Flux Data Server User Tutorial

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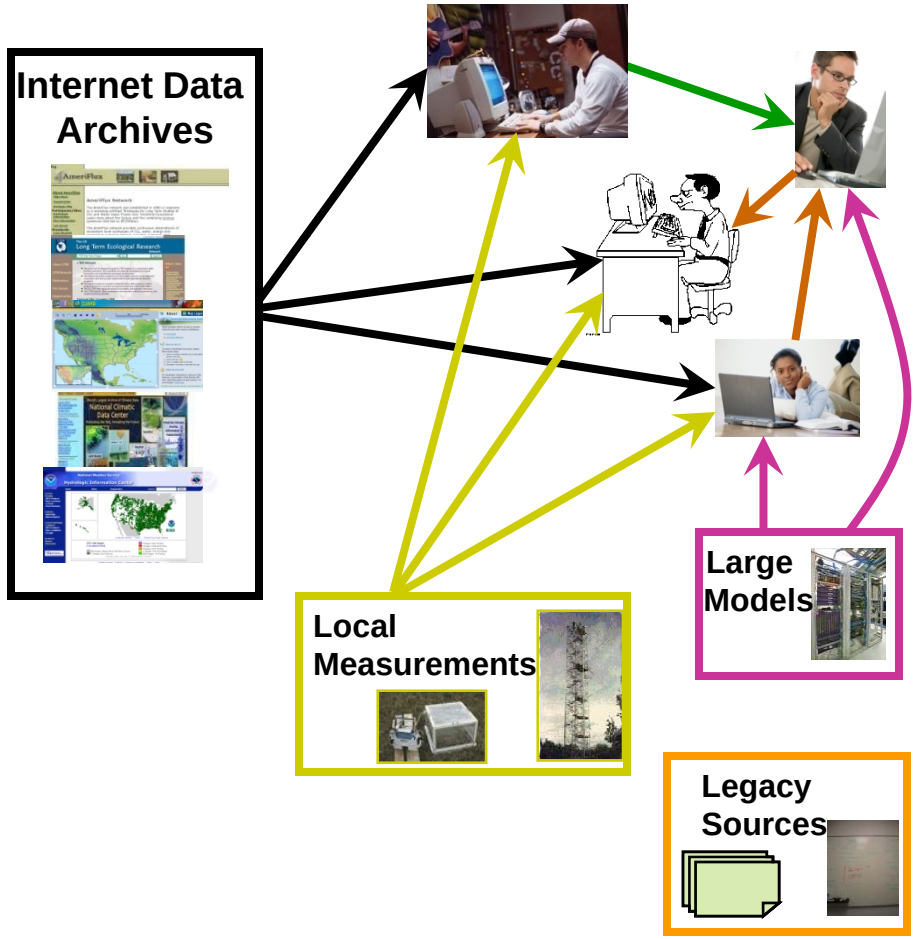
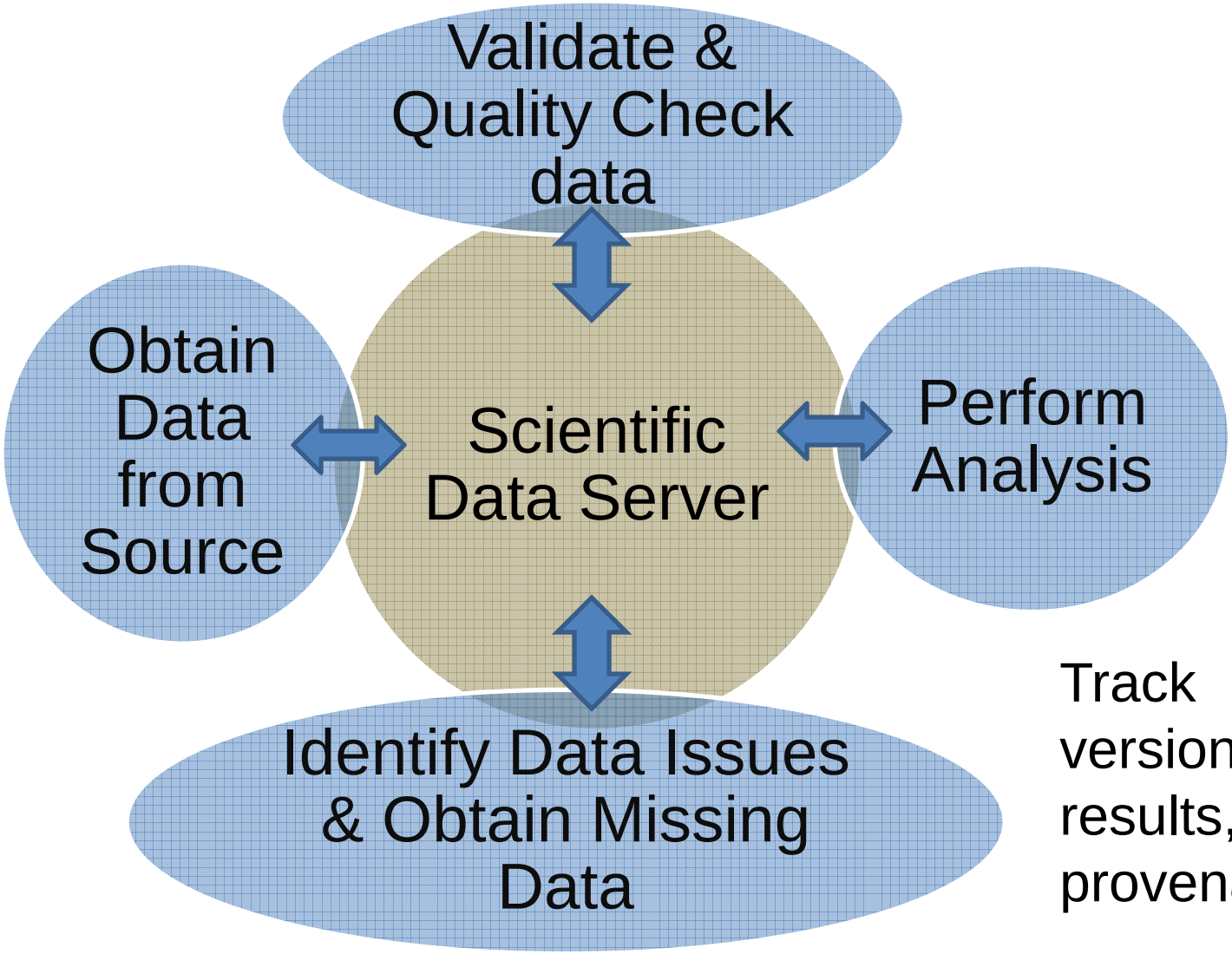
Typical Data Storage Today

- Data retrieved by each investigator individually
- Data corrections and updates applied individually
- Data are often scattered, across a wide array of locations
  - Provenance is often not tracked
  - “Everybody knows” yet no one is sure

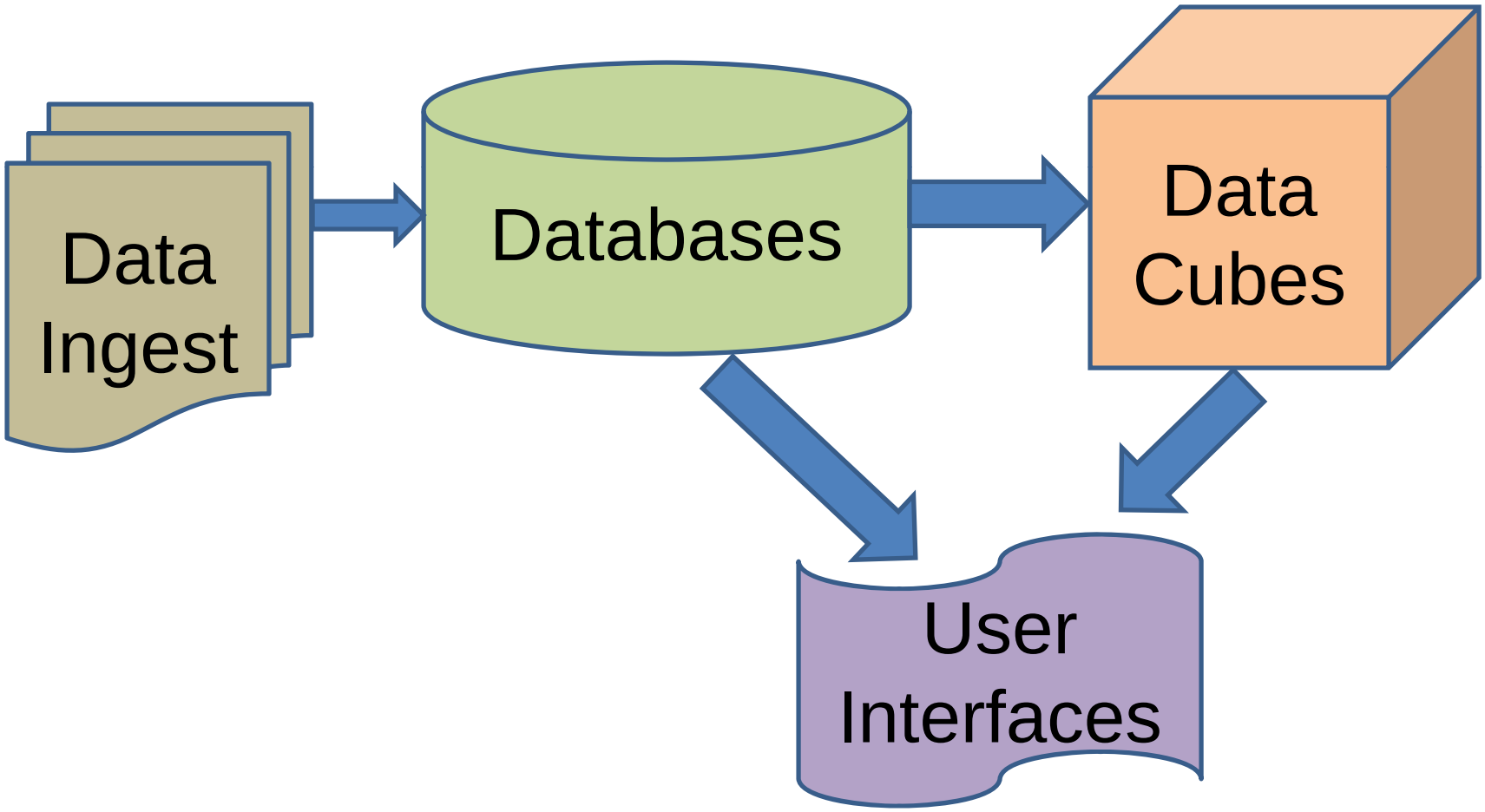


Target Data Analysis Flow



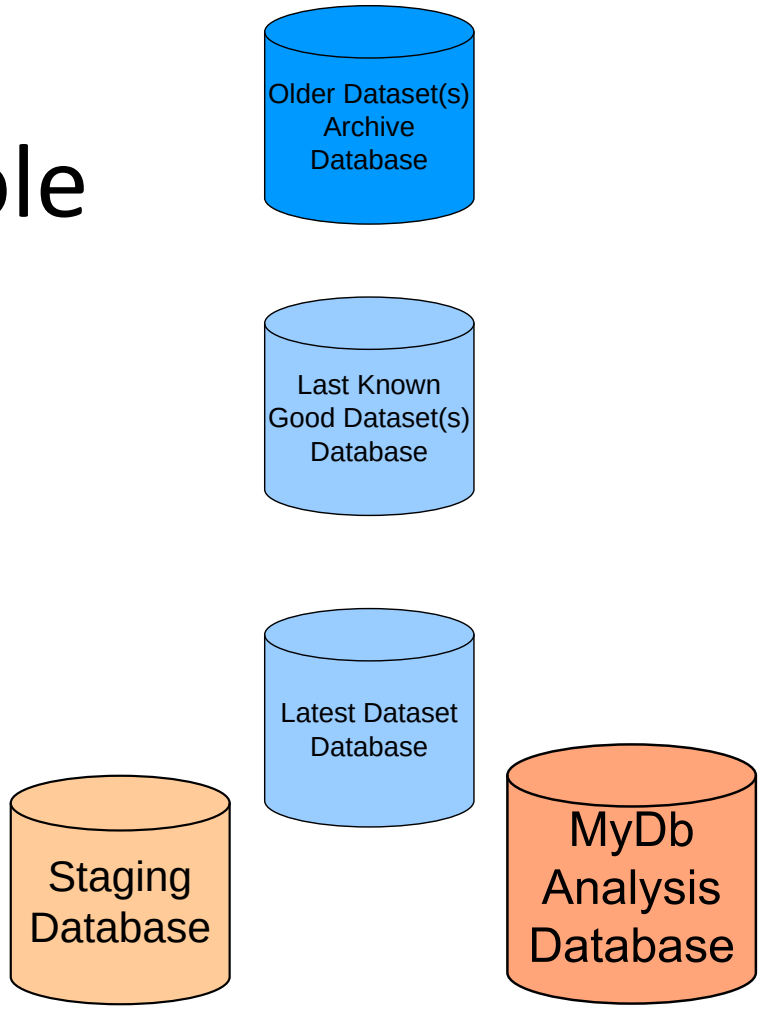
Track versions, results, and provenance

Scientific Data Server - Overview



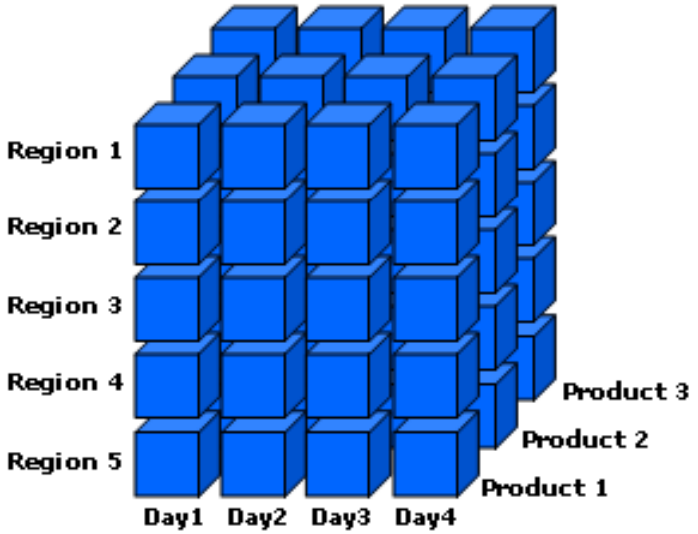
Database Role

- All descriptive metadata and data held in relational databases
  - Metadata is important too!
- Data versioning enables tracking of changes
- Data reorganization easy
- Allows complex questions to be posed
- Data may be exported to flat file, copied to a private MyDb database, directly accessed programmatically, or ?

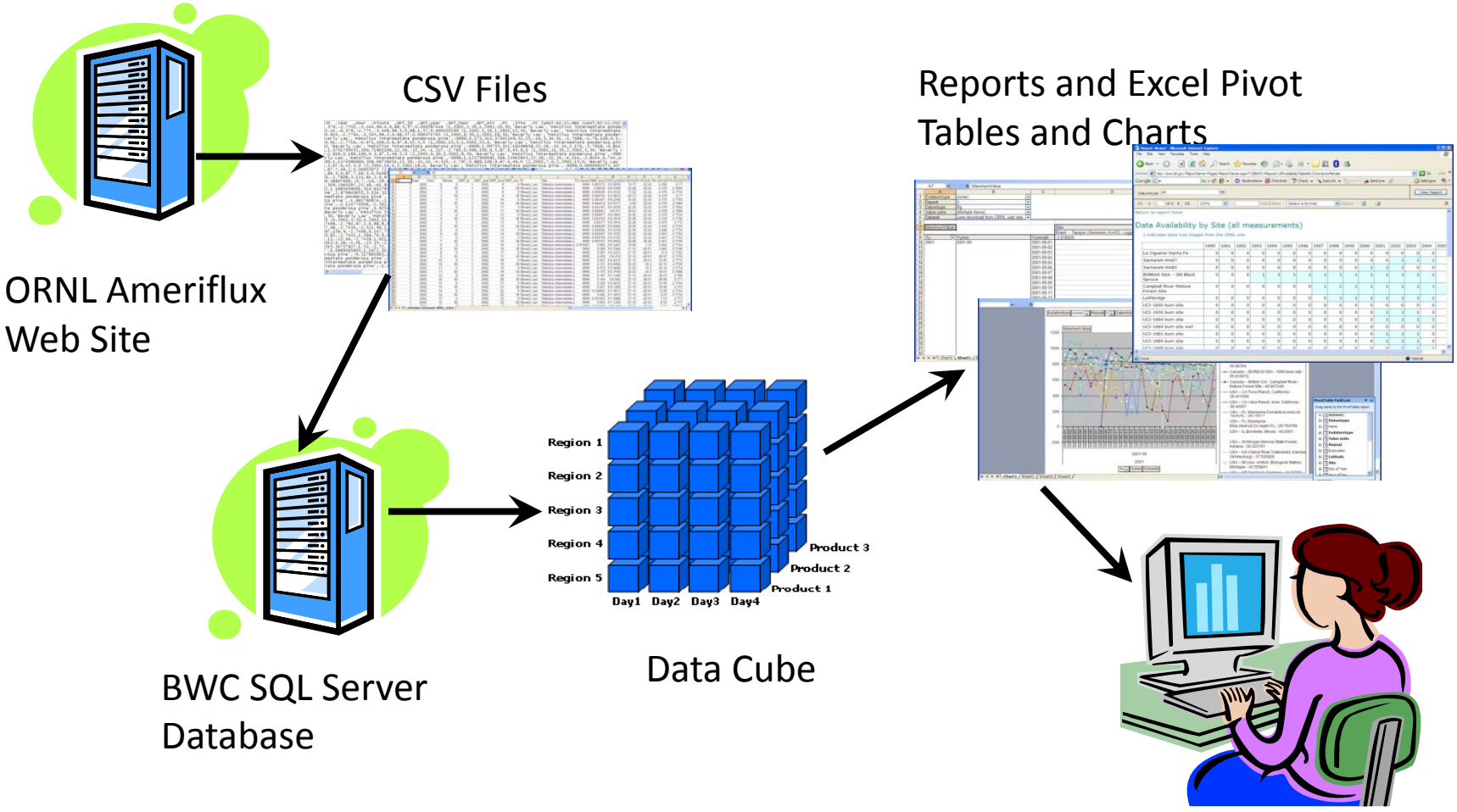


Data Cubes

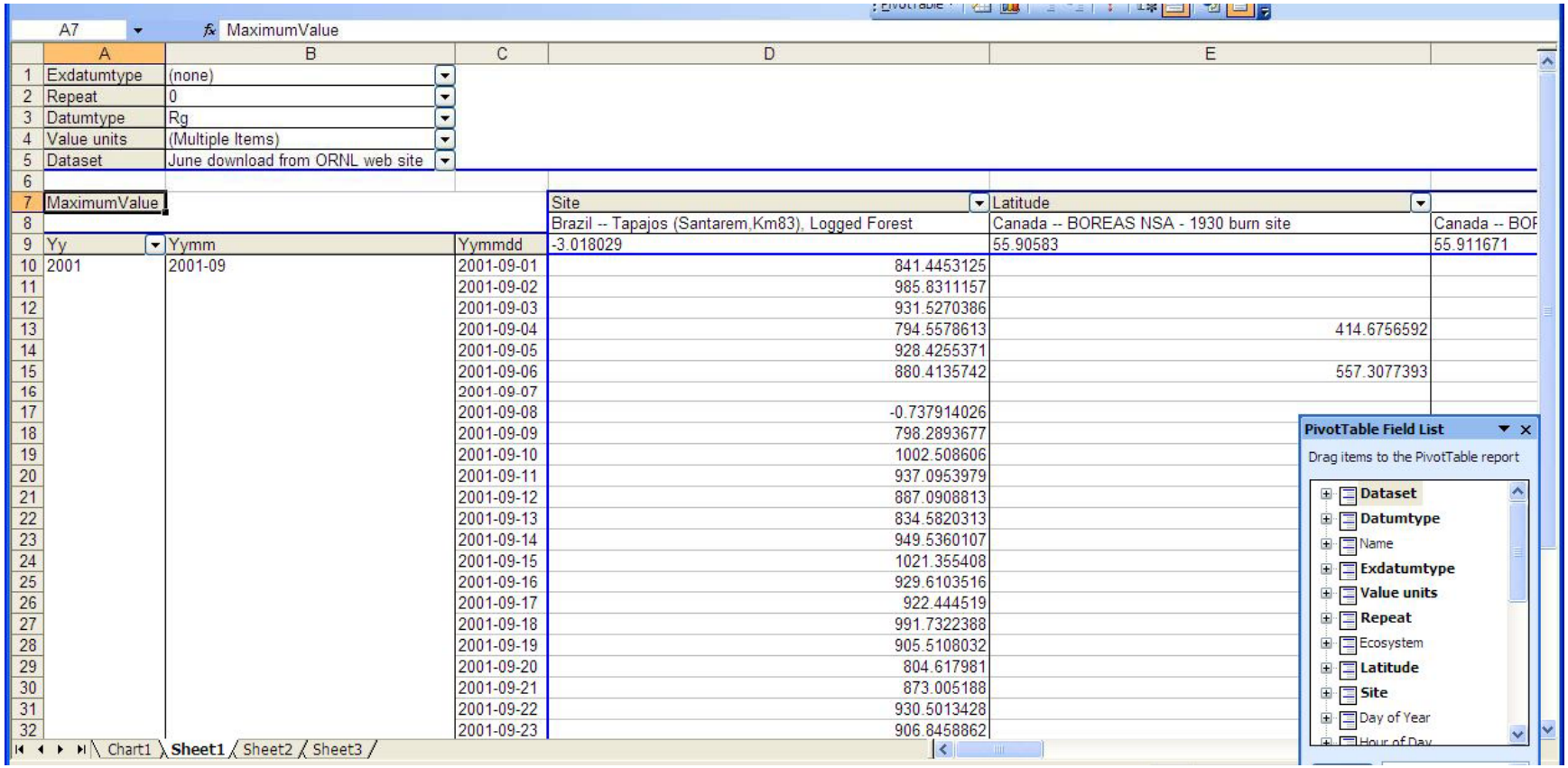
- A data cube is a database specifically designed for data mining
  - Simple *aggregations* (sum, min, or max) can be pre-computed for speed
  - Additional calculations can be computed dynamically or pre-computed (e.g. daily calc, par day)
  - Both operate along *dimensions* such as time, site, or datumtype
  - Constructed from a relational database
- Client tool integration is evolving
  - Excel PivotTables allow simple data viewing
  - More powerful analysis and plotting using Matlab and statistics software



Overview of Data Server Flow



Pivot Tables



A7 MaximumValue

	A	B	C	D	E	
1	Exdatumtype	(none)				
2	Repeat	0				
3	Datumtype	Rg				
4	Value units	(Multiple Items)				
5	Dataset	June download from ORNL web site				
6						
7	MaximumValue			Site	Latitude	
8				Brazil -- Tapajos (Santarem,Km83), Logged Forest	Canada -- BOREAS NSA - 1930 burn site	Canada -- BOF
9	Yy	Ymm	Ymmdd	-3.018029	55.90583	55.911671
10	2001	2001-09	2001-09-01	841.4453125		
11			2001-09-02	985.8311157		
12			2001-09-03	931.5270386		
13			2001-09-04	794.5578613	414.6756592	
14			2001-09-05	928.4255371		
15			2001-09-06	880.4135742	557.3077393	
16			2001-09-07			
17			2001-09-08	-0.737914026		
18			2001-09-09	798.2893677		
19			2001-09-10	1002.508606		
20			2001-09-11	937.0953979		
21			2001-09-12	887.0908813		
22			2001-09-13	834.5820313		
23			2001-09-14	949.5360107		
24			2001-09-15	1021.355408		
25			2001-09-16	929.6103516		
26			2001-09-17	922.444519		
27			2001-09-18	991.7322388		
28			2001-09-19	905.5108032		
29			2001-09-20	804.617981		
30			2001-09-21	873.005188		
31			2001-09-22	930.5013428		
32			2001-09-23	906.8458862		

Chart1 | Sheet1 | Sheet2 | Sheet3

PivotTable Field List

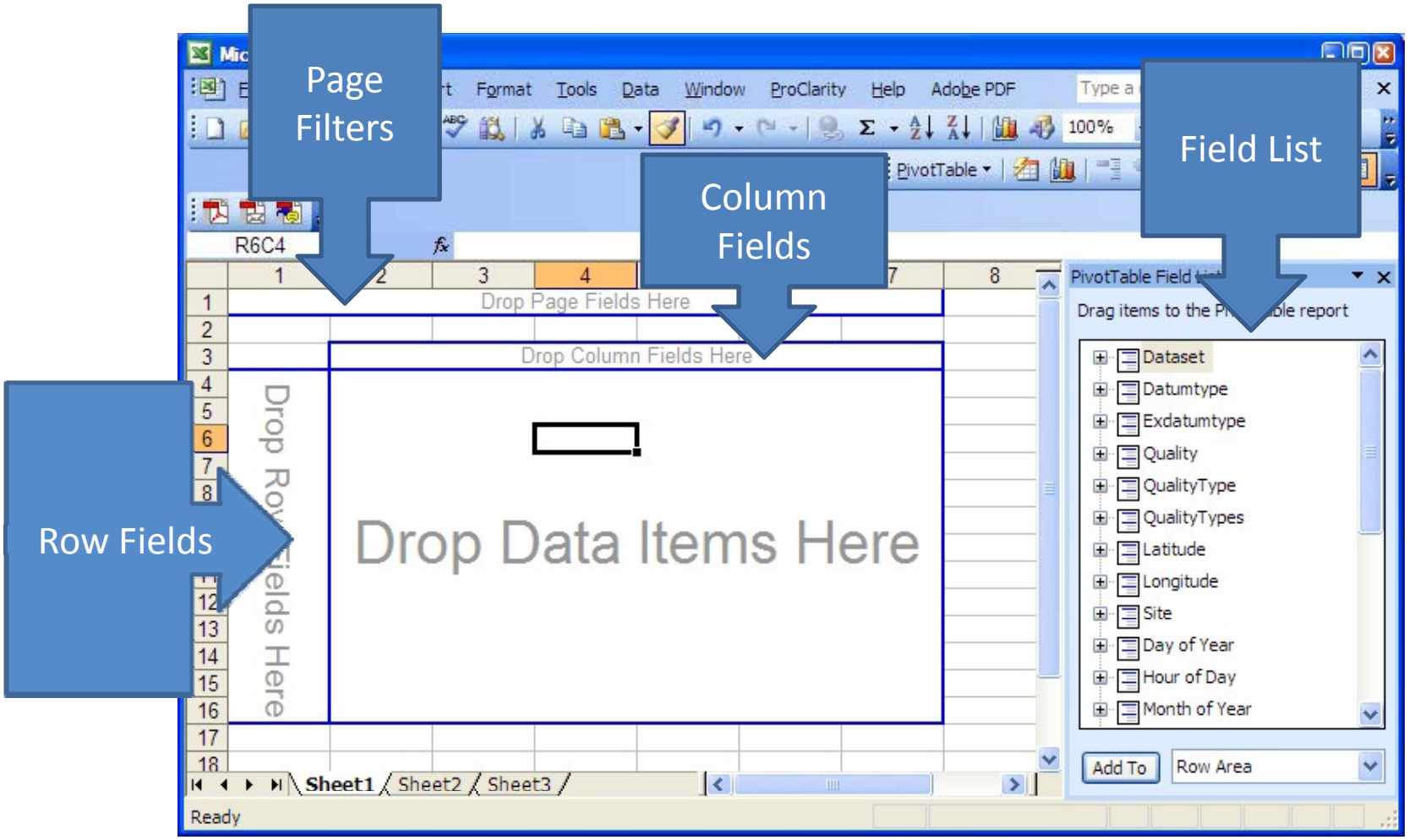
Drag items to the PivotTable report

- Dataset
- Datumtype
- Name
- Exdatumtype
- Value units
- Repeat
- Ecosystem
- Latitude
- Site
- Day of Year
- Hour of Day

Switch to Live demo of Pivot Tables

- Connect up a cube and view data in 2003 and 2007
- Display pivot chart and links to table

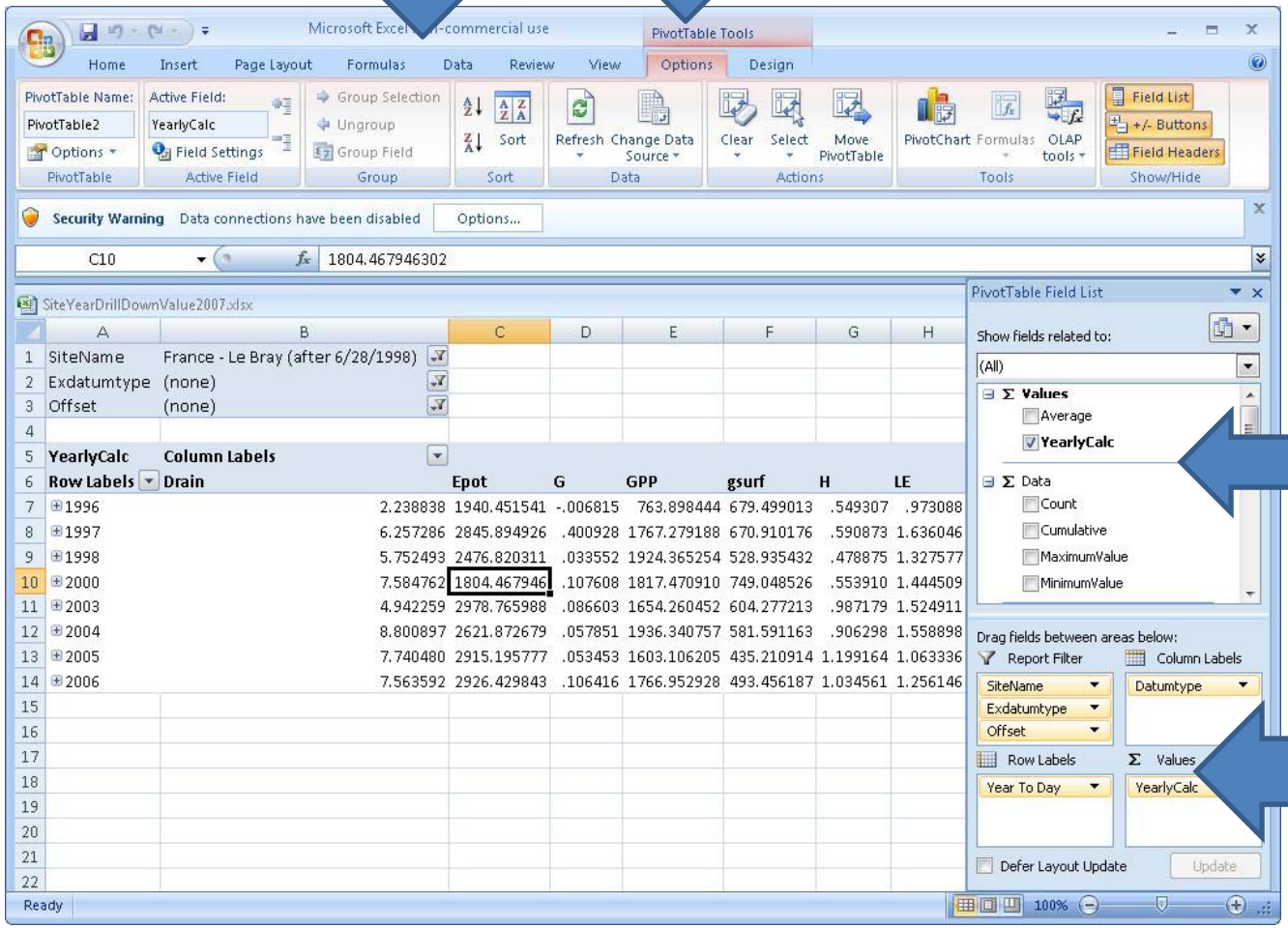
Pivot Table Regions 2003



Pivot Table Regions 2007

Data Connections

Pivot Tools



Pivot Field List and Filtering

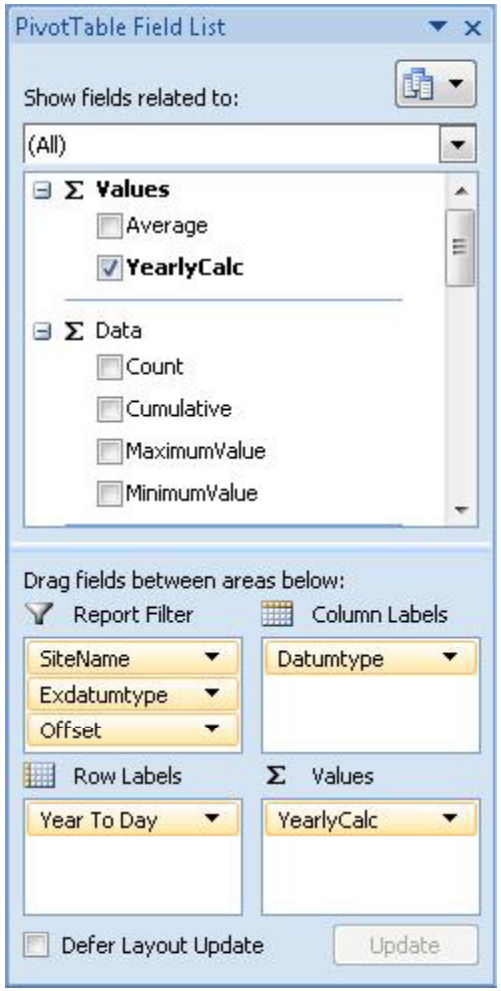
Pivot Layout and Field Optioons

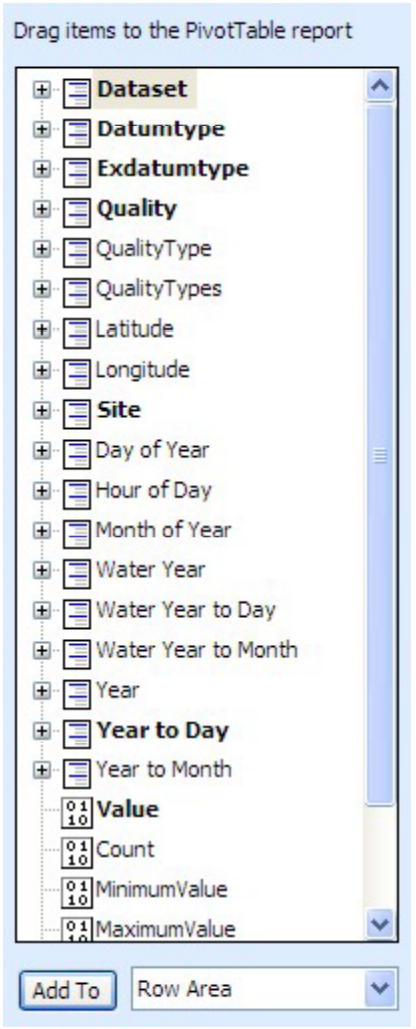
Pivot Table Regions

- Page Filters
  - Applied to all data before it goes into the pivot table
- Columns and rows
  - Layout the table
  - Select all or individual items
- Data
  - Calculated values – average, sum, etc

Pivot Table Field List

- Organizing Dimensions of the Pivot Table





Dimension Hierarchies

- Year to Day
  - Initially displays years
  - Opening a year gives days
  - In contrast – Day of Year is a flat dimension giving days
- Year to Month
  - Initially displays years
  - Opening a year gives months
  - Opening a month gives days
- VegType to Site

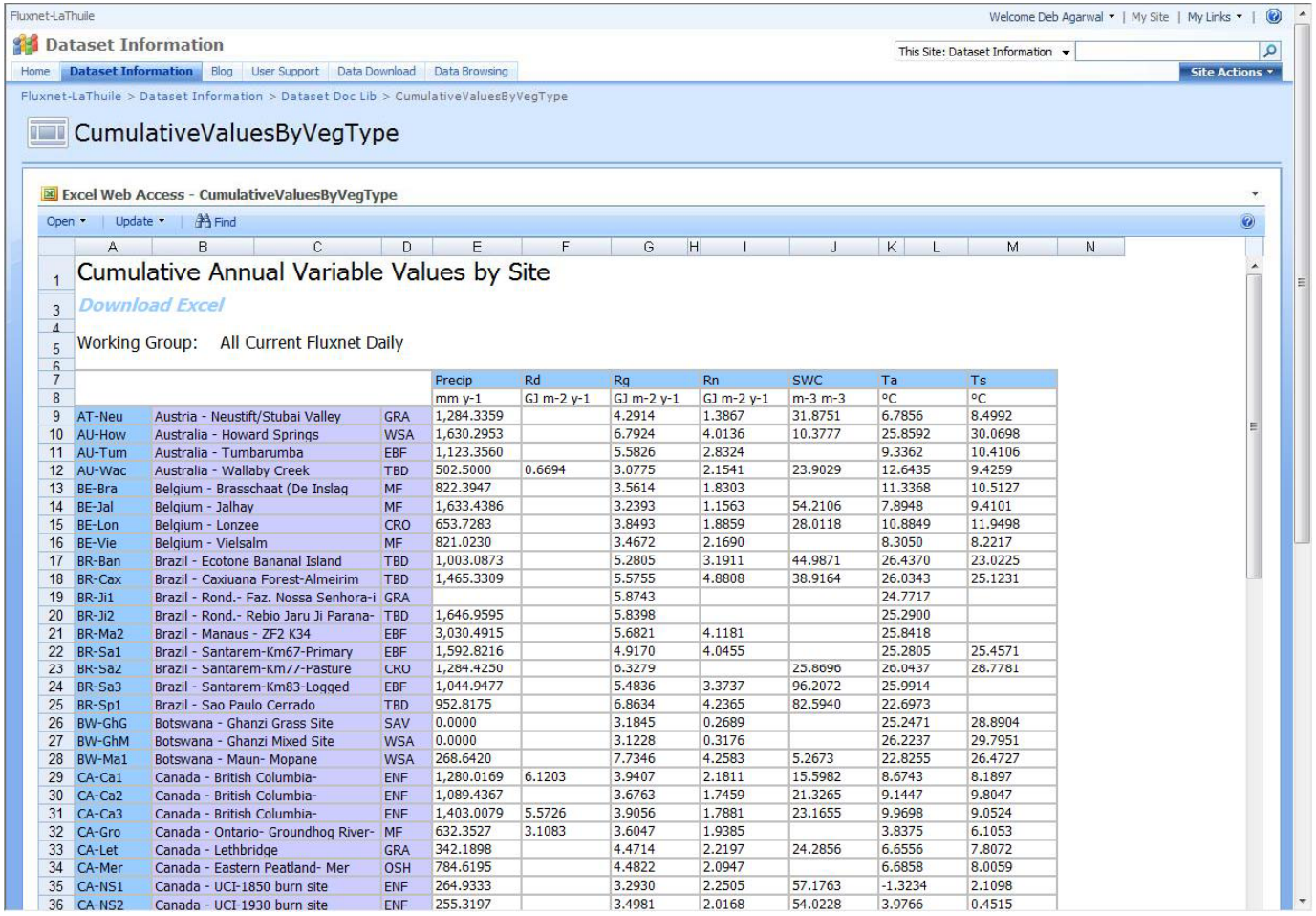
Exdatumtype and Offset

Column heading	Datumtype	Offset	Repeat	Exdatumtype
TA_7_6 (deg C)	TA	7.6	None	None
FC_WPL_H_25 (umol/m2/s)	FC	None	None	_WPL_H_25
TA5_F1	TA	None	5	_F1
RH_FRAC_5_8 (FRACTION)	RH	5.8	None	_FRAC
PAR_ALB (umol/m2/s)	PAR	None	None	_ALB
NEEC_396 (umol/m2/s)	None	396	None	NEEC

Calculated Measures

- Science variables
- Statistics

Data Reports



Fluxnet-LaThuile

Welcome Deb Agarwal | My Site | My Links

Dataset Information

This Site: Dataset Information

Home | Dataset Information | Blog | User Support | Data Download | Data Browsing | Site Actions

Fluxnet-LaThuile > Dataset Information > Dataset Doc Lib > CumulativeValuesByVegType

CumulativeValuesByVegType

Excel Web Access - CumulativeValuesByVegType

Open | Update | Find

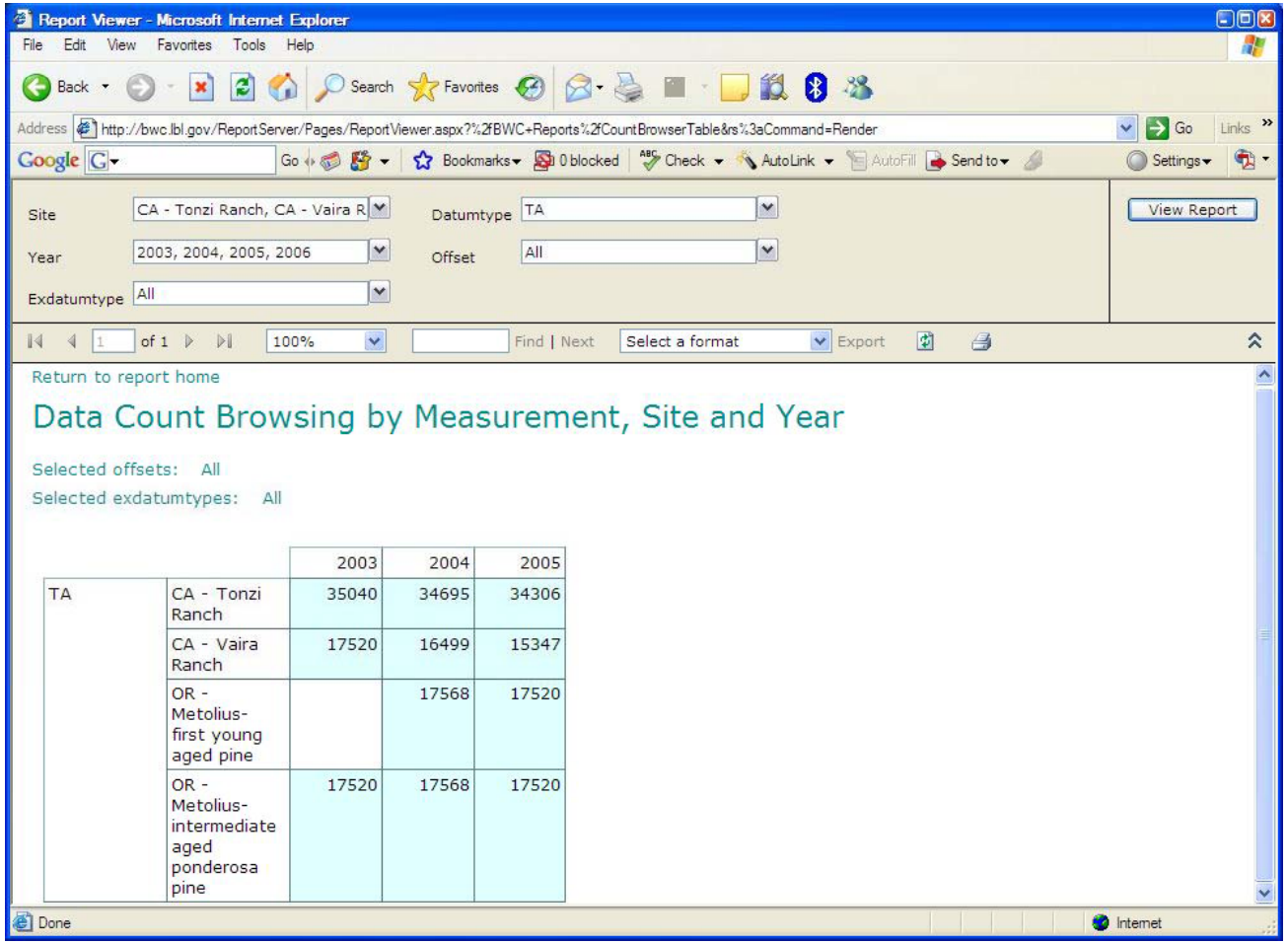
Cumulative Annual Variable Values by Site

Download Excel

Working Group: All Current Fluxnet Daily

				Precip	Rd	Rq	Rn	SWC	Ta	Ts
				mm y-1	GJ m-2 y-1	GJ m-2 y-1	GJ m-2 y-1	m-3 m-3	°C	°C
AT-Neu	Austria - Neustift/Stubai Valley	GRA		1,284.3359		4.2914	1.3867	31.8751	6.7856	8.4992
AU-How	Australia - Howard Springs	WSA		1,630.2953		6.7924	4.0136	10.3777	25.8592	30.0698
AU-Tum	Australia - Tumbarumba	EBF		1,123.3560		5.5826	2.8324		9.3362	10.4106
AU-Wac	Australia - Wallaby Creek	TBD		502.5000	0.6694	3.0775	2.1541	23.9029	12.6435	9.4259
BE-Bra	Belgium - Brasschaat (De Inslag	MF		822.3947		3.5614	1.8303		11.3368	10.5127
BE-Jal	Belgium - Jalhay	MF		1,633.4386		3.2393	1.1563	54.2106	7.8948	9.4101
BE-Lon	Belgium - Lonzee	CRO		653.7283		3.8493	1.8859	28.0118	10.8849	11.9498
BE-Vie	Belgium - Vielsalm	MF		821.0230		3.4672	2.1690		8.3050	8.2217
BR-Ban	Brazil - Ecotone Bananal Island	TBD		1,003.0873		5.2805	3.1911	44.9871	26.4370	23.0225
BR-Cax	Brazil - Caxiuana Forest-Almeirim	TBD		1,465.3309		5.5755	4.8808	38.9164	26.0343	25.1231
BR-Ji1	Brazil - Rond.- Faz. Nossa Senhora-i	GRA				5.8743			24.7717	
BR-Ji2	Brazil - Rond.- Rebio Jaru Ji Parana-	TBD		1,646.9595		5.8398			25.2900	
BR-Ma2	Brazil - Manaus - ZF2 K34	EBF		3,030.4915		5.6821	4.1181		25.8418	
BR-Sa1	Brazil - Santarem-Km67-Primary	EBF		1,592.8216		4.9170	4.0455		25.2805	25.4571
BR-Sa2	Brazil - Santarem-Km77-Pasture	CRO		1,284.4250		6.3279		25.8696	26.0437	28.7781
BR-Sa3	Brazil - Santarem-Km83-Logged	EBF		1,044.9477		5.4836	3.3737	96.2072	25.9914	
BR-Sp1	Brazil - Sao Paulo Cerrado	TBD		952.8175		6.8634	4.2365	82.5940	22.6973	
BW-GhG	Botswana - Ghanzi Grass Site	SAV		0.0000		3.1845	0.2689		25.2471	28.8904
BW-GhM	Botswana - Ghanzi Mixed Site	WSA		0.0000		3.1228	0.3176		26.2237	29.7951
BW-Ma1	Botswana - Maun- Mopane	WSA		268.6420		7.7346	4.2583	5.2673	22.8255	26.4727
CA-Ca1	Canada - British Columbia-	ENF		1,280.0169	6.1203	3.9407	2.1811	15.5982	8.6743	8.1897
CA-Ca2	Canada - British Columbia-	ENF		1,089.4367		3.6763	1.7459	21.3265	9.1447	9.8047
CA-Ca3	Canada - British Columbia-	ENF		1,403.0079	5.5726	3.9056	1.7881	23.1655	9.9698	9.0524
CA-Gro	Canada - Ontario- Groundhog River-	MF		632.3527	3.1083	3.6047	1.9385		3.8375	6.1053
CA-Let	Canada - Lethbridge	GRA		342.1898		4.4714	2.2197	24.2856	6.6556	7.8072
CA-Mer	Canada - Eastern Peatland- Mer	OSH		784.6195		4.4822	2.0947		6.6858	8.0059
CA-NS1	Canada - UCI-1850 burn site	ENF		264.9333		3.2930	2.2505	57.1763	-1.3234	2.1098
CA-NS2	Canada - UCI-1930 burn site	ENF		255.3197		3.4981	2.0168	54.0228	3.9766	0.4515

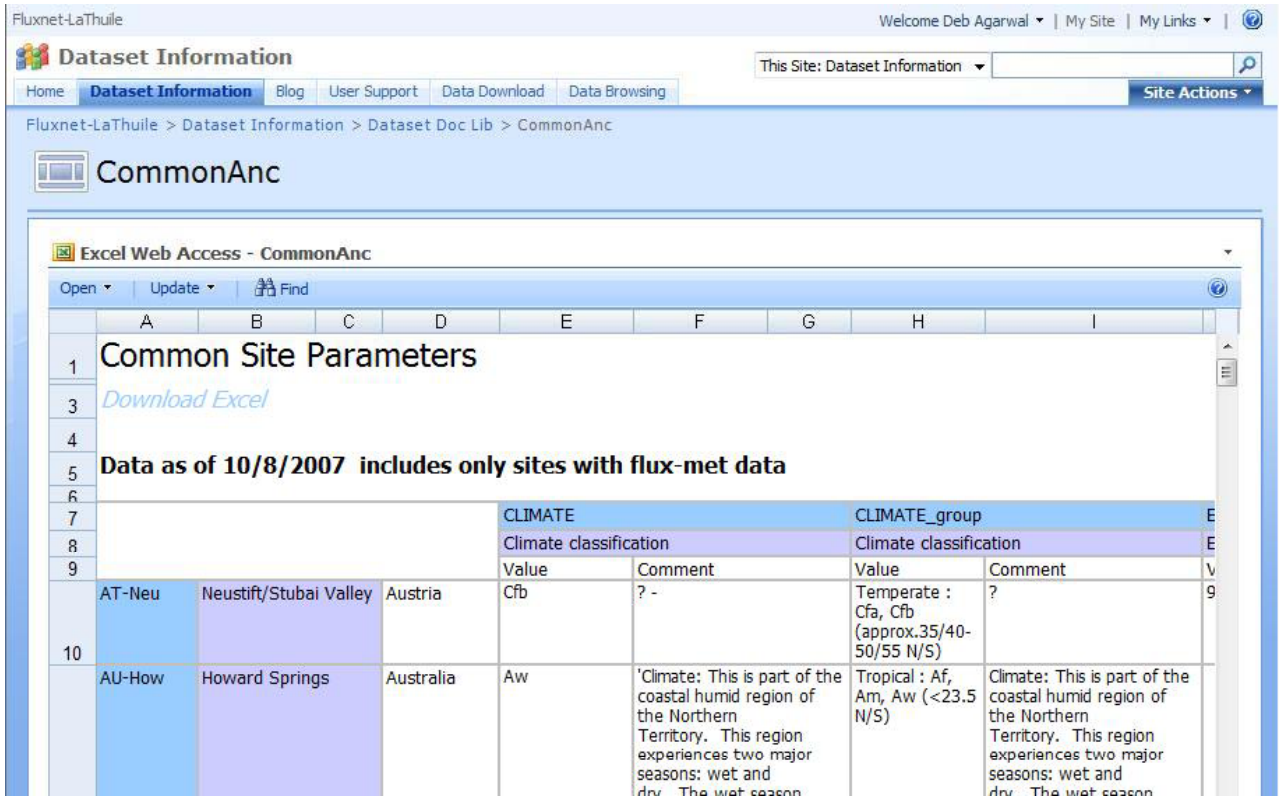
Live demo of data reports



		2003	2004	2005
TA	CA - Tonzi Ranch	35040	34695	34306
	CA - Vaira Ranch	17520	16499	15347
	OR - Metolius-first young aged pine		17568	17520
	OR - Metolius-intermediate aged ponderosa pine	17520	17568	17520

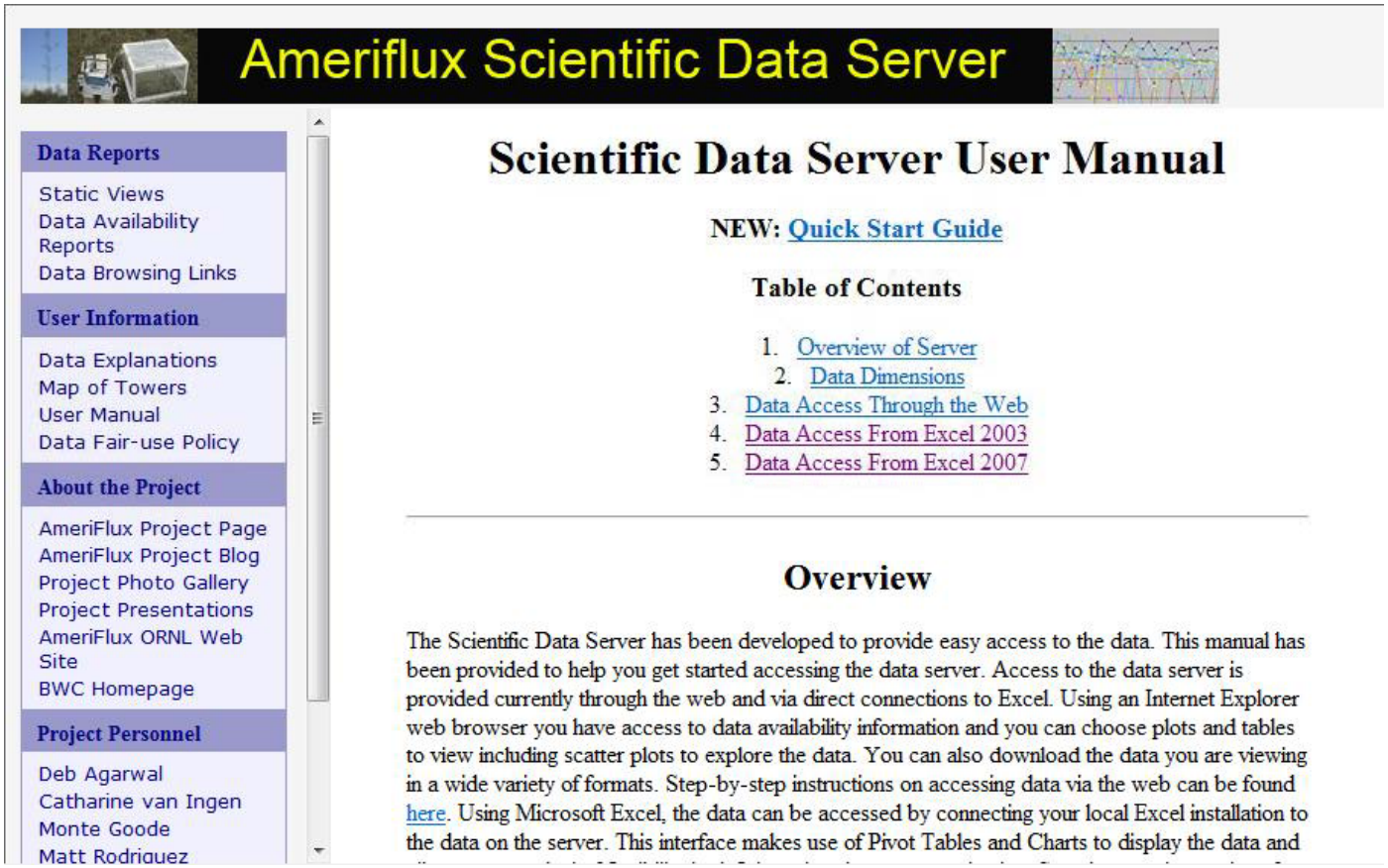
Ancillary Data Reports

- Live demo



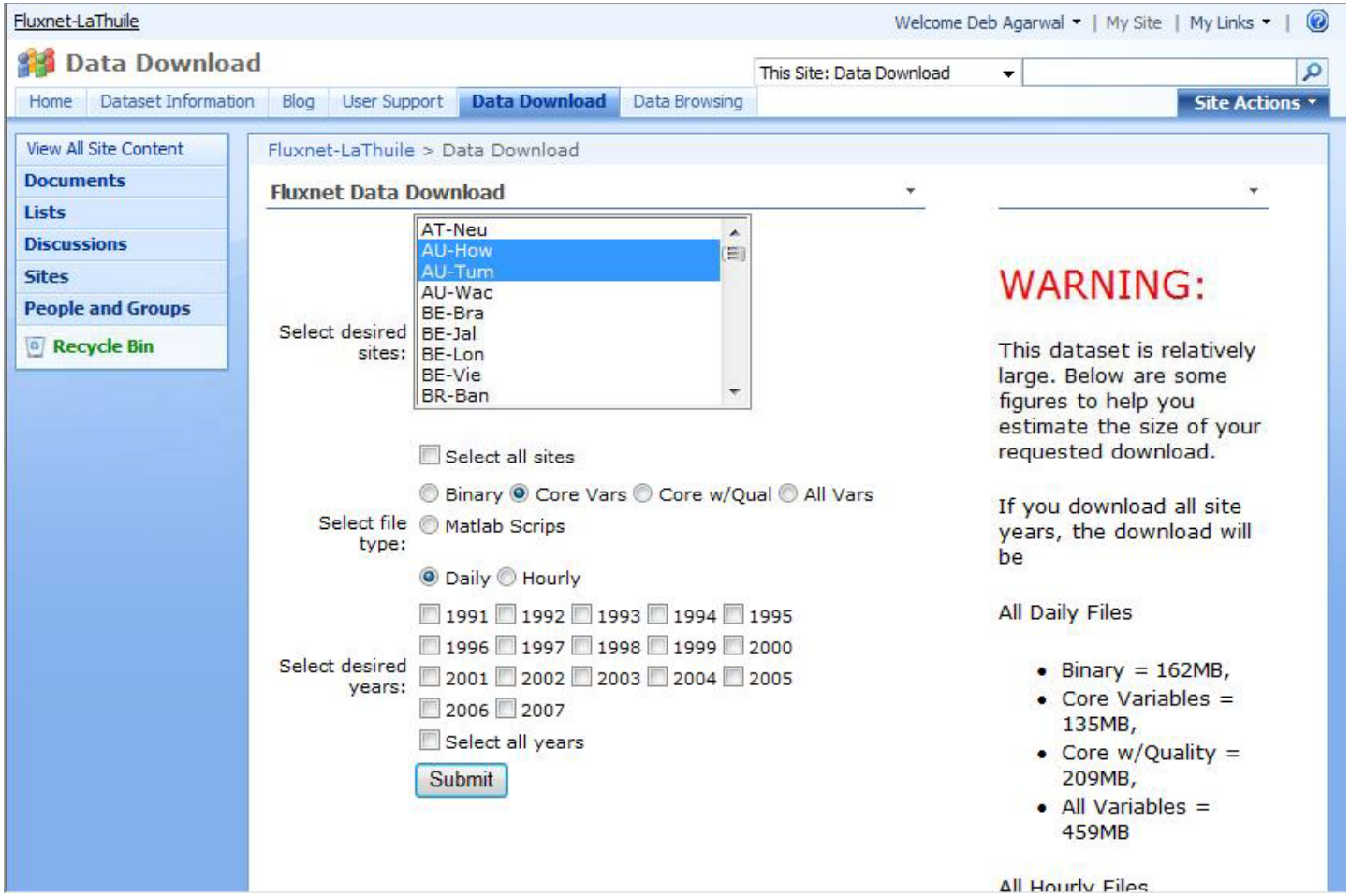
User Manual

- Live Demo



Tips and Tricks

- Saving connection information
- Grand totals
- Field totals
- Embedded connection in table

The End

Downloading Data