The following links were compiled during preparation of the presentation: "Introduction to Popular GIS Vector Data Structures". The compiled and listed links were used or tested during **February of 2009**. Some links point to available GIS data local to Washington. Other links refer to white papers or technical references, many from ESRI.

INTRODUCTION

Definitions

Selected definitions that are easily discovered, interesting, or widely used to qualify the presentation discussion; definitive qualities of definitions are often the subject of debate.

Geography
http://www.merriamwebster.com/dictionary/geography
http://www.experiencefestival.com/a/Geography/id/1895195

Data
http://www.merriamwebster.com/dictionary/data

Geographic
http://www.merriamwebster.com/dictionary/geographic

Information System
http://www.britannica.com/EBchecked/topic/287895/information-system

Geographic Information System
http://www.esricanada.com/english/6622.asp

BACKGROUND

Knowledge Management

Data, Information, Knowledge, and Wisdom.
http://www.systems-thinking.org/kmgmt/kmgmt.htm

GIS Time Line's

There are several web references for timelines associated with GIS. Here are some of my favorites.
http://www.casa.ucl.ac.uk/gistimeline
http://www.gisdevelopment.net/history/index.htm
http://www.gisuser.com/content/view/11991/53/
ESRI's version is available for view at the International Map Trade Organization:
http://www.maptrade.org/docs/other/1MapChartTimeline07.pdf
http://www.maptrade.org/docs/other/2MapChartTimeline07.pdf
http://www.maptrade.org/docs/other/3MapChartTimeline07.pdf
http://www.maptrade.org/docs/other/4MapChartTimeline07.pdf
http://www.maptrade.org/docs/other/5MapChartTimeline07.pdf
http://www.maptrade.org/docs/other/6MapChartTimeline07.pdf

Waldo Tobler

Esteemed graduate student at the University of Washington that is credited with the first academic GIS called MIMO (Map In Map Out) via work with Automated Cartography.
http://www.geog.ucsb.edu/~tobler/

ARC/INFO: A Geo-Relational Model for Spatial Information

Scott Morehouse outlines the ArcInfo model with descriptions of the coverage and database schemes that were analyzed with respect to the development of Arc/INFO.
http://mapcontext.com/autocarto/proceedings/auto-carto-7/pdf/arcinfo-a-geo-relational-model-for-spatial-information.pdf

The Architecture of ARCINFO

Scott Morehouse outlines principles in the development of Arc/INFO.
http://mapcontext.com/autocarto/proceedings/auto-carto-9/pdf/the-architecture-of-arcinfo-smorehouse-environmental-systems-research-institute.pdf

A History of Twentieth-Century Academic Cartography

This paper outlines some of the major cartography programs in the US including the University of Washington. It is not difficult to find elements of computer cartography within the GIS systems of today.
McMaster R., McMaster S. (2002). A History of Twentieth-Century American Academic Cartography. *Cartography and Geographic Information Science, Vol. 29, No. 3, pp. 305-321.*
http://www.geography.wisc.edu/histcart/v6initiative/13mcmaster.pdf

Scales of Measurement

Classification scheme widely used within statistics. Links below clarify testing methods and operations per category and problems with categorical classifications.
http://web.uccs.edu/lbecker/SPSS/scalemeas.htm
http://www.geog.ubc.ca/courses/klink/gis.notes/ncgia/u06.html#SEC6.4.5
http://www.cs.uic.edu/~wilkinson/Publications/stevens.pdf
http://www.ncgia.ucsb.edu/education/curricula/giscc/units/u037/u037.html

WASHINGTON GIS

Procedures for Converting GIS Data from NAD27 to NAD83 in Support of the Washington State Standard on Horizontal Datum and Coordinate System
This is a white paper that explores problems with utilizing software to project data within the state. It takes a critical look at issues with accuracy and precision associated with software projections and is a nice reference.
Fischer, F., Young, T, Daniels, R., Tudor, G., Kennedy, M., Barrette, J. and J. Paulus. 2003. *Procedures for Converting GIS Data from NAD27 to NAD83, In Support of the Washington State Standard on Horizontal Datum and Coordinate System*. White Paper, Washington Geographic Information Council, Information Services Board, Washington State Department of Information Services, Olympia, WA.
http://wagic.wa.gov/Techstds2/NAD83ProjectionPaper2.doc

Pierce County GIS Data Express
Available Pierce County Data listing with links to themes. Of 244 themes, several vector layers available in: Shapefile, Coverage, Export, and DXF forms.
http://yakima.co.pierce.wa.us/GeoDataExpress/main.html

King County GIS Data Distribution
King County data distribution order/purchase page with order forms for vector and imagery data. "Beginning in March 2009" the Standard Disc will be in geodatabase format. (shapefiles can be obtained through a custom order)
http://www.kingcounty.gov/operations/GIS/GISData/GISDataDistribution.aspx

GIS DATA (GENERAL INFORMATION)

Topology Basics
This section of ArcGIS Desktop Help is located by traversing the table of contents through the following sections and sub-setions:
Geodatabases and ArcSDE
Building a geodatabase
Working with geodatabase datasets
Topologies
http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Topology_basics

Map Topology
This is a small, straight forward tutorial that explains how to use Map Topology even with only an ArcGIS, ArcView license. ArcEditor or ArcInfo are required for full topology defined within the geodatabase. Collin Child's tutorial shows how to work with coincident polygons of a sample parcel feature dataset. His tutorial is well prepared and easy to use. My only critcism, I would recommend not using a "parcel" feature dataset for an example of a theme to use for "mouse" edits.
http://www.esri.com/news/arcuser/0703/files/av_topo_tut.pdf

MOSS (Map Overlay and Statistical System)
Developed in 1978 largely based on requirements established by the USFWS to respond to needs. First non-commercial and widely used GIS developed on mini-computers.
http://www.scribd.com/doc/4606038/2004-Article-by-Carl-Reed-MOSS-A-Historical-perspective

Open Geospatial Consortium
Founded in 1994 largely from users of GRASS (Army Core of Engineers), MOSS (Dept. of Agriculture) and others, to include commercial participant Integraph, a non-ESRI effort to define interoperability standards for geospatial information. In 1997 the Simple Features specification was released and work began to coordinate ISO TC 211. ESRI was a major author for the specification (post shapefile).
http://www.opengeospatial.org/ogc/history

Vector Format Options
Short paper that describes differences between coverages and shapefiles.
http://nsidc.org/noaa/iicwg/pdf/esri_vector_options.pdf

ESRI COVERAGE

Arc/Info Binary Coverage Format Analysis
A look at the coverage data files via file dumps by Daniel Morissette (2006). This gives some information that you will not find elsewhere today.
http://avce00.maptools.org/docs/v7_bin_cover.html

Coveage Data Limitations

Discusses physical limits regarding data file sizes and limitations regarding coverage feature tables.
http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm?id=3276&pid=3261&topicname=Coverage_data_limitations

ESRI SHAPEFILE (1994)

A Short History Lesson on Simple Features
ESRI was the lead author on the ISO and OGC simple features standard. This concept was first used within shapefiles and brought forward in later RDBMS models.
http://webhelp.esri.com/arcgisserver/9.3/dotNet/index.htm#geodatabases/a_short_hi9898730.htm

Understanding Topology and Shapefiles
This short and concise article by David Theobald written for ArcUser explains differences between coverages and shapefiles. It points out that one might approach topology during data entry by careful editing of shapefiles. It also points out that planar topology may not be necessary for some applications.
http://www.esri.com/news/arcuser/0401/topo.html

Shapefiles
Detailed technical description of shapefile components to include data dictionary descriptions (byte layout of files) for different feature types and attributes.
http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf

Geoprocessing Considerations for Shapefile Output
The section of the ESRI ArcGIS Desktop help concisely list many of the limitations of shapefiles along with comparisons to geodatabase formats.
http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm?TopicName=Geoprocessing%20considerations%20for%20shapefile%20output

Shapefiles (Wikipedia)
Very good and detailed technical description of shapefile components to include data dictionary descriptions (byte layout of files) for different feature types and attributes.
http://en.wikipedia.org/wiki/Shapefile

XTools for ArcView 3.x
Free download that allows some topological operations on shapefiles. The version for ArcGIS 9.x is called XTools Pro and is no longer for free, though it can be used for a 30 day trial.
http://arcscripts.esri.com/details.asp?dbid=11526

Free Tools for Shapefiles
A collection of tools written to examine and manipulate shapefiles by Frank Warmerdam. Frank also wrote “FW Tools” which is an open GIS application. If you load this software you have access to a lot of the OGR tools.
http://shapelib.maptools.org/shapelib-tools.html

ESRI GEODATABASE (1999)

Types of Geodatabases
File, personal, and SDE geodatabase are described side-by-side with a table that includes size limitations and descriptions of the environments in which they are used.
http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=Types_of_geodatabases

ArcGIS Working with Geodatabase Topology
ESRI white paper from May 2003 with details about setting about using OO oriented topologies through the geodatabase with ArcMap and ArcCatalog. Some of the interfaces have probably been updated but the overall discussion is useful.
http://www.esri.com/library/whitepapers/pdfs/geodatabase-topology.pdf

OTHER STUFF

Geocommunity Software
This page has a list of GIS data translators available including IMPORT71 to convert e00 files to coverages along with many more.
http://software.geocomm.com/translators/arcview/

FreeGIS.org
The link below is to the database of software available for free. It is easy to see that since the shapefile format was released many took advantage by developing conversion tools.
http://www.freegis.org/database/?cat=0

Hawth's Analysis Tools for ArcGIS
Collection of tools useful for vector and raster analysis. The tools are for free; some are specific to ecological applications but some are general in nature by Hawthorne Beyer.
http://www.spatialecology.com/htools/tooldesc.php