Data Action Lab

Sysabee

DAVHILL Group

IDLEWYLD

Enseignement univ.: 50+ cours; **ateliers:** 40+; **projets:** 60+; **expérience combinée:** 35+ années.
Co-entreprise pré-qualifiée à la liste des fournisseurs I.A. du GdC – EN578-180001/A (1ière bande).

Nouveau catalogue de formation approfondie disponible sur la toile au **data-action-lab.com**

Combined experience: 50+ university courses, 100+ corporate workshops, 60+ projects, 35+ years.
Joint venture qualified for GoC A.I. Source List – EN578-180001/A (Band 1).

New advanced training catalogue available at **data-action-lab.com**

Data Action Lab

What We Do

- Training and long courses
- Workshops and short courses
- Knowledgebase curation
- Data labs

Data Action Lab

Training

Training Paths

- Data Novice
- Data Engineer
- Data Practitioner
- Data Scientist
- Data Manager
- Data Champion

Training Learning Interests

- Visualization and Dashboards
- Introduction to Data Science
- Advanced Data Science
- Machine Learning Toolbox
- Spotlight on Classification
- Spotlight on Clustering
- Text Analysis
- Special Topics in AI and DS
- Hands on Data Analysis
- Data Strategy and Governance

Data Action Lab

Expertise

Business intelligence
Data visualization design
Data analytics and data science
Data engineering
Advanced statistics and machine learning
Artificial and augmented intelligence
Process and systems modeling
Software implementation and integration

Data Action Lab

Vision

- Provide a space for data consumers, producers, practitioners, scientists and champions to make a place for themselves in the digital world.
- Provide paths for education and enrichment for all these groups.
- Keep pace with developments in the digital arena and keep Data Action Lab participants moving and aligned with these relevant developments.
- Provide just-in-time learning opportunities for Data Action Lab members, focusing on their specific challenges and skillsets.

PBI-1: AN OVERVIEW OF POWER BI

DATA ACTION LAB – POWER BI SERIES

COURSE OVERVIEW

Course #: PBI-1 **Duration:** 0.5 day
Course Title: Introduction to Power BI

Description:

Getting Things Ready

- Power BI Walkthrough
- Importance of Clean Data
- Importing and Manipulating Data

A First Visualization

- Calculations
- Custom Columns
- Charts

Making Things Dynamic

- Basic Interactive Filtering
- Basic Hierarchies of Data
- Dashboard and Report Layout

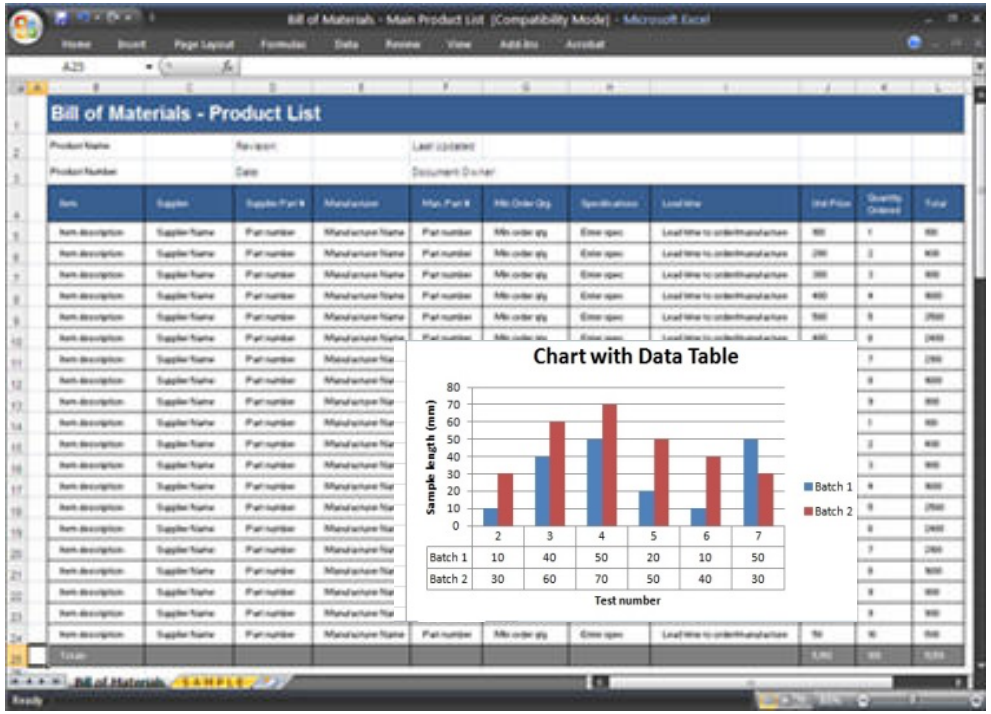
INTRODUCTION

PBI-1: AN OVERVIEW OF POWER BI

OVERVIEW

The past is **data-driven:**

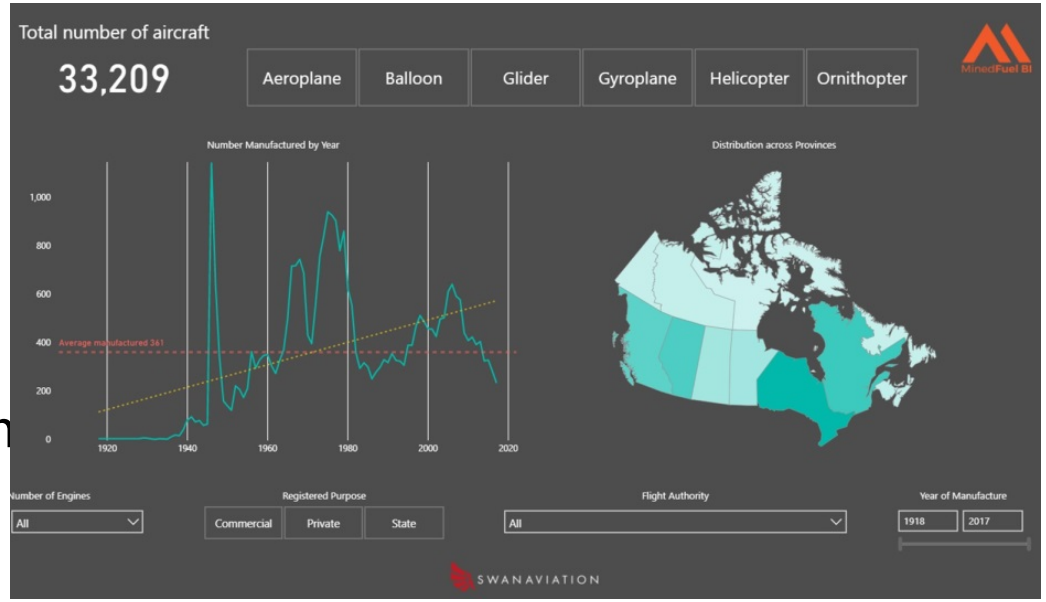
- mostly Excel (or reporting tools like Cognos)
- mostly numbers, tables and non-interactive graphs
- distributed on desktop computers, by email, in PowerPoint presentation
- static, mostly backwards looking (lagging indicators)
- KPIs and dashboards were somewhat contrived



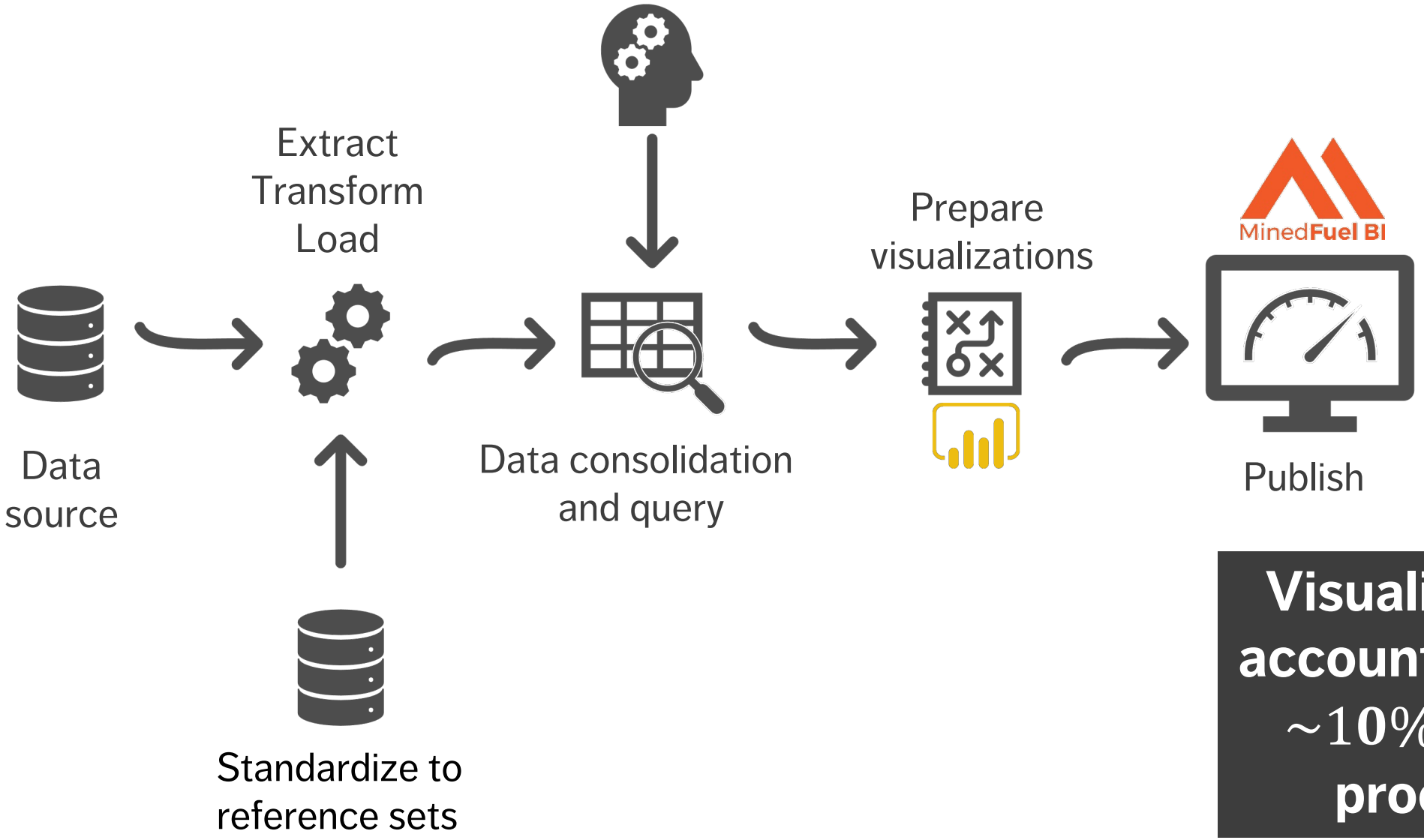
OVERVIEW

The future is **story-driven:**

- new tools: Power BI, R, Qlickview etc.
- mostly visualizations, occasional numbers and tables
- distributed on the web (internal and external)
- dynamic and both backwards and forwards lookin (leading and lagging indicators)
- data is for everyone



STRUCTURE OF DATA PROJECTS



Visualizations account for only ~10% of the process.

RESOURCES

https://www.data-action-lab.com/index.php/category/data-tools/power-bi/

https://www.data-action-lab.com/index.php/event-espresso-test-page/ (filter for data lab events)

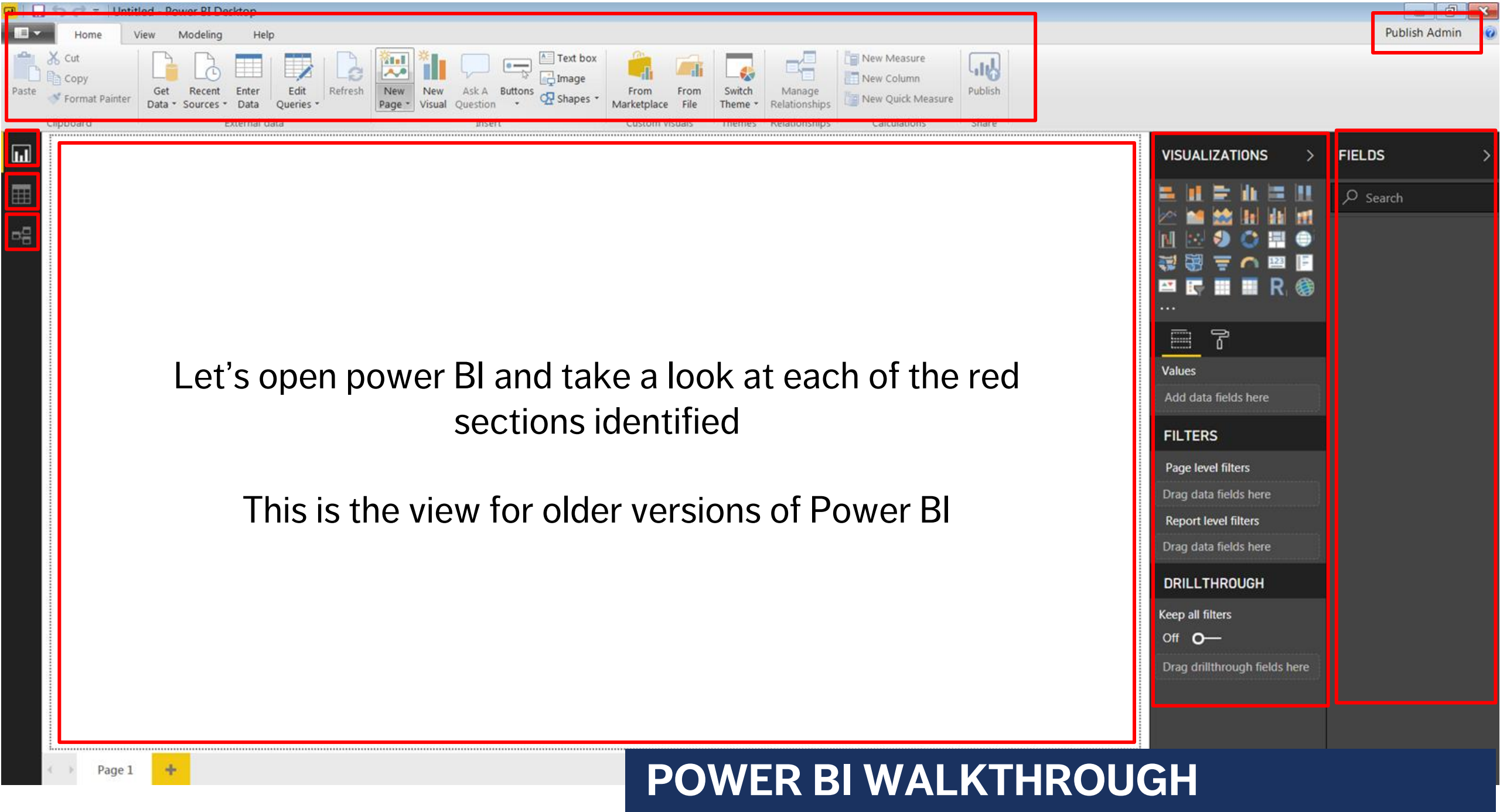
http://www.davhill.com/free-online-training/

http://www.davhill.com/open-data-resources/

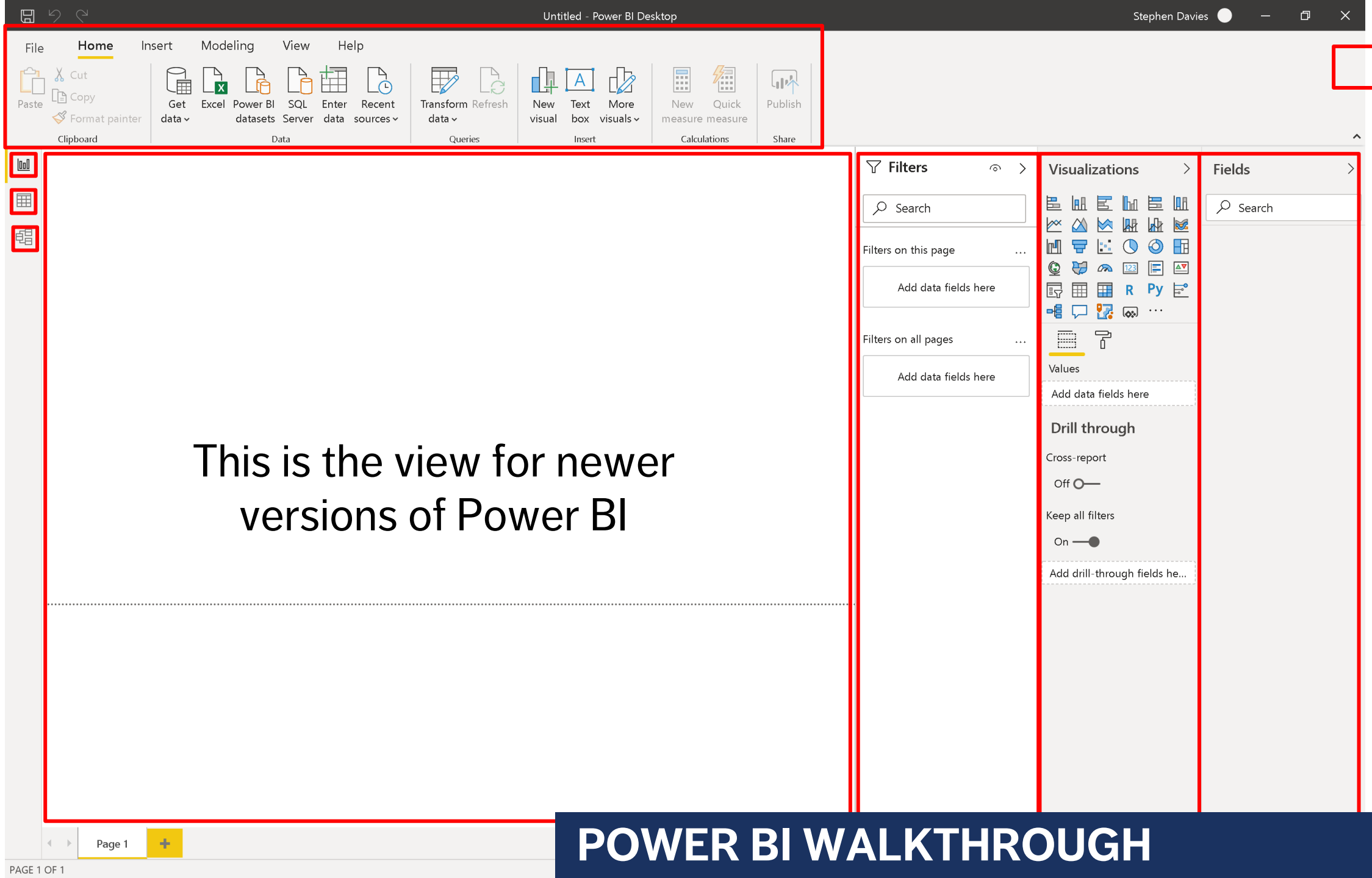
https://docs.microsoft.com/en-us/power-bi/guided-learning/

GETTING THINGS READY

PBI-1: AN OVERVIEW OF POWER BI



POWER BI WALKTHROUGH


Untitled - Power BI Desktop
Stephen Davies
File
Home
Insert
Modeling
View
Help
Paste
Cut
Copy
Format painter
Clipboard
Get data
Excel
Power BI datasets
SQL Server
Enter data
Recent sources
Data
Transform data
Refresh
Queries
New visual
Text box
More visuals
Insert
New measure
Quick measure
Calculations
Publish
Share
This is the view for newer versions of Power BI
Filters
Search
Filters on this page
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Values
Add data fields here
Drill through
Cross-report
Off
Keep all filters
On
Add drill-through fields he...
Fields
Search
Page 1
PAGE 1 OF 1
POWER BI WALKTHROUGH

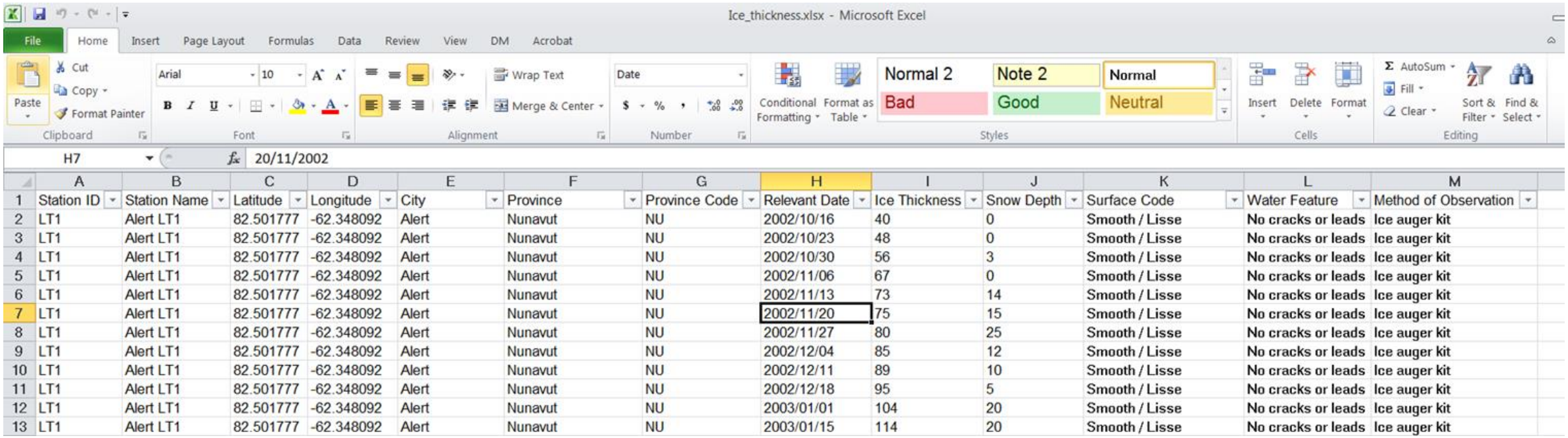
IMPORTANCE OF CLEAN DATA

BINGO!!!!

random missing values	outliers	values outside of expected range - numeric	factors incorrectly/iconsistently coded	date/time values in multiple formats
impossible numeric values	leading or trailing white space	badly formatted date/time values	non-random missing values	logical inconsistencies across fields
characters in numeric field	values outside of expected range - date/time	DCB!	inconsistent or no distinction between null, 0,not available, not applicable,missing	possible factors missing
multiple symbols used for missing values	???	fields incorrectly separated in row	blank fields	logical iconsistencies within field
entire blank rows	character encoding issues	duplicate value in unique field	non-factor values in factor	numeric values in character field

IMPORTING AND MANIPULATING DATA

Open the file “Ice_thickness.xlsx” and take a look at the data.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Station ID	Station Name	Latitude	Longitude	City	Province	Province Code	Relevant Date	Ice Thickness	Snow Depth	Surface Code	Water Feature	Method of Observation
2	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/10/16	40	0	Smooth / Lisse	No cracks or leads	Ice auger kit
3	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/10/23	48	0	Smooth / Lisse	No cracks or leads	Ice auger kit
4	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/10/30	56	3	Smooth / Lisse	No cracks or leads	Ice auger kit
5	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/11/06	67	0	Smooth / Lisse	No cracks or leads	Ice auger kit
6	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/11/13	73	14	Smooth / Lisse	No cracks or leads	Ice auger kit
7	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/11/20	75	15	Smooth / Lisse	No cracks or leads	Ice auger kit
8	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/11/27	80	25	Smooth / Lisse	No cracks or leads	Ice auger kit
9	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/12/04	85	12	Smooth / Lisse	No cracks or leads	Ice auger kit
10	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/12/11	89	10	Smooth / Lisse	No cracks or leads	Ice auger kit
11	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2002/12/18	95	5	Smooth / Lisse	No cracks or leads	Ice auger kit
12	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2003/01/01	104	20	Smooth / Lisse	No cracks or leads	Ice auger kit
13	LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	2003/01/15	114	20	Smooth / Lisse	No cracks or leads	Ice auger kit

IMPORTING AND MANIPULATING DATA

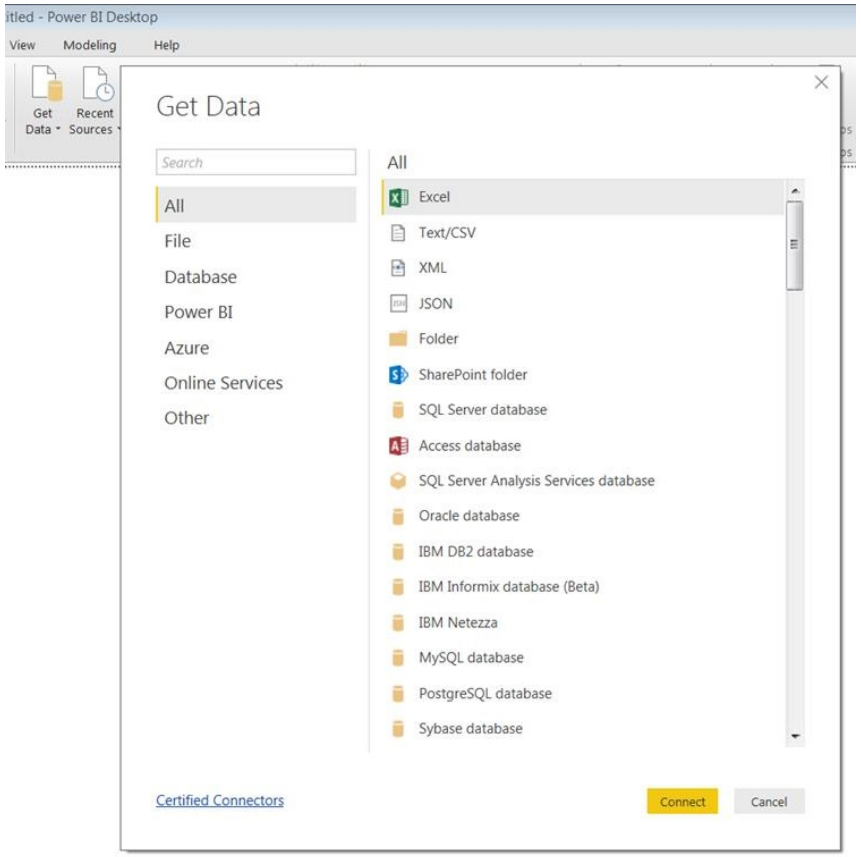
To import the data into Power BI, use:

- SQL ***before*** data import (not covered here)
- M ***during*** data import (high level look only)
- DAX ***after*** data import (somewhat in-depth look)

Save the Excel file and create a new Power BI file.

Click on the “Get Data” button and follow the instructions (select the “Data” tab).

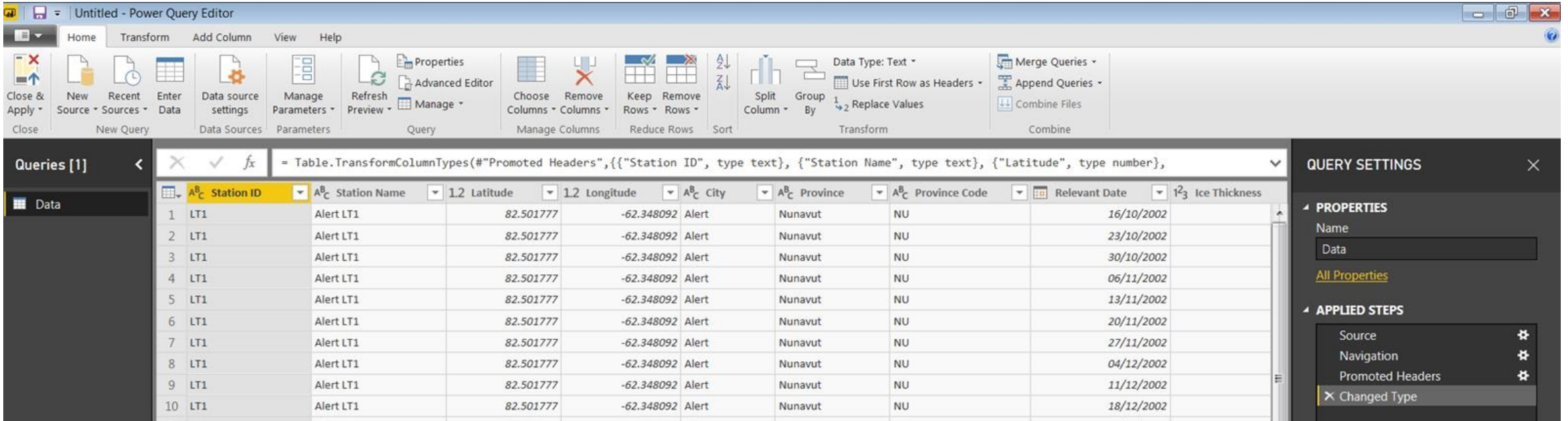
(Make sure to click on “Edit” and not on “Load”)



IMPORTING AND MANIPULATING DATA

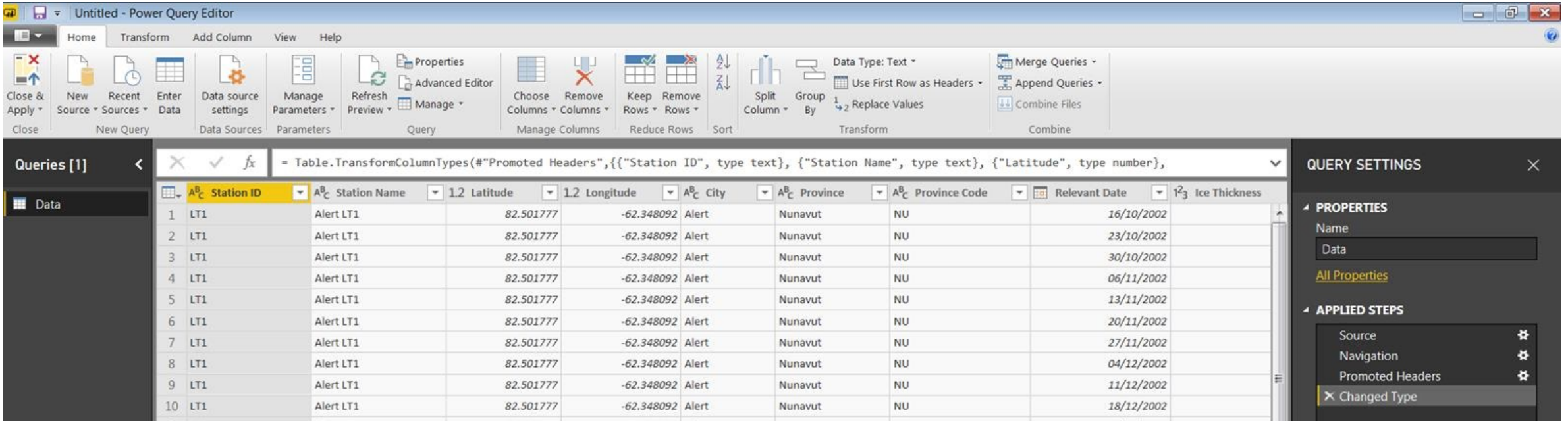
Typically, we want to “tweak” the data before loading it into Power BI.

This can be done using the “Power Query” Interface. **NOTE:** this query IS extremely powerful, but there is NO reason to get scared as long as things are kept simple.



IMPORTING AND MANIPULATING DATA

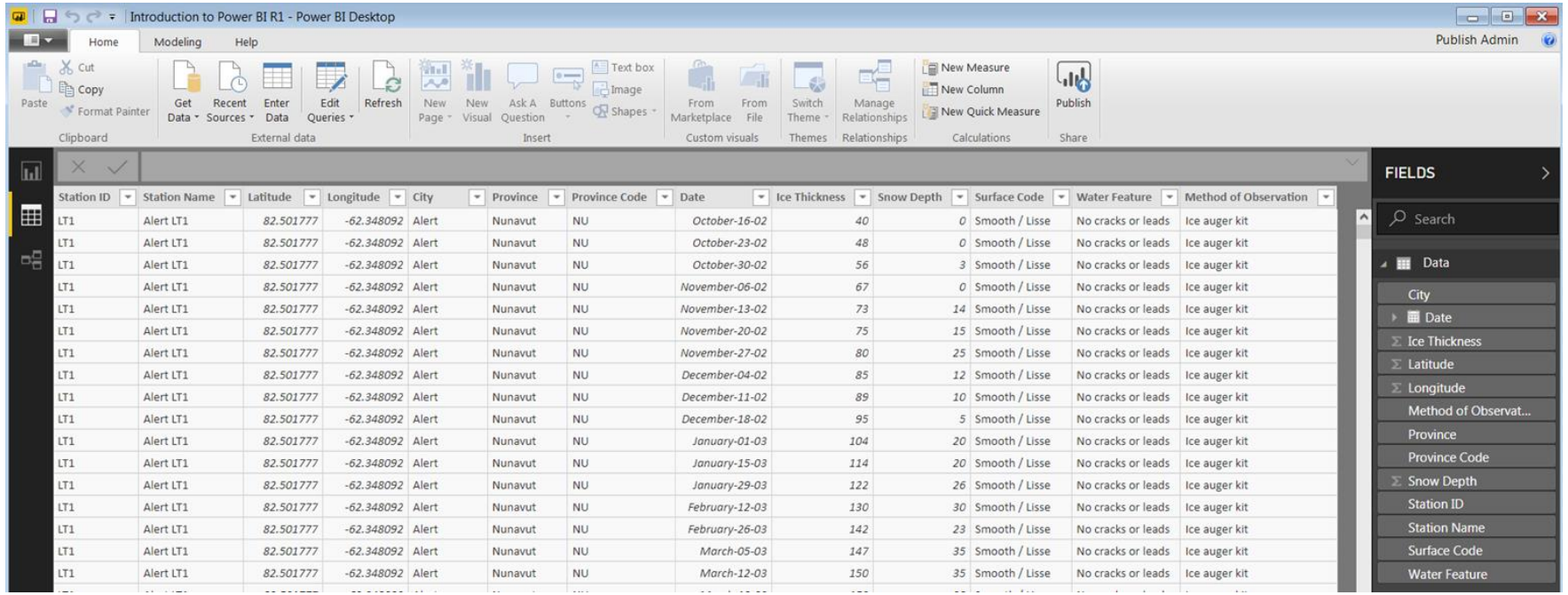
For now, simply change the name of a column, then hit “Close and Apply”.



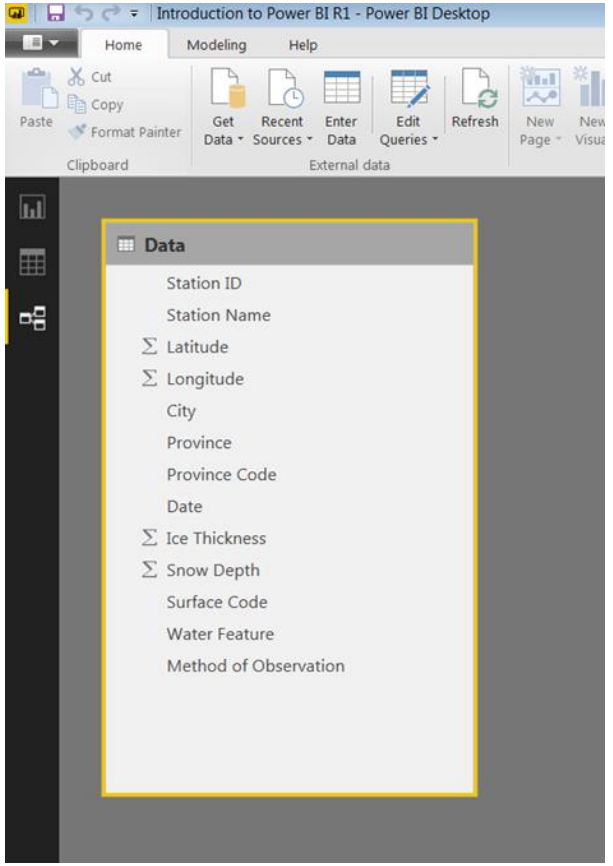
IMPORTING AND MANIPULATING DATA

In the walkthrough, we briefly looked at the “Data”, “Model” tabs.

Let’s take another look at the data now that it is loaded in.



Station ID	Station Name	Latitude	Longitude	City	Province	Province Code	Date	Ice Thickness	Snow Depth	Surface Code	Water Feature	Method of Observation
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	October-16-02	40	0	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	October-23-02	48	0	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	October-30-02	56	3	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	November-06-02	67	0	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	November-13-02	73	14	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	November-20-02	75	15	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	November-27-02	80	25	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	December-04-02	85	12	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	December-11-02	89	10	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	December-18-02	95	5	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	January-01-03	104	20	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	January-15-03	114	20	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	January-29-03	122	26	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	February-12-03	130	30	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	February-26-03	142	23	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	March-05-03	147	35	Smooth / Lisse	No cracks or leads	Ice auger kit
LT1	Alert LT1	82.501777	-62.348092	Alert	Nunavut	NU	March-12-03	150	35	Smooth / Lisse	No cracks or leads	Ice auger kit

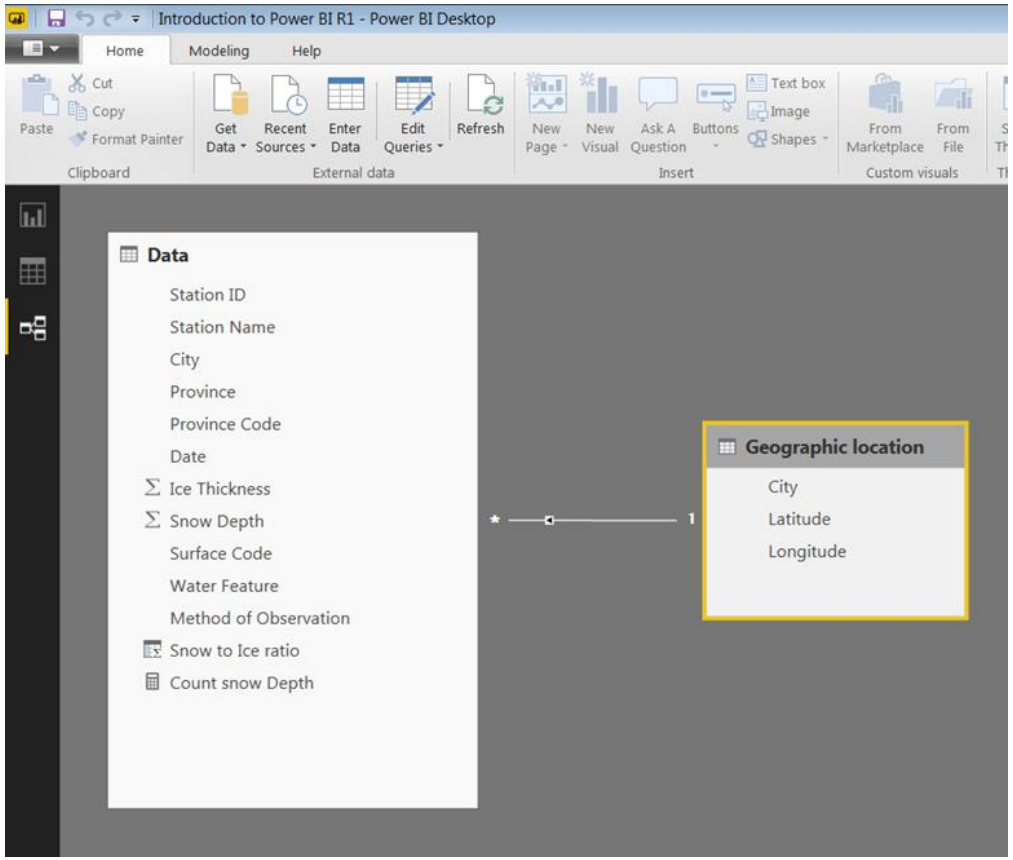


IMPORTING AND MANIPULATING DATA

A useful functionality of Power BI is the ability to **“link” tables of data**.

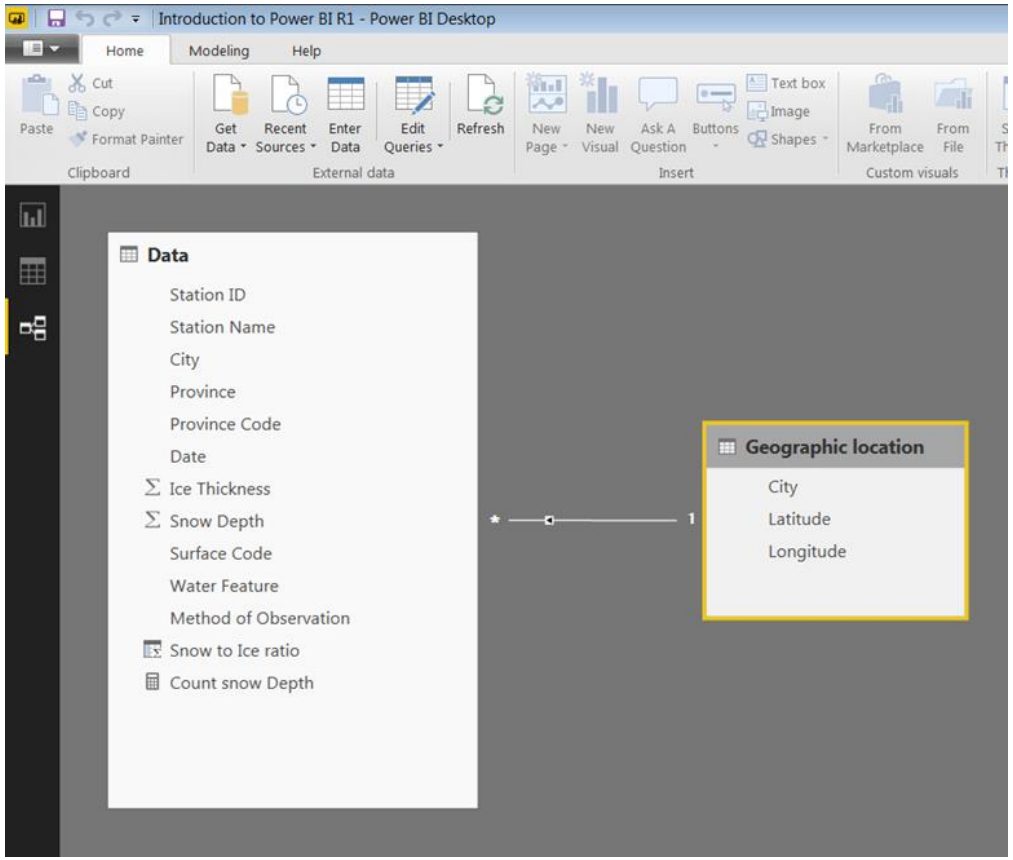
To add a Latitude/Longitude cross-reference table (see tab in the spreadsheet):

- click “Get Data”, then “Excel”, then select “Ice_thickness.xlsx”;
- Next, select the “Geographic Location” tab and hit “Load”.



IMPORTING AND MANIPULATING DATA

Looking at look at the “Model” tab, we can see that Power BI has **automatically detected** the link between the 2 tables using the “City” field.



IMPORTING AND MANIPULATING DATA

We will revisit this much more in detail later in the course and in subsequent courses.

Creating and linking cross tables like this gives Power BI **MUCH** more analytic power than Excel...

... but we need to make sure (as per the cleaning data section) that **EVERY** data source is squeaky clean otherwise the relationships will break.

A FIRST VISUALIZATION

PBI-1: AN OVERVIEW OF POWER BI

CALCULATIONS

In Excel, formulas are entered in cells; in Power BI, only columns can be worked with. In Power BI, the language that is used for calculations is called **DAX**.

DAX is a collection of

- functions, operators, and constants
- that can be used in a formula, or expression, to calculate and return one or more values.

DAX helps create new information from data already found in the model.

Great resource:

- https://docs.microsoft.com/en-us/power-bi/guided-learning/introductiontodax

CALCULATIONS – SYNTAX

This formula's syntax includes the following elements:

```
Total Sales = SUM(Sales[SalesAmount])
```

- the measure name is `Total Sales`
- the operator "=" indicates the beginning of the formula; when calculated, it returns a result
- the DAX function `SUM` adds all of the numbers in the `Sales[SalesAmount]` column
- parenthesis `( )` surround an expression containing one or more arguments; all functions require at least one argument, which passes a value to a function
- the referenced table `Sales`
- the referenced column `[SalesAmount]` in the `Sales` table; with this argument, the `SUM` function knows on which column to aggregate

CALCULATIONS

Follow along to create your first simple calculation, the total number of Snow Depth Records:

- click on “New Measure”
- in the text field add the following DAX code:

```
Count snow Depth = count(Data[Snow Depth])
```

To verify that the calculation is working, add a card to the display.

CALCULATIONS – ARITHMETIC FUNCTIONS

The previous slide shows a standard use of `SUM`; DAX has the expected standard arithmetic expressions (`SUM`, `DIVIDE`, `PRODUCT`, `MAX`, `MIN`, `AVERAGE`, etc.)

But don't give in to the temptation to manually divide using a "`/`" operation, say (although everybody does and sometimes it is ok) – there is a failure option built into (for example) `DIVIDE` (or an alternate result, such as "`0`" for a "divide by 0" error).

```
DIVIDE(<numerator>, <denominator> [,<alternateresult>])
```

Spend a few minutes on a new tab playing around with these expressions; we will see them in action in a short while.

CUSTOM COLUMNS

We just created a "**Measure**", namely a calculation that does not relate to any specific row of data.

It changes as the data gets filtered.

In order to add a specific piece of new information to each ROW of data, we may need to add a **custom COLUMN**.

We can still use DAX to do this.

Note that adding a new column will increase the overall size of our dataset, but using a measure does not.

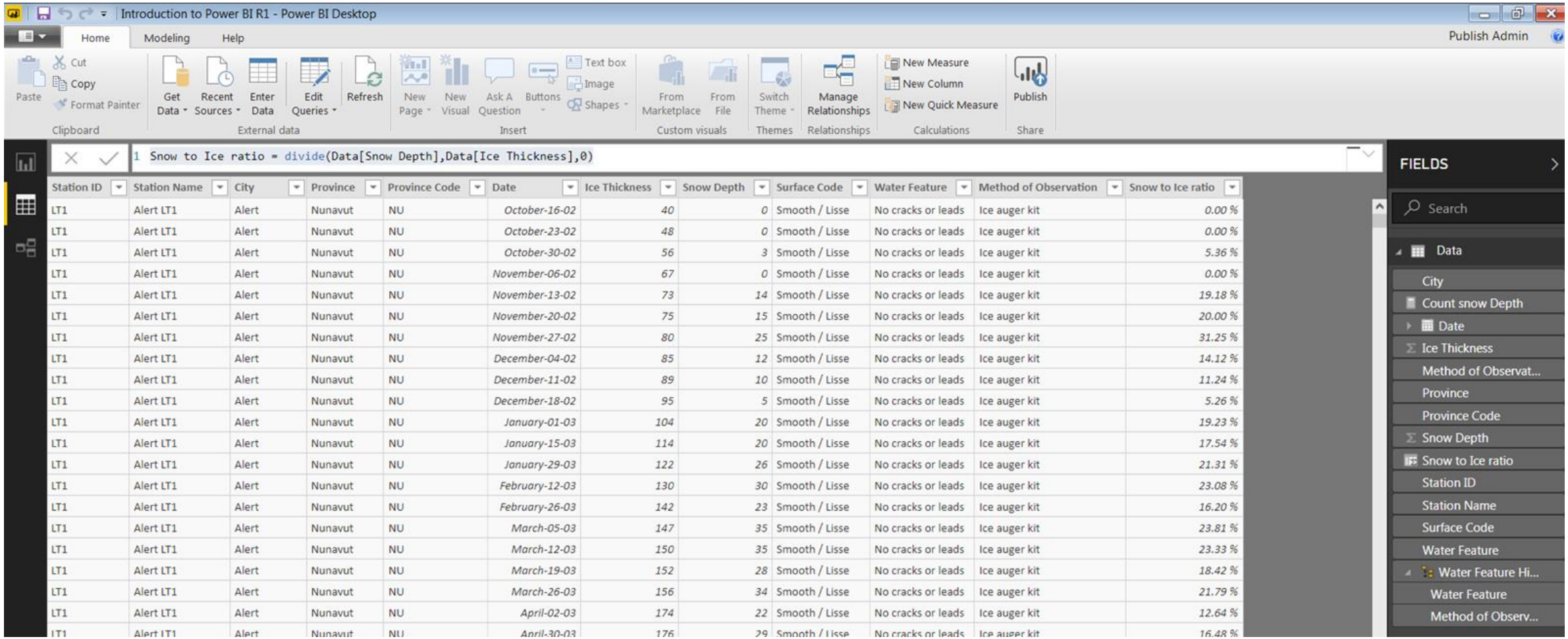
CUSTOM COLUMNS

Let's consider the **ratio between snow depth and ice depth** in the dataset.

That is, let's **divide** snow depth by ice depth: click on "new column" and add in the following DAX code:

```
Snow to Ice ratio = divide(Data[Snow Depth],Data[Ice Thickness],0)
```

Follow along to modify the number of significant digits and to change the value type from number to percentage.



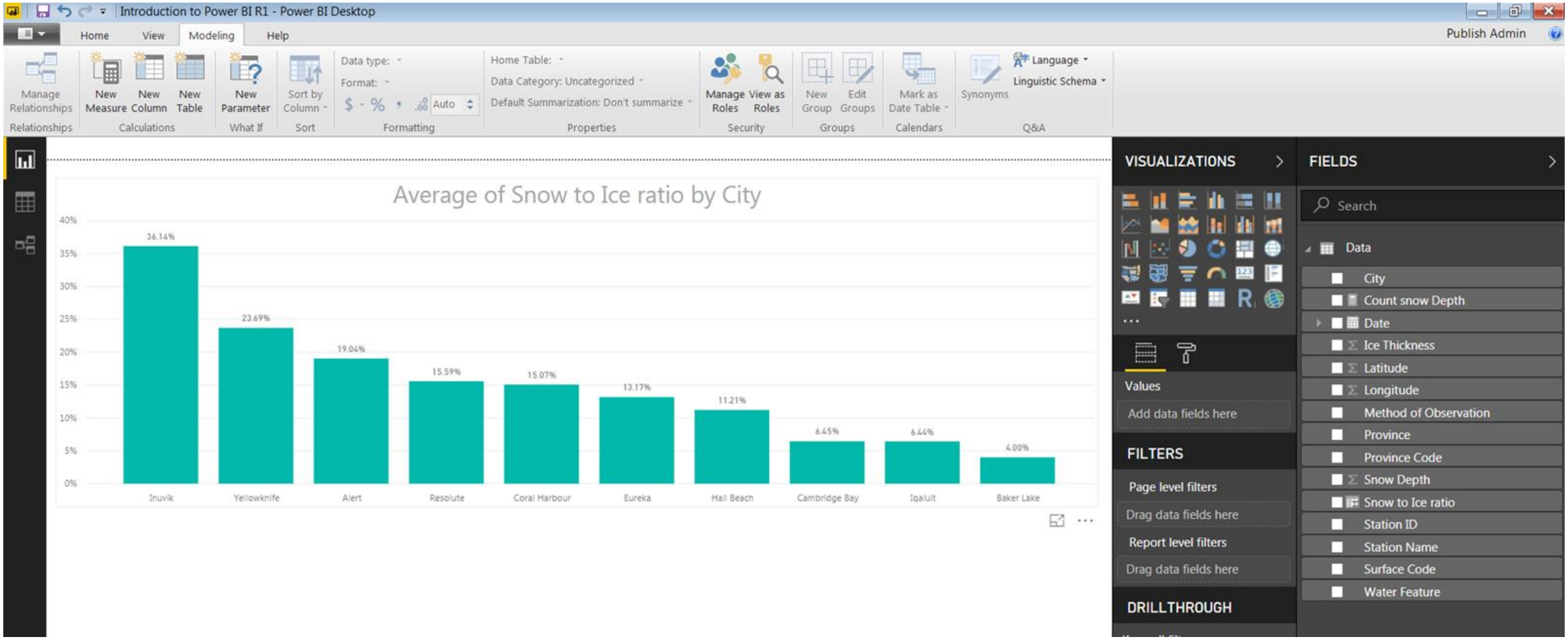
Station ID	Station Name	City	Province	Province Code	Date	Ice Thickness	Snow Depth	Surface Code	Water Feature	Method of Observation	Snow to Ice ratio
LT1	Alert LT1	Alert	Nunavut	NU	October-16-02	40	0	Smooth / Lisse	No cracks or leads	Ice auger kit	0.00 %
LT1	Alert LT1	Alert	Nunavut	NU	October-23-02	48	0	Smooth / Lisse	No cracks or leads	Ice auger kit	0.00 %
LT1	Alert LT1	Alert	Nunavut	NU	October-30-02	56	3	Smooth / Lisse	No cracks or leads	Ice auger kit	5.36 %
LT1	Alert LT1	Alert	Nunavut	NU	November-06-02	67	0	Smooth / Lisse	No cracks or leads	Ice auger kit	0.00 %
LT1	Alert LT1	Alert	Nunavut	NU	November-13-02	73	14	Smooth / Lisse	No cracks or leads	Ice auger kit	19.18 %
LT1	Alert LT1	Alert	Nunavut	NU	November-20-02	75	15	Smooth / Lisse	No cracks or leads	Ice auger kit	20.00 %
LT1	Alert LT1	Alert	Nunavut	NU	November-27-02	80	25	Smooth / Lisse	No cracks or leads	Ice auger kit	31.25 %
LT1	Alert LT1	Alert	Nunavut	NU	December-04-02	85	12	Smooth / Lisse	No cracks or leads	Ice auger kit	14.12 %
LT1	Alert LT1	Alert	Nunavut	NU	December-11-02	89	10	Smooth / Lisse	No cracks or leads	Ice auger kit	11.24 %
LT1	Alert LT1	Alert	Nunavut	NU	December-18-02	95	5	Smooth / Lisse	No cracks or leads	Ice auger kit	5.26 %
LT1	Alert LT1	Alert	Nunavut	NU	January-01-03	104	20	Smooth / Lisse	No cracks or leads	Ice auger kit	19.23 %
LT1	Alert LT1	Alert	Nunavut	NU	January-15-03	114	20	Smooth / Lisse	No cracks or leads	Ice auger kit	17.54 %
LT1	Alert LT1	Alert	Nunavut	NU	January-29-03	122	26	Smooth / Lisse	No cracks or leads	Ice auger kit	21.31 %
LT1	Alert LT1	Alert	Nunavut	NU	February-12-03	130	30	Smooth / Lisse	No cracks or leads	Ice auger kit	23.08 %
LT1	Alert LT1	Alert	Nunavut	NU	February-26-03	142	23	Smooth / Lisse	No cracks or leads	Ice auger kit	16.20 %
LT1	Alert LT1	Alert	Nunavut	NU	March-05-03	147	35	Smooth / Lisse	No cracks or leads	Ice auger kit	23.81 %
LT1	Alert LT1	Alert	Nunavut	NU	March-12-03	150	35	Smooth / Lisse	No cracks or leads	Ice auger kit	23.33 %
LT1	Alert LT1	Alert	Nunavut	NU	March-19-03	152	28	Smooth / Lisse	No cracks or leads	Ice auger kit	18.42 %
LT1	Alert LT1	Alert	Nunavut	NU	March-26-03	156	34	Smooth / Lisse	No cracks or leads	Ice auger kit	21.79 %
LT1	Alert LT1	Alert	Nunavut	NU	April-02-03	174	22	Smooth / Lisse	No cracks or leads	Ice auger kit	12.64 %
LT1	Alert LT1	Alert	Nunavut	NU	April-30-03	176	29	Smooth / Lisse	No cracks or leads	Ice auger kit	16.48 %

CHARTS

How do we incorporate this new measure and this new column into a chart?

- click on the “Visualization” tab
- click on “Stacked Column Chart”
- drag “City” onto the axis
- drag “Snow to Ice Ratio” onto the values, click on the arrow to change from “Sum” to “Average”

Once you get to know the formatting options, play around and see what you can produce – how many new charts can you add to the dashboard?


Introduction to Power BI R1 - Power BI Desktop
Home
View
Modeling
Help
Publish Admin
Manage Relationships
New Measure
New Column
New Table
New Parameter
Sort by Column
Data type:
Format:
Auto
Home Table:
Data Category: Uncategorized
Default Summarization: Don't summarize
Manage Roles
View as Roles
New Group
Edit Groups
Mark as Date Table
Synonyms
Language
Linguistic Schema
Relationships
Calculations
What If
Sort
Formatting
Properties
Security
Groups
Calendars
Q&A
Average of Snow to Ice ratio by City
40%
35%
30%
25%
20%
15%
10%
5%
0%
36.14%
23.69%
19.04%
15.59%
15.07%
13.17%
11.21%
6.45%
6.44%
4.00%
Inuvik
Yellowknife
Alert
Resolute
Coral Harbour
Eureka
Hall Beach
Cambridge Bay
Iqaluit
Baker Lake
VISUALIZATIONS
Values
Add data fields here
FILTERS
Page level filters
Drag data fields here
Report level filters
Drag data fields here
DRILLTHROUGH
FIELDS
Search
Data
City
Count snow Depth
Date
Ice Thickness
Latitude
Longitude
Method of Observation
Province
Province Code
Snow Depth
Snow to Ice ratio
Station ID
Station Name
Surface Code
Water Feature

MAKING THINGS DYNAMIC

PBI-1: AN OVERVIEW OF POWER BI

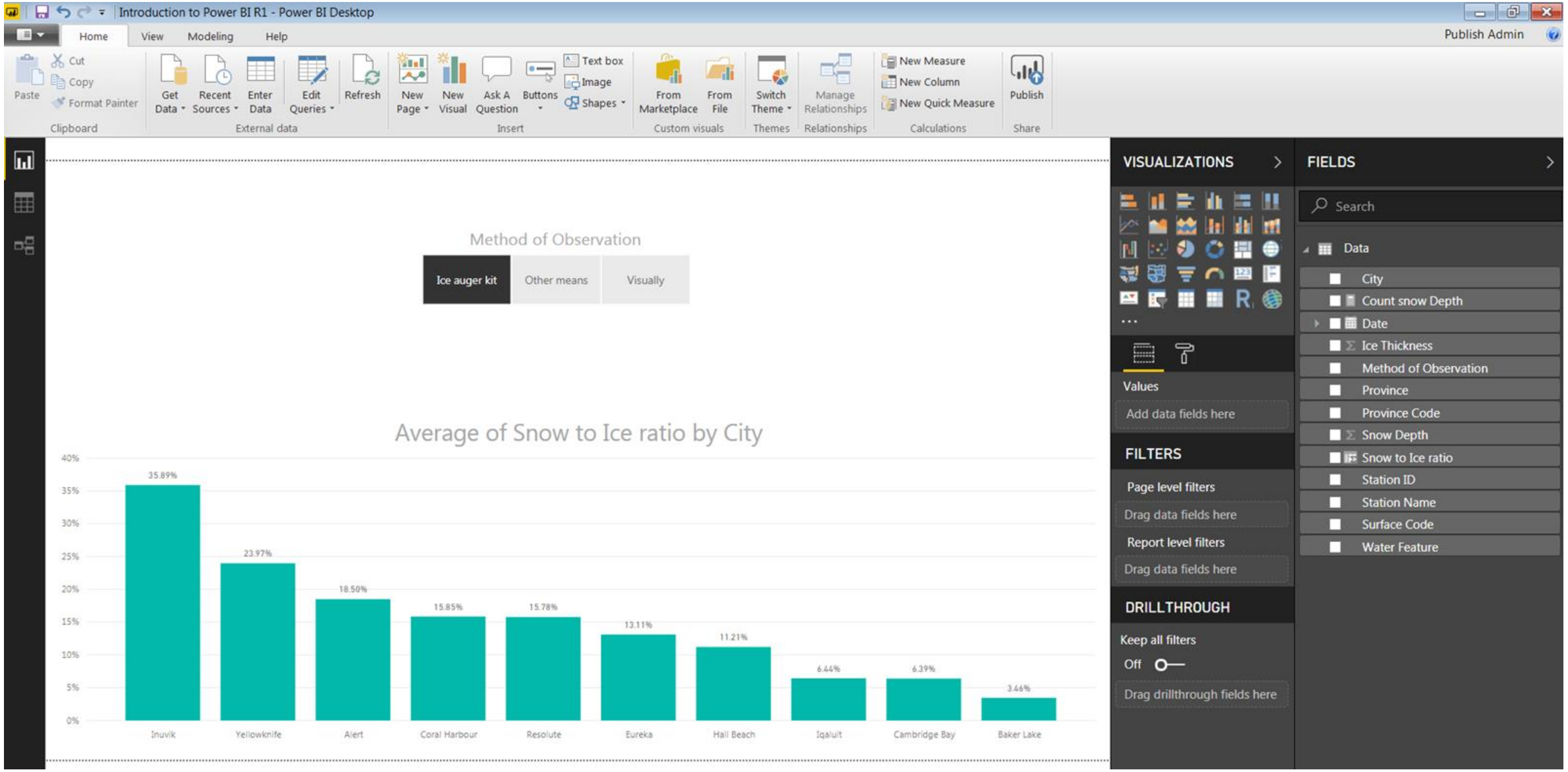
BASIC INTERACTIVE FILTERING

The true power of Power BI is found in the ability to use **dynamic filters**.

The simplest dynamic filter is the **“slicer”**; charts can act as slicers as well (default).

Example:

- click on the “Slicer” button
- drag in “Method of Observation” over the field space
- change the format as you see fit (see options)
- click on the slicer and see the data change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Method of Observation
Ice auger kit
Other means
Visually
Average of Snow to Ice ratio by City
40%
35%
30%
25%
20%
15%
10%
5%
0%
35.89%
23.97%
18.50%
15.85%
15.78%
13.11%
11.21%
6.44%
6.39%
3.46%
Inuvik
Yellowknife
Alert
Coral Harbour
Resolute
Eureka
Hall Beach
Iqaluit
Cambridge Bay
Baker Lake
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Drag drillthrough fields here
FIELDS
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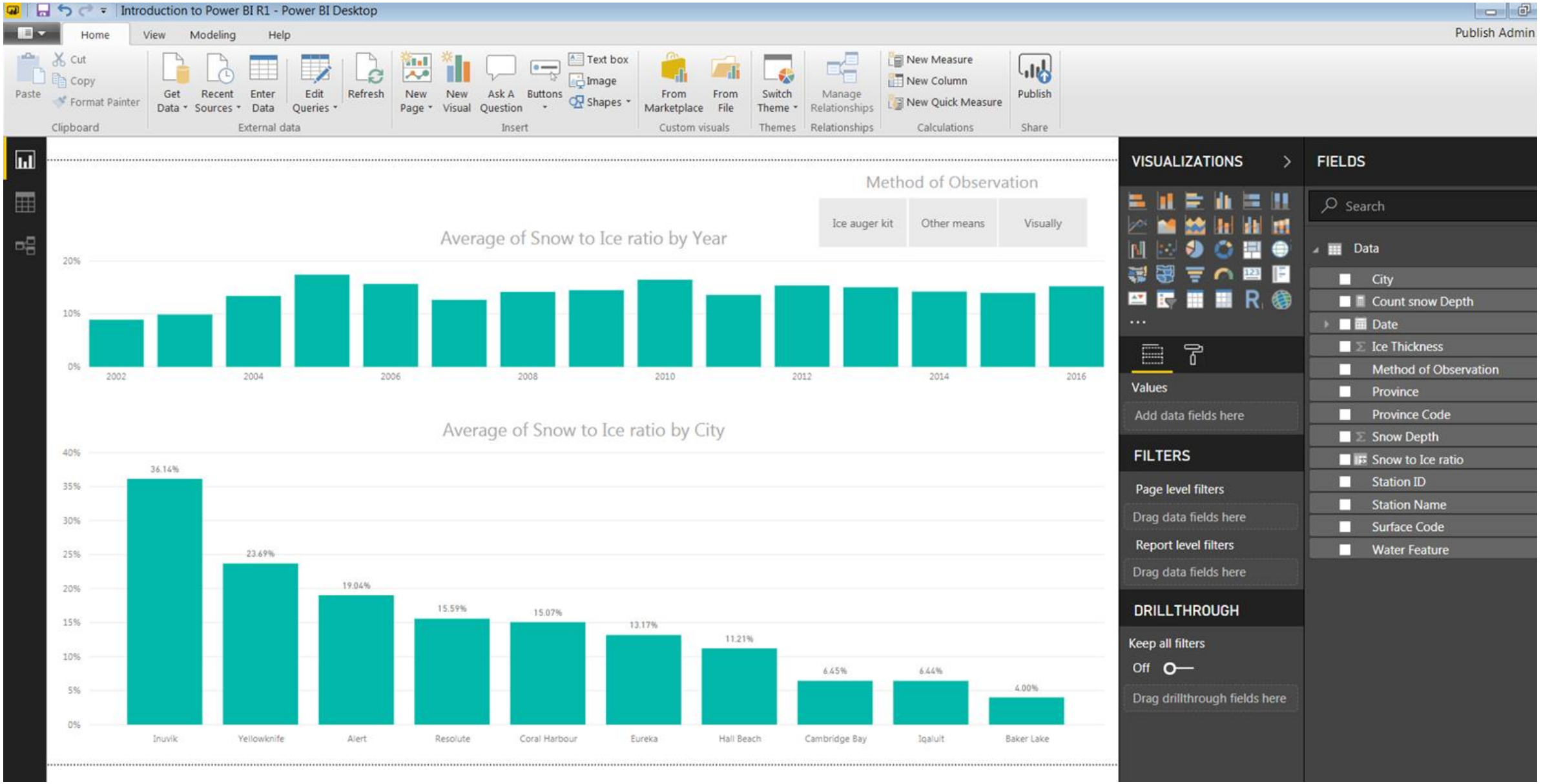
Data
City
Count snow Depth
Date
Ice Thickness
Method of Observation
Province
Province Code
Snow Depth
Snow to Ice ratio
Station ID
Station Name
Surface Code
Water Feature

BASIC INTERACTIVE FILTERING

Let's do some more filtering, but this time using another chart:

- move your first slicer out of the way
- add another chart into the report
- click on column chart
- drag "Date" onto the axis
- drag "Ration of Snow to Ice" into the values and set to average
- change the format as desired
- click on either graph and/or the slicer and see how things change!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Relationships
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New Quick Measure
Calculations
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Share
Method of Observation
Ice auger kit
Other means
Visually
Average of Snow to Ice ratio by Year
20%
10%
0%
2002
2004
2006
2008
2010
2012
2014
2016
Average of Snow to Ice ratio by City
40%
35%
30%
25%
20%
15%
10%
5%
0%
36.14%
23.69%
19.04%
15.59%
15.07%
13.17%
11.21%
6.45%
6.44%
4.00%
Inuvik
Yellowknife
Alert
Resolute
Coral Harbour
Eureka
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DRILLTHROUGH
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Drag drillthrough fields here
FIELDS
Search
Data
City
Count snow Depth
Date
Ice Thickness
Method of Observation
Province
Province Code
Snow Depth
Snow to Ice ratio
Station ID
Station Name
Surface Code
Water Feature

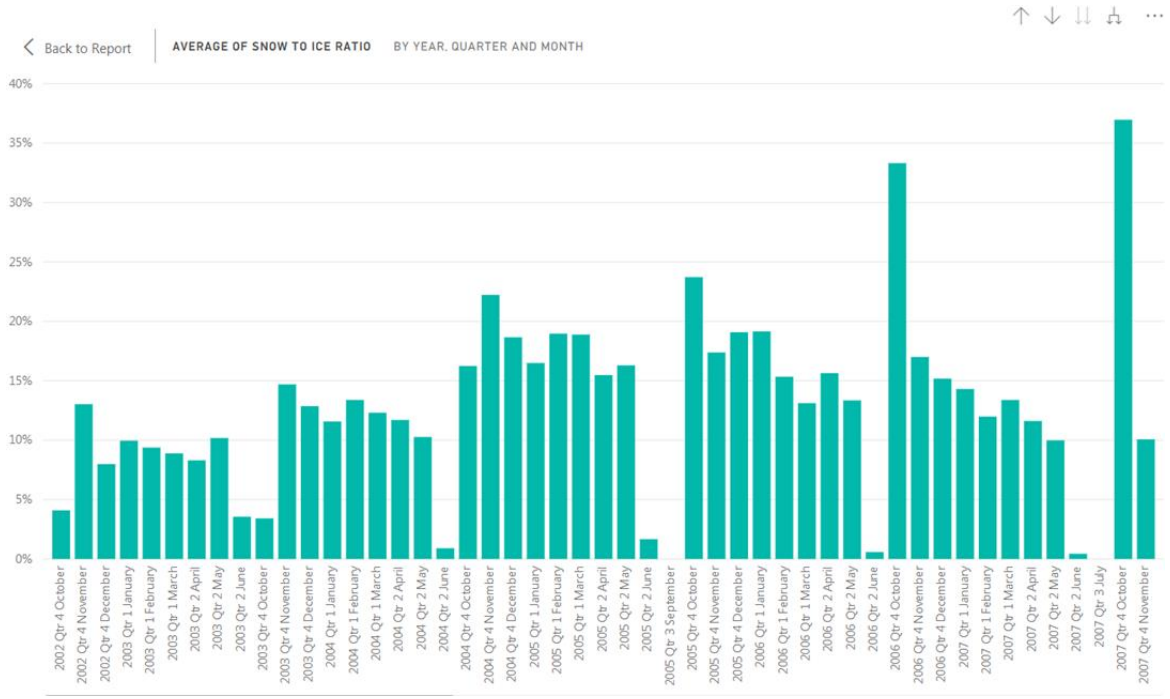
BASIC HIERARCHIES OF DATA

Hierarchies provide a way to order data levels. They let us **summarize** the data in different ways, with GREAT flexibility.

Power BI automatically creates a Date hierarchy, for instance:

- Year > Quarter > Month > Week > Day

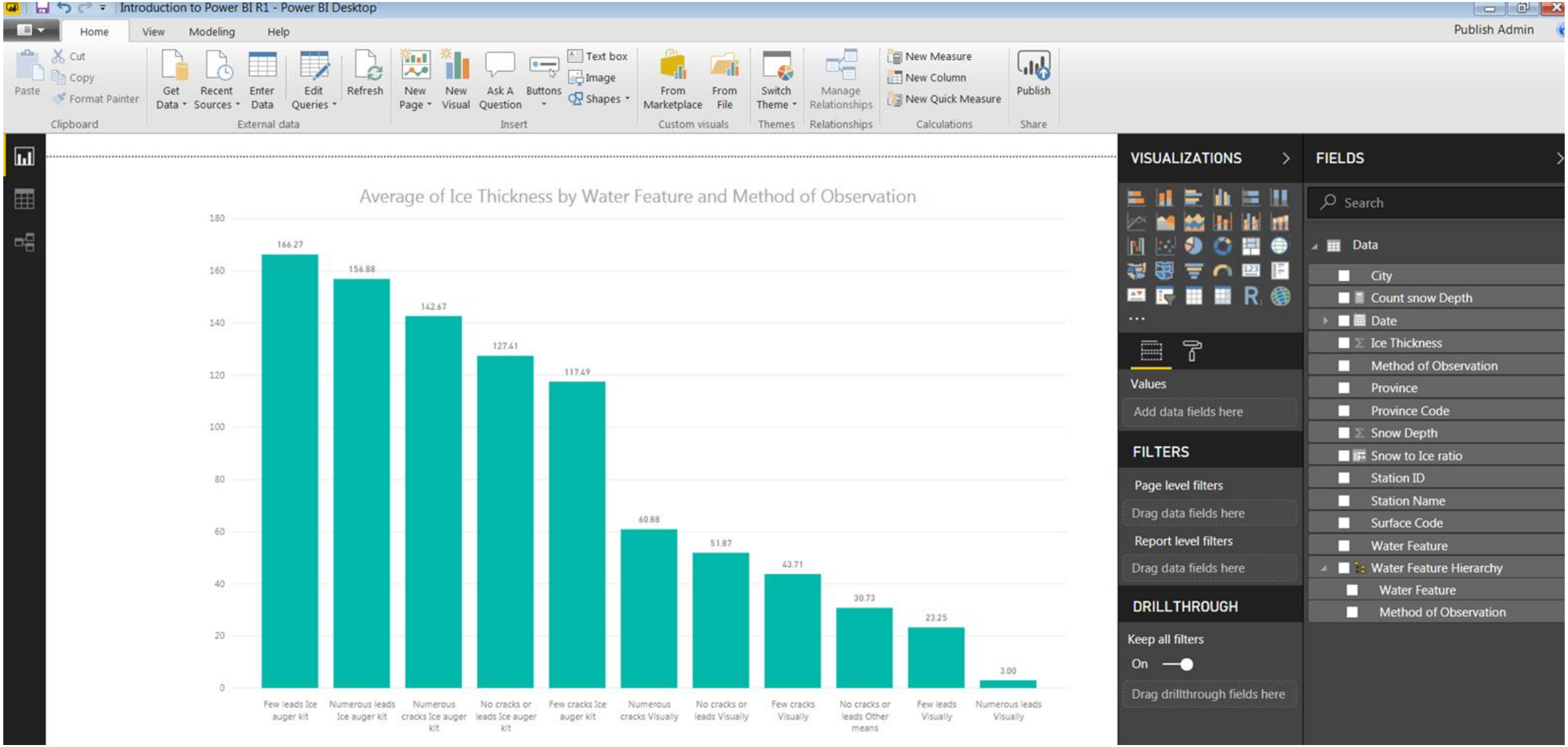
The hierarchies can be navigated up and down in the date chart we created.



BASIC HIERARCHIES OF DATA

Power BI makes it easy to create custom Data hierarchies:

- in the Fields area, drag “Method of Observation” over “Water Feature”
- this will create a new hierarchy called “Water Feature Hierarchy”
- create a new chart with “Water Feature Hierarchy” as the axis and “Ice Thickness” (set to average) as the value
- play around with the hierarchy controls in the chart and see what happens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Average of Ice Thickness by Water Feature and Method of Observation
180
160
140
120
100
80
60
40
20
0
166.27
156.88
142.67
127.41
117.49
60.88
51.87
43.71
30.73
23.25
3.00
Few leads Ice auger kit
Numerous leads Ice auger kit
Numerous cracks Ice auger kit
No cracks or leads Ice auger kit
Few cracks Ice auger kit
Numerous cracks Visually
No cracks or leads Visually
Few cracks Visually
No cracks or leads Other means
Few leads Visually
Numerous leads Visually
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Drag drillthrough fields here
FIELDS
Search
Data
City
Count snow Depth
Date
Ice Thickness
Method of Observation
Province
Province Code
Snow Depth
Snow to Ice ratio
Station ID
Station Name
Surface Code
Water Feature
Water Feature Hierarchy
Water Feature
Method of Observation

DASHBOARD AND REPORT LAYOUT

We are not going into the same detail as the “Data Visualization courses that DAL offers” course, so please refer to those notes re: layout

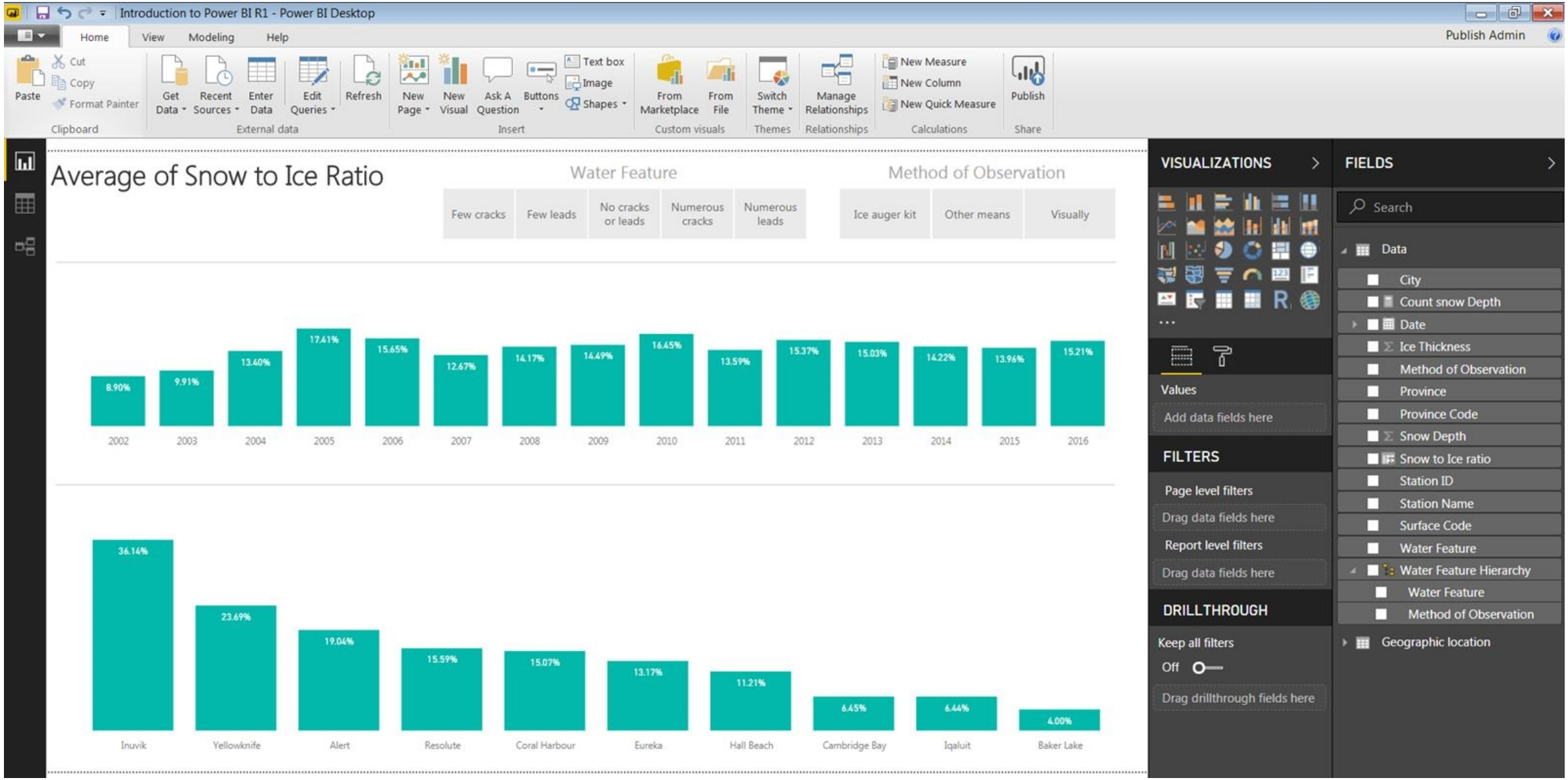
Things to remember:

- to select multiple items, use “Ctrl” left click, NOT “Shift” left click
- use cards in place of text to make dynamic text boxes
- use shapes to create different spaces in which to place charts and text elements

DASHBOARD AND REPORT LAYOUT

Things to remember (continued):

- clicking on an item makes the “Visual Tools” ribbon appears, in which we can find
  - alignment
  - push item forwards/back
  - distribute vertically/horizontally
  - edit how filters and slicers effect each element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Relationships
New Measure
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New Quick Measure
Calculations
Publish
Share
Average of Snow to Ice Ratio
Water Feature
Few cracks
Few leads
No cracks or leads
Numerous cracks
Numerous leads
Method of Observation
Ice auger kit
Other means
Visually
8.90%
9.91%
13.40%
17.41%
15.65%
12.67%
14.17%
14.49%
16.45%
13.59%
15.37%
15.03%
14.22%
13.96%
15.21%
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
36.14%
23.69%
19.04%
15.59%
15.07%
13.17%
11.21%
6.45%
6.44%
4.00%
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Province Code
Snow Depth
Snow to Ice ratio
Station ID
Station Name
Surface Code
Water Feature
Water Feature Hierarchy
Water Feature
Method of Observation
Geographic location

DASHBOARD AND REPORT LAYOUT

We are going to spend the rest of the session playing around with the elements that you have created.

Don’t hesitate to ask for help.

Try the following:

- create a map using latitude and longitude
- create some new measures and columns of data
- map these new elements to create a story
- play around with formatting to pull everything together

Questions?