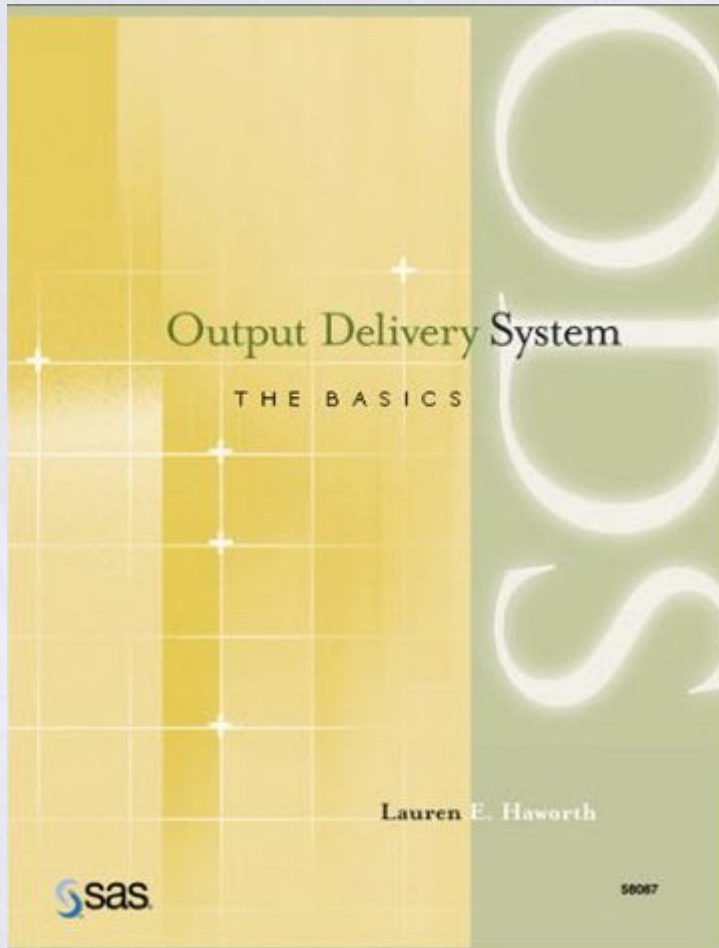
For the Ottawa Area SAS  
Users Society (O.A.S.U.S.)  
June 1<sup>st</sup>, 2011

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## Output Delivery System: The Basics and Beyond

Lauren E. Haworth  
Cynthia L. Zender  
Michele M. Burlew

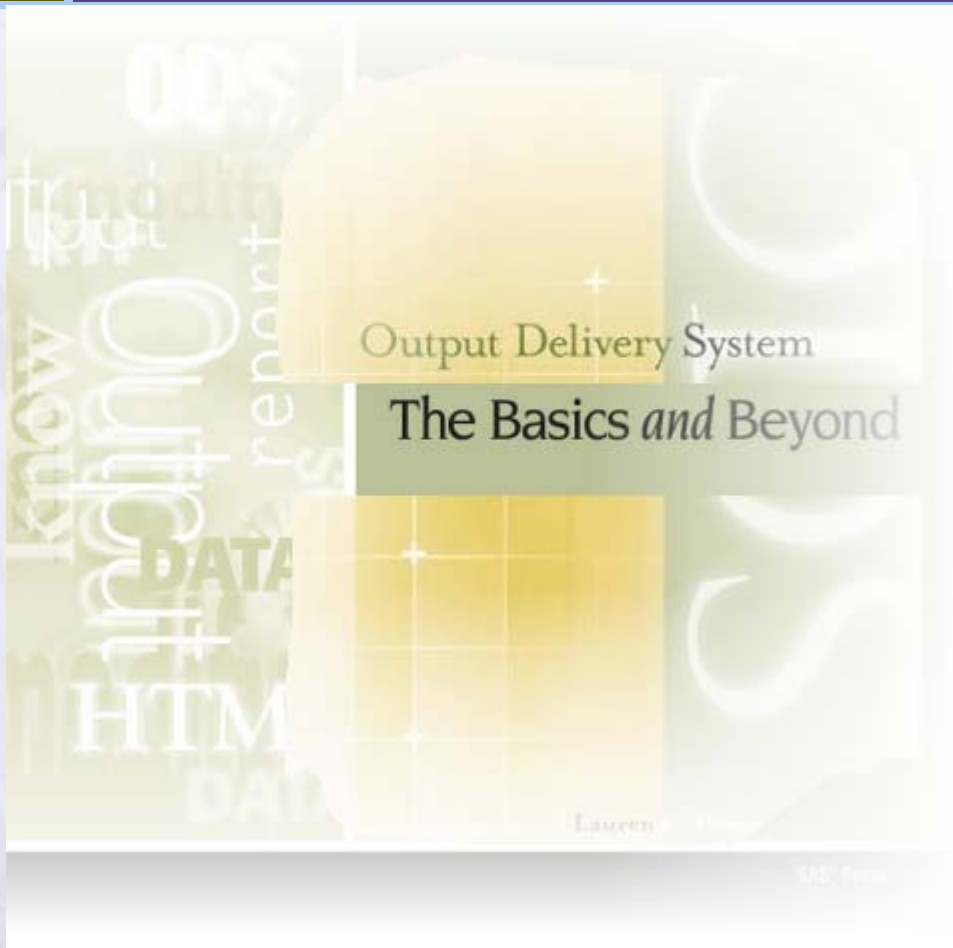
# ODS: The Basics *and* Beyond



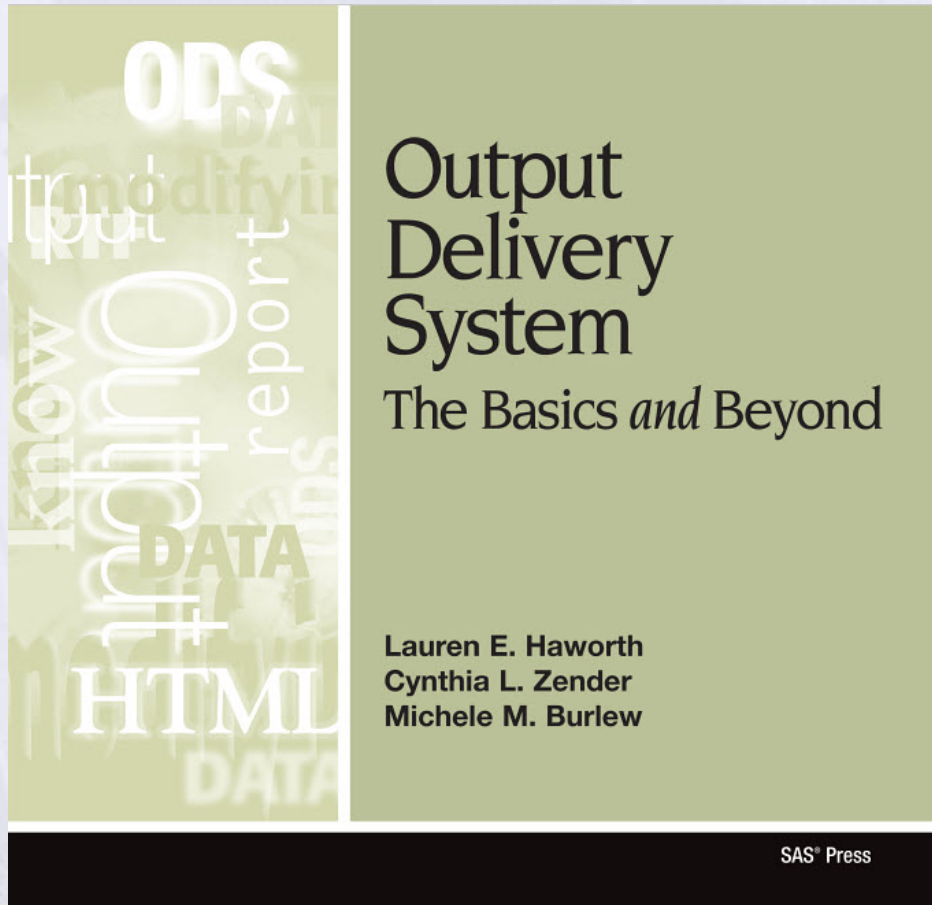
- ▶ ODS: The Basics, Previous book
- ▶ Published in 2001
- ▶ For SAS 8.2
- ▶ 302 pages
- ▶ Lauren Haworth

# ODS: The Basics *and* Beyond

- ▶ ODS: The Basics, Previous book
- ▶ Published in 2001
- ▶ For SAS 8.2
- ▶ 302 pages
- ▶ Lauren Haworth



# ODS: The Basics *and* Beyond



- ODS: The Basics and Beyond
- Published in 2009
- For SAS 9.2
- 610 pages
- Lauren Haworth
- Cynthia Zender
- Michele Burlew

# Lauren E. Haworth

- [www.laurenhaworth.com](http://www.laurenhaworth.com)
- “...over 50 technical papers and presentations at SAS local, regional, and international conferences...”
- Conference chair PNWSUG 2000, WUSS 2002 & 2006, SAS Global Forum 2010
- 20+ years SAS experience



Output Delivery System: The Basics and Beyond



PROC TABULATE by Example

# Cynthia L. Zender

- SAS Authors Page
- “...Manager for the Report Writing and ODS curriculum at SAS Institute Inc. ...”
- “...frequent speaker at SGF and regional SAS user groups...”
- 25+ yrs SAS experience

## [SAS Press - Cynthia Zender Author Page](#) 🔍

Cynthia Zender has been with SAS since 1996 as an instructor and course developer. She currently serves as the Curriculum Manager for the Report Writing and ... [support.sas.com/publishing/authors/zender.html](#) - Cached - Similar

## [Cynthia Zender - SAS blogs](#) 🔍

28 Feb 2011 ... Cynthia Zender A customer just recently posted this on our ... [blogs.sas.com/sastraining/index.php?/categories/5-Cynthia-Zender](#) - Cached

## [Proc REPORT Tutorial Cynthia L. Zender, SAS Institute, Inc., Cary, NC](#) 🔍

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## [Tiptoe through the Templates Cynthia L. Zender, SAS Institute, Inc. ...](#) 🔍

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## [SAS® Style Templates: Always in Fashion Cynthia L. Zender, SAS ...](#) 🔍

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by CL Zender - Related articles

Zender, Cynthia L. 2009. "CSSSTYLE: Stylish Output with ODS and SAS® ... Zender@sas.com. SAS and all other SAS Institute Inc. product or service names are ... [www.epi.soph.uab.edu/bugs/zender/033-2010.pdf](#)

# Michele M. Burlew

- SAS Authors Page
- Seven SAS books!
- From the broad range of topics, a wide and comprehensive understanding of SAS
- 25+ yrs SAS experience



*SAS Hash Objects: A Programmer's Guide*  
Anticipated publication date: Fall 2011



*Combining and Modifying SAS Data Sets: Examples, Second Edition*



*SAS Macro Programming Made Easy, Second Edition*



*SAS Guide to Report Writing: Examples, Second Edition*



*Reading External Data Files Using SAS: Examples Handbook*



*Debugging SAS Programs: A Handbook of Tools and Techniques*

# The Three Co-authors

Author	SAS Experience	Publications and Presentations
Lauren E. Haworth	20+ years	2 books and 50+ technical papers and presentations
Cynthia L. Zender	25+ years	1 book and numerous papers and presentations
Michele M. Burlew	25+ years	7 books
<b>All Together:</b>	<b>70+ years</b>	<b>10 books and countless papers and presentations</b>

- ▶ All this vast experience and expertise in SAS collected and concentrated into one book!

# Purpose of the book

- ▶ SAS Output Deliver System
- ▶ To “teach you how to use a wide array of ODS techniques through a series of step-by-step examples.”(page xv)
- ▶ “This book is aimed at all levels of SAS users from all disciplines.”(page xv)
- ▶ It is an “example-driven book”



# Example-driven Book

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- Approximately 285 organized, concise, and purposeful examples
- Two-page layout
  - the explanation and code is on the left page
  - the resulting output is on the right page
- Very convenient and straightforward to follow examples

# Side-by-Side Layout

## Limitations of SAS Listing Output

Before you can appreciate the wonder of ODS, you need to see where we're starting from. The series of simple procedures in the following example describe some sales data. There's a PROC FREQ step, a PROC UNIVARIATE step, and a PROC PRINT step that lists some outliers in the sales data.

```
options formdlim=' ';
title 'Frequencies';
proc freq data=sales;
  table ProductName Department;
run;
title 'Univariate';
proc univariate data=sales;
  var ItemsSold;
run;
title 'Outliers for Price';
proc print data=sales;
  where ItemPrice>13;
  var ItemPrice;
run;
```

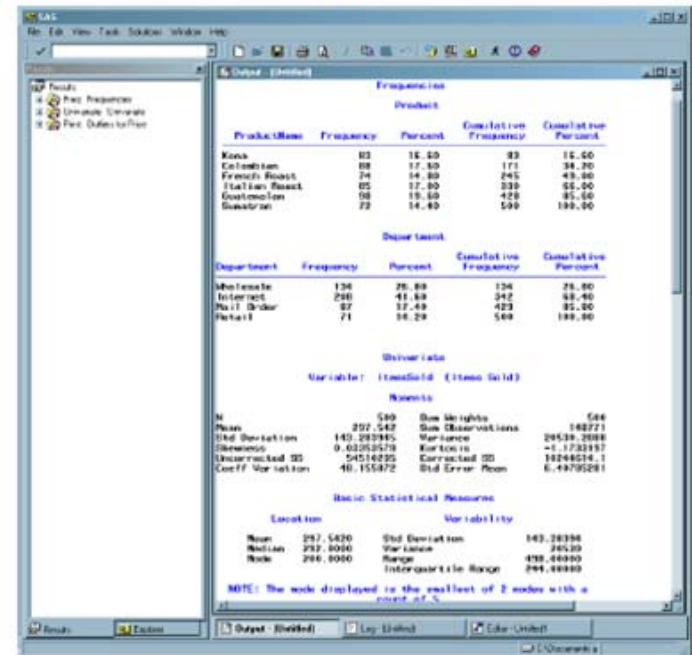
The procedures have been run in SAS 9.2, producing Figure 1.1. Because the program processes three different procedures, the resulting output is a series of three reports. The first report has two frequency tables, the second is a report with univariate statistics, and the third report shows line item details for the outliers. (Some of this output has been trimmed in order to fit the results on the page.) Figure 1.1 looks the same way in SAS@9 as it did back in SAS 6, or even SAS 5!

By default, SAS puts each procedure's results on a separate page. To keep this output as short as possible, the program specifies the FORMDLIM= option to remove the page breaks. However, even without the page breaks, the resulting output sprawls across a number of pages. In Figure 1.1, only the frequency tables and the first part of the univariate results fit on the first page.

If a reader of this report has time only to glance quickly at the top page, this output doesn't tell much of a story. You can't see all of the results. For example, what if the outliers for ItemsSold and ItemPrice are the most important message of the report? This information is buried on the second page. The extreme values for ItemsSold and the outlier report for ItemPrice can't be seen.


Also, this report is just plain ugly. Because this is SAS listing output, spaces are used to line up the columns of data and headings. This forces you to use a monospace font, rather than a proportional font. Proportional fonts (like the Times New Roman used for the text you are reading right now) are much easier to read. But if you used a proportional font with SAS listing output, nothing would line up. To see what SAS listing output would look like with a proportional font, look at Figure 1.2 on page 7.

Figure 1.1



(Remaining output not shown in order to fit results on this page.)

Snapshot from ODS: The Basics and Beyond Web Seminar by Zender and Burlew, 2009



# Parts of the Book

- ▶ Part 1: Introduction (2 chapters)
  - ▶ Terminology
- ▶ Part 2: Basics (3 chapters)
  - ▶ Usage and features for HTML, RTF, and PDF
- ▶ Part 3: Output Structure (7 chapters)
  - ▶ ODS techniques for display and layout
- ▶ Part 4: Output Style (8 chapters)
  - ▶ ODS techniques for appearance and format



# Chapters and Key Points

- ▶ Part 1: Introduction
  - ▶ Chapter 1: Why Use ODS?
  - ▶ Chapter 2: ODS Basics
    - ▶ Table and Style Definitions
    - ▶ Output Objects and Output Destinations
- ▶ Part 2: Basics
  - ▶ Chapter 3: HTML Output
  - ▶ Chapter 4: RTF Output
  - ▶ Chapter 5: PDF Output



# Chapters and Key Points

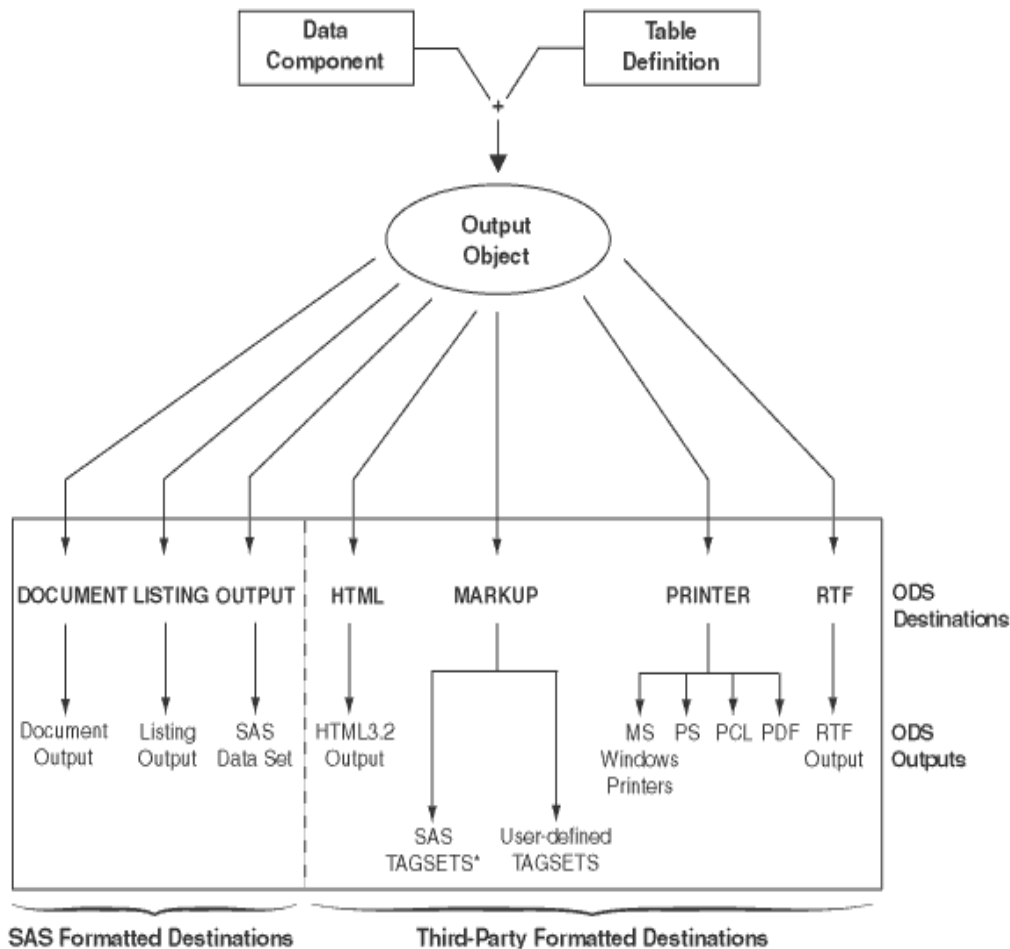
- Part 3: Output Structure (7 chapters)
  - Chapter 6: Exploring ODS Output
    - ODS TRACE statement
  - Chapter 7: Output Data Sets
    - ODS OUTPUT statement
  - Chapter 8: Limiting ODS Output
    - ODS SELECT or ODS EXCLUDE statement
    - As of SAS 9.2, also use a WHERE-statement
  - Chapter 9: Using ODS in the DATA Step
    - Default table definition/template

# Chapters and Key Points

- ▶ Part 3: Output Structure (continued)
  - ▶ Chapter 10: Creating Custom Reports from the DATA Step
    - ▶ PROC TEMPLATE for Custom Tables and Reports
  - ▶ Chapter 11: Modifying and Replaying ODS Output
    - ▶ ODS DOCUMENT and PROC DOCUMENT
  - ▶ Chapter 12: Using Tagsets to Generate MARKUP Output
    - ▶ ODS MARKUP

# ODS MARKUP

ODS Processing: What Goes In and What Comes Out



- Supplied TAGSETS
  - SAS
- Custom TAGSETS
  - User-defined
  - Customize a SAS one

\* List of Tagsets That SAS Supplies and Supports

CHTML	CSV	CSVALL	CSVBYLINE
DEFAULT	DOCBOOK	EXCELXP	HTML4
HTMLCSS	HTMLPANEL	IMODE	MSOFFICE2K
PHTML	PYX	RTF	SASREPORT
WML	WMLLIST	XHTML	

# Up To This Point

- “...The chapters so far have explained how to send output to various destinations and how to work with output objects”(page 345)
- From “Output Structure” in Part 3
  - Table Definitions and Templates
  - Display and Layout
- To “Output Style” in Part 4
  - Style Definitions and Templates
  - Appearance and Format

# Chapters and Key Points

- ▶ Part 4: Output Style (8 chapters)
  - ▶ Chapter 13: Style Template Definitions
  - ▶ Chapter 14: Understanding the Built-In Style Template Definitions
    - ▶ Default Style template → `modify` → Customized Style
  - ▶ Chapter 15: Modifying Output Fonts
  - ▶ Chapter 16: Modifying Output Structure
  - ▶ Chapter 17: Modifying Output Colors and Images

# Chapters and Key Points

- Chapter 18: Doing More with Styles and ODS
  - CSSSTYLE= Option
  - Creating a custom style for a custom table template
- Chapter 19: Special Cases: The Report, Tabulate, and Print Procedures
  - “... allow you to change the output style attributes on the fly when the output is generated.”(page 493)
- Chapter 20: Understanding ODS Graphics
  - ODS Statistical Graphics (SG) in SAS 9.2
    - SGPLOT, SGSCATTER, and SGPANEL procedures
    - Template-based graphics → SGRENDER



# Strengths of the Book

- ▶ Very well-written, thought-out, organized, and presented
- ▶ Example-driven approach, step-by-step, making it easy to learn and follow
- ▶ SAS ODS knowledge and usage offered is unsurpassed
- ▶ Excellent ODS reference text and a “best practices” guide to using ODS

# Weaknesses of the Book

- Entirely black-and-white and no colour in the ODS results
  - To get around this, you could run the example code to get the results **in colour**
  - Viewing the book by itself, this is a weakness but other resources related to the book are available from SAS Support that have **colour**
  - My opinion, I rather pay less for a black-and-white reference text than more for **colour**

# Resources




- ▶ <http://support.sas.com/publishing/authors/>



**Output Delivery System: The Basics and Beyond**  
Co-authors: [Michele Burlew](#), [Lauren Haworth](#), and  
Cynthia Zender


- ▶ [Free Chapter \(PDF\)](#)
- ▶ [Example Code and Data](#)
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 final_allpgms_913_rev.sas	48 KB	SAS System Program	13/11/2009 8:22 AM
 README.txt	2 KB	Text Document	13/11/2009 9:46 AM

# SAS Author WebPages

- ▶ <http://support.sas.com/publishing/authors/>

**Podcast** →  SAS Press authors Lauren Haworth, Cynthia Zender, and Michele Burlew participate in a lively exchange about collaborating on their highly anticipated upcoming book.

**Web Seminar** → **On-Demand Webinar** - "CSSSTYLE: Stylish Output with ODS and SAS 9.2"  
**Webinar:** Cynthia Zender and Michele Burlew offer expertise on using ODS.

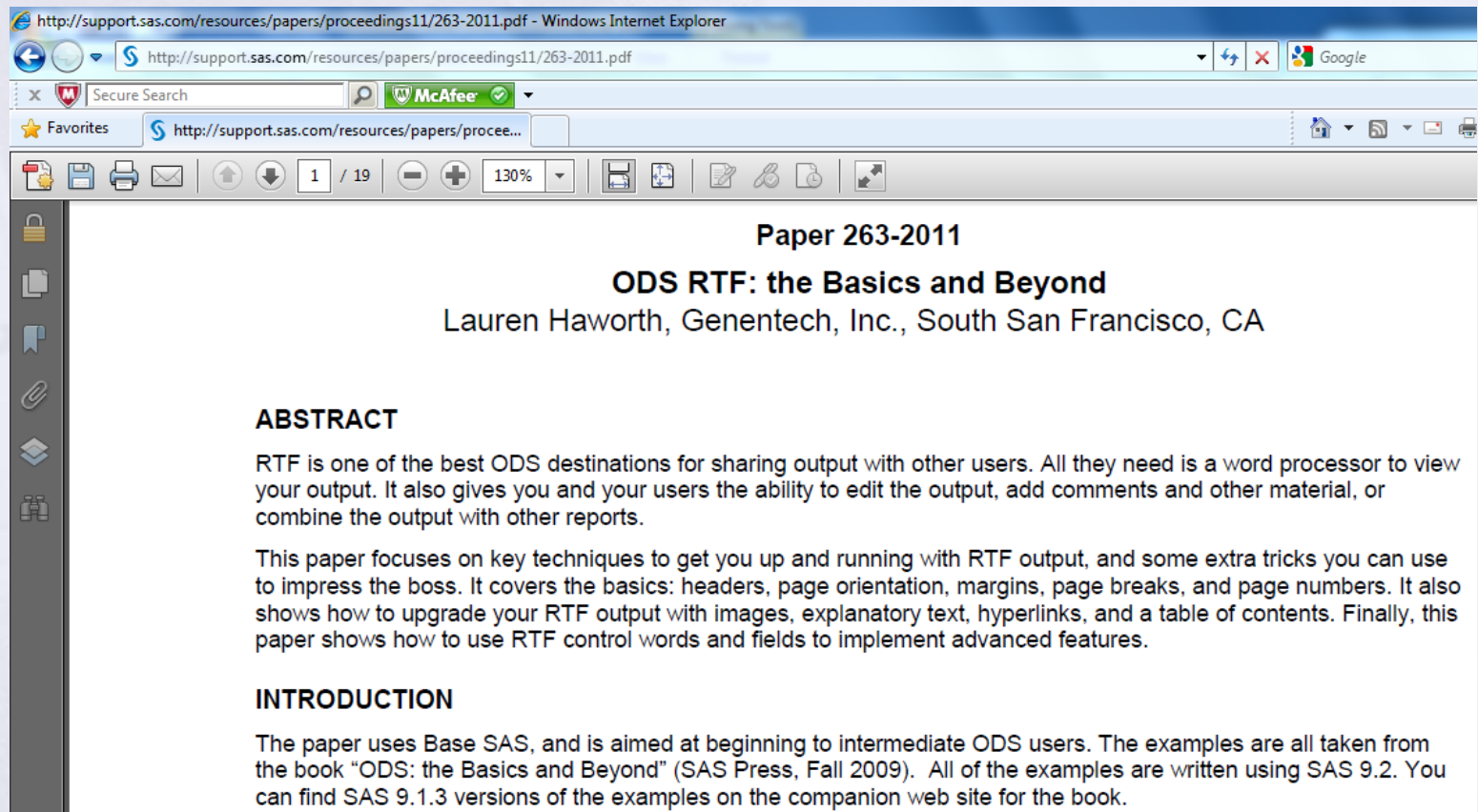
**Modifying Output Colors and Images** → **Book Chapter:** ODS - Chapter 17 Color Images

**The Report, Tabulate and Print Procs** → **Book Chapter:** ODS - Chapter 19 Color Images

**ODS Tip Sheets**

# Haworth Paper on ODS RTF

- ▶ <http://support.sas.com/resources/papers/proceedings11/263-2011.pdf>



The screenshot shows a Windows Internet Explorer browser window. The address bar contains the URL <http://support.sas.com/resources/papers/proceedings11/263-2011.pdf>. The page content is centered and includes the following text:

**Paper 263-2011**  
**ODS RTF: the Basics and Beyond**  
Lauren Haworth, Genentech, Inc., South San Francisco, CA

**ABSTRACT**

RTF is one of the best ODS destinations for sharing output with other users. All they need is a word processor to view your output. It also gives you and your users the ability to edit the output, add comments and other material, or combine the output with other reports.

This paper focuses on key techniques to get you up and running with RTF output, and some extra tricks you can use to impress the boss. It covers the basics: headers, page orientation, margins, page breaks, and page numbers. It also shows how to upgrade your RTF output with images, explanatory text, hyperlinks, and a table of contents. Finally, this paper shows how to use RTF control words and fields to implement advanced features.

**INTRODUCTION**

The paper uses Base SAS, and is aimed at beginning to intermediate ODS users. The examples are all taken from the book "ODS: the Basics and Beyond" (SAS Press, Fall 2009). All of the examples are written using SAS 9.2. You can find SAS 9.1.3 versions of the examples on the companion web site for the book.

# What I Learned – Templates!

- Templates are the blueprints behind ODS, ultimately defining every report and display of data in the ODS output
  - Table templates
  - Style templates
  - Tagset templates
  - Graph templates
- **PROC TEMPLATE**
  - The key to customized ODS results

# PROC TEMPLATE

```
/* page 274, Chapter 10: Creating Custom Reports from the DATA step */
❑ proc template;
    define table tables.hr_table;
        column Department AnnualSalary BonusAmt NewSal;
        ...
run;

/* page 335, Chapter 12: Using Tagsets to Generate MARKUP Output */
❑ proc template;
    define tagset tagsets.partsauction / store=work.tagtemp;
        define event doc;
        ...
run;

/* page 480, Chapter 18: Doing More with Styles and ODS */
❑ proc template;
    define style styles.smaller;
        parent = styles.printer;
        ...
run;

/* page 552, Chapter 20: Understanding ODS Graphics Output */
❑ proc template;
    define statgraph compare;
        begingraph;|
        ...
run;
```



# Concluding Remarks

- ▶ The definitive text on SAS ODS
- ▶ Not just a collection of examples but also the accumulation of the experience, insight, and best practices from 3 SAS experts
- ▶ I hope that your interest is peaked about ODS from this book review and that you will explore it for yourself



# Future Book Reviews You Can Do

- ▶ For books of interest, visit the website:  
<http://support.sas.com/publishing/>
- ▶ Indicate that you are interested on the evaluation form
- ▶ Contact Josée Blackburn at  
[jblackburn@ohri.ca](mailto:jblackburn@ohri.ca)
- ▶ Thank You!



# Acknowledgements

- ▶ To Josée Blackburn and Laki Kourakis for the opportunity to review the book
- ▶ To John Ladds for his suggestions
- ▶ To Cynthia Zender (from the SGF 2011), Lauren Haworth, and Michele Burlew for an awesome ODS book
- ▶ To my wife for her patience and support

# The End

## Output Delivery System:

### The Basics and Beyond

Lauren E. Haworth

Cynthia L. Zender

Michele M. Burlew