Getting Data from the ARM Archive

Orientation for new
Science Team Members

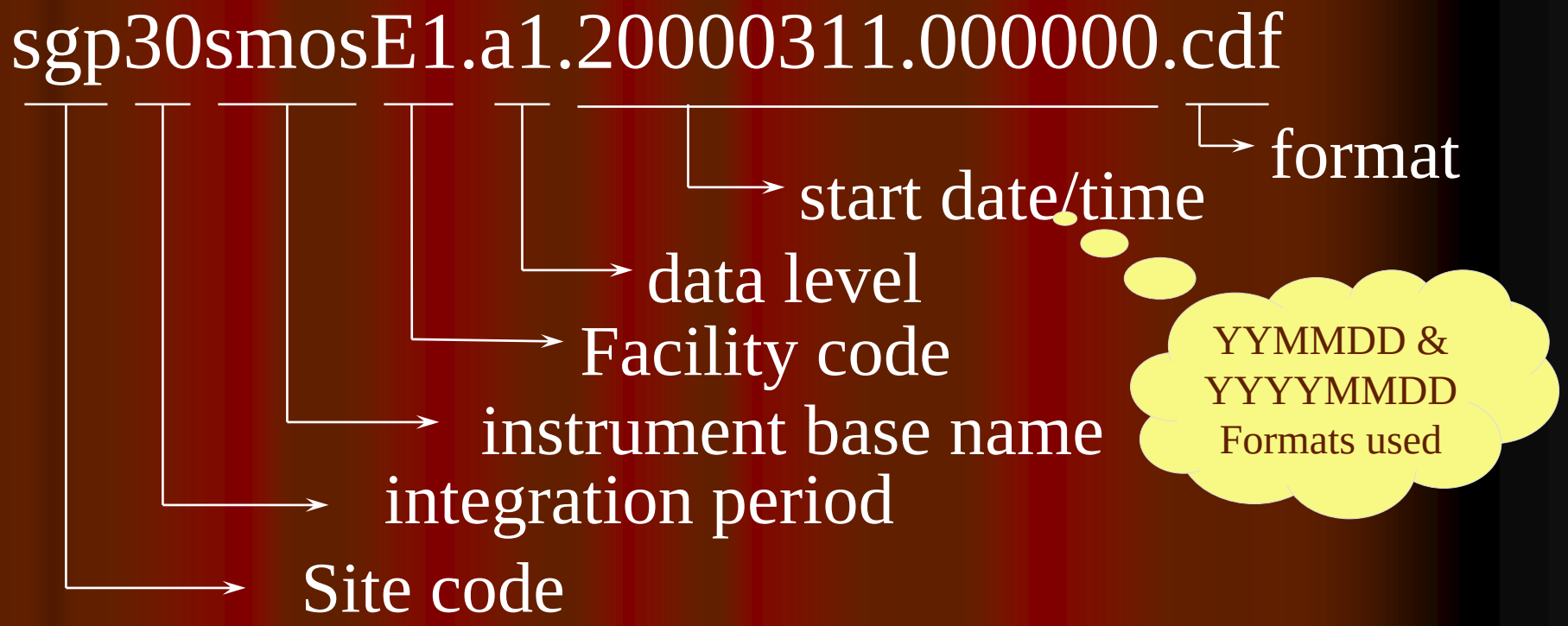
ARM Shopping Cart Tutorial

- Available at: http://dev.www.arm.gov/data/arm_orderData_tutorial.html

Types of Quality Information

- Automated products
  - QC flags
    - inserted in data files during processing
  - Summaries of flags (data color)
- Manual products
  - Data Quality Reports (DQRs)
    - web accessible reports; delivered as html files after data requests (more later); event driven and problem-based
  - Instrument Mentor Monthly Summary Reports
    - web accessible; linked to instrument web pages.
  - Data Quality Assessment Reports

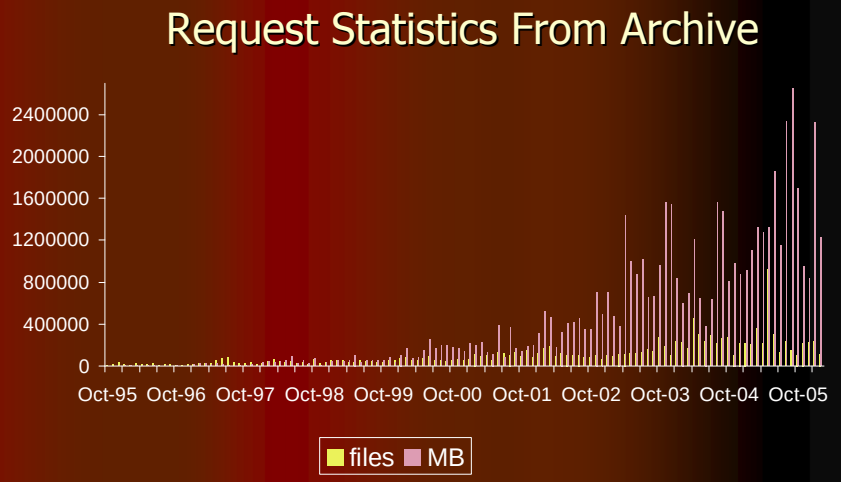
sgp30@%$#&!!!
(or, making sense of the ARM file naming convention)

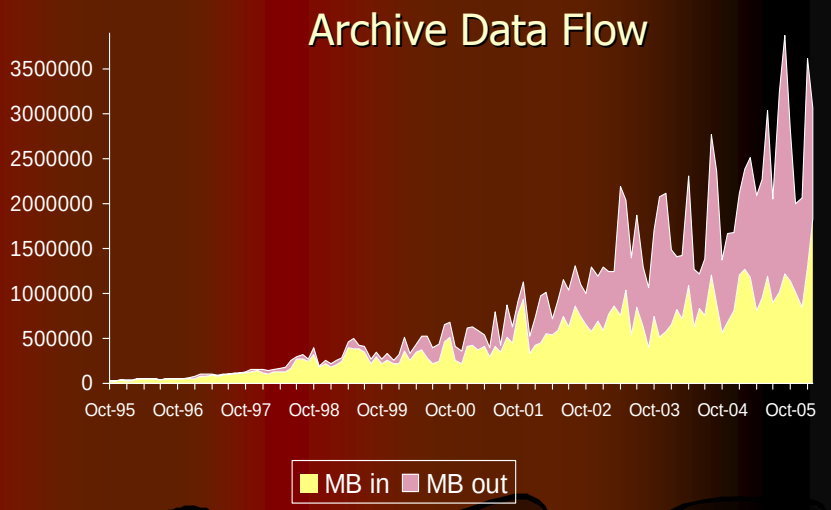


Archive Overview

You are NOT alone...

- 3 sites
- 10's facilities
- 100's data sources
- 100's data users
- 1000's measurement types
- 1,000,000's data files
- 1,000,000,000's measurements
- 10,000,000,000,000's bytes





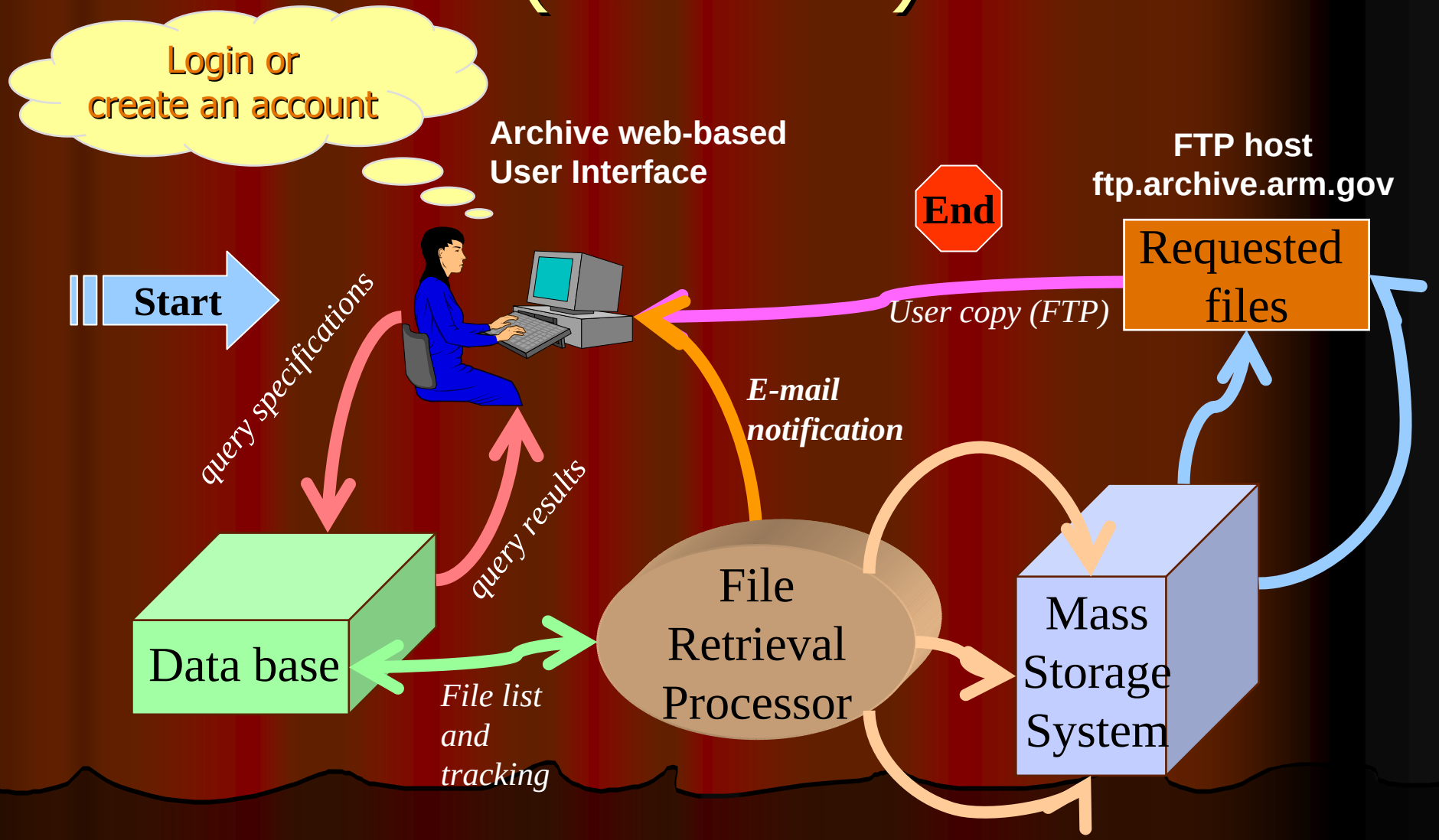
Accessing Data from the Archive

- User interface options
  - ARM Data Browser
  - Catalog Interface
  - Thumbnail Browser
  - Web Shopping Cart
  - IOP Data Browser
  - *Contact Us…..*
    - *1-888-ARM-DATA, armarchive@ornl.gov*
- Archive guts and trivia (sanitized view)
- Continuous data distribution
  - "Standing Orders"

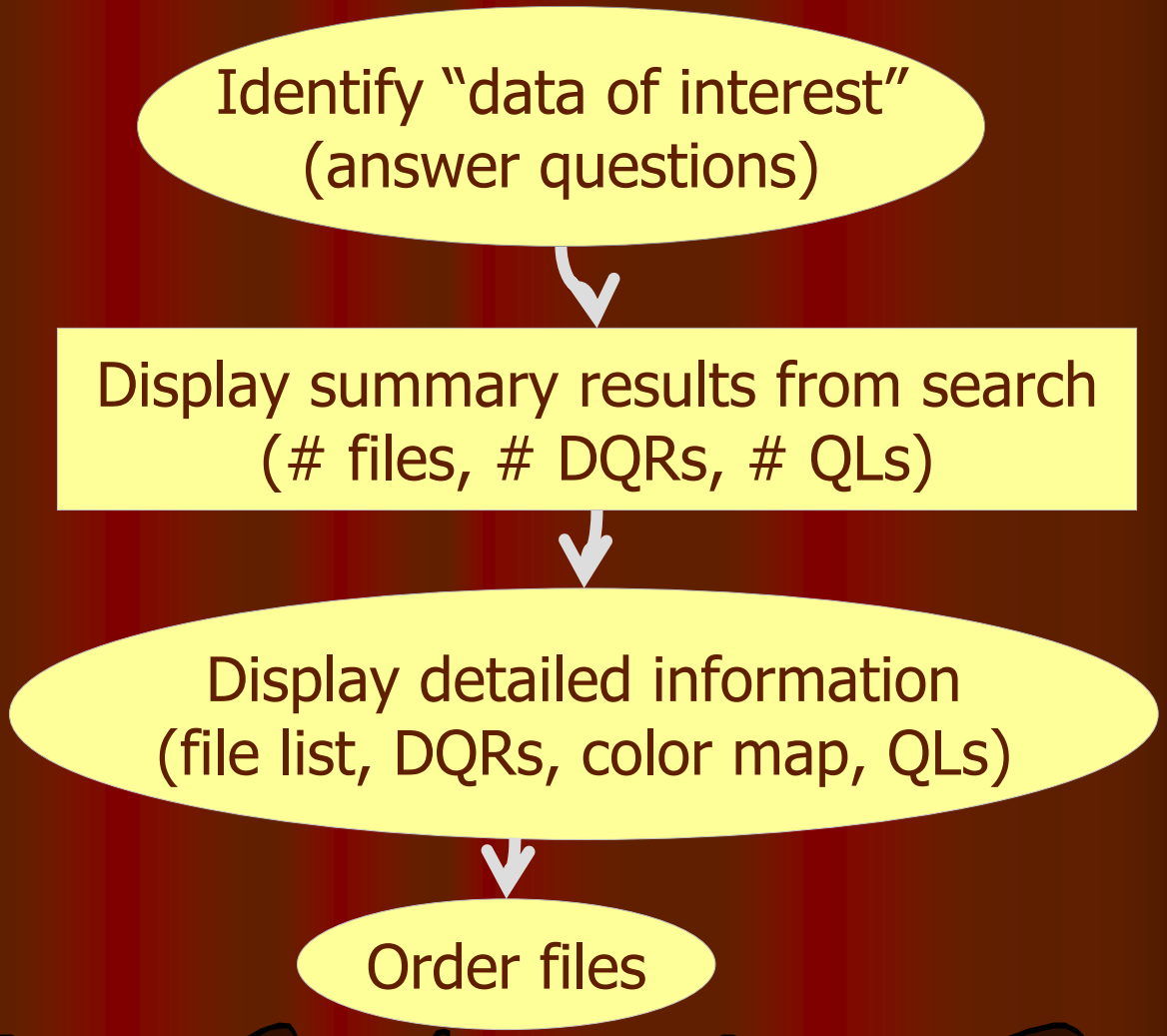
Comparison of User Interface Options

Interface name	Accessible data	"*Shopping*" approach (armarchive@ornl.gov, 1-888-ARM-DATA)
ARM Data Browser	Routine ARM data	*"I know what I want. Do you have it?"* Searching with predefined selection criteria.
Catalog Interface	Routine ARM data	*"I am not sure what I want. I need to see what you have available."* Browsing a hierarchy of availability summaries.
Thumbnail Browser	Most routine ARM data	*"I will know what I want when I see it."* Searching with a combination of predefined selection criteria and visual review of data plots
Web Shopping Cart	Routine ARM data and some IOP data	*"I need to read about what you have, then I will decide."* Discover areas of interest by browsing the ARM web documentation and collect items of interest.
IOP Data Browser	IOP, special, PI, and beta data	*"I need to look in the odd parts bin."* Direct access to IOP data. Navigate /year/site/iop directory tree. Also use narrow Google search.

You and the Archive 'Guts' (Sanitized)

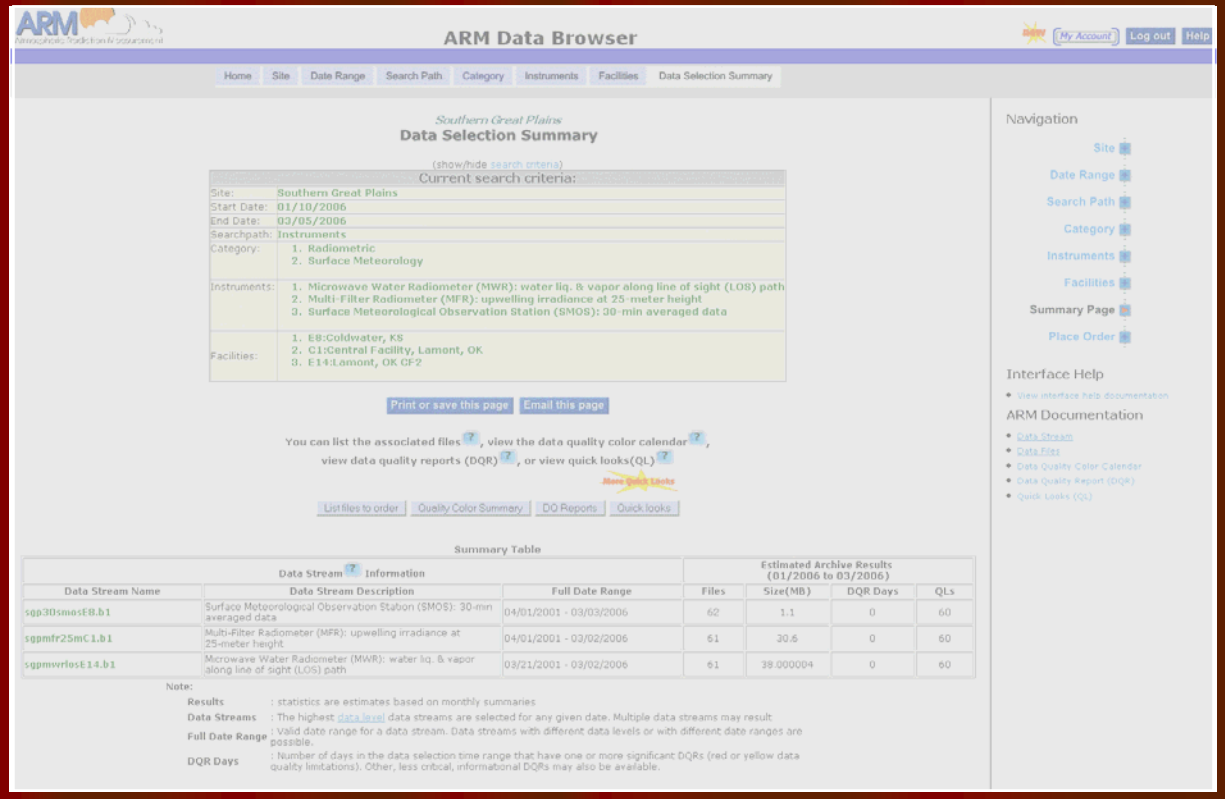


Overall Interface Scheme

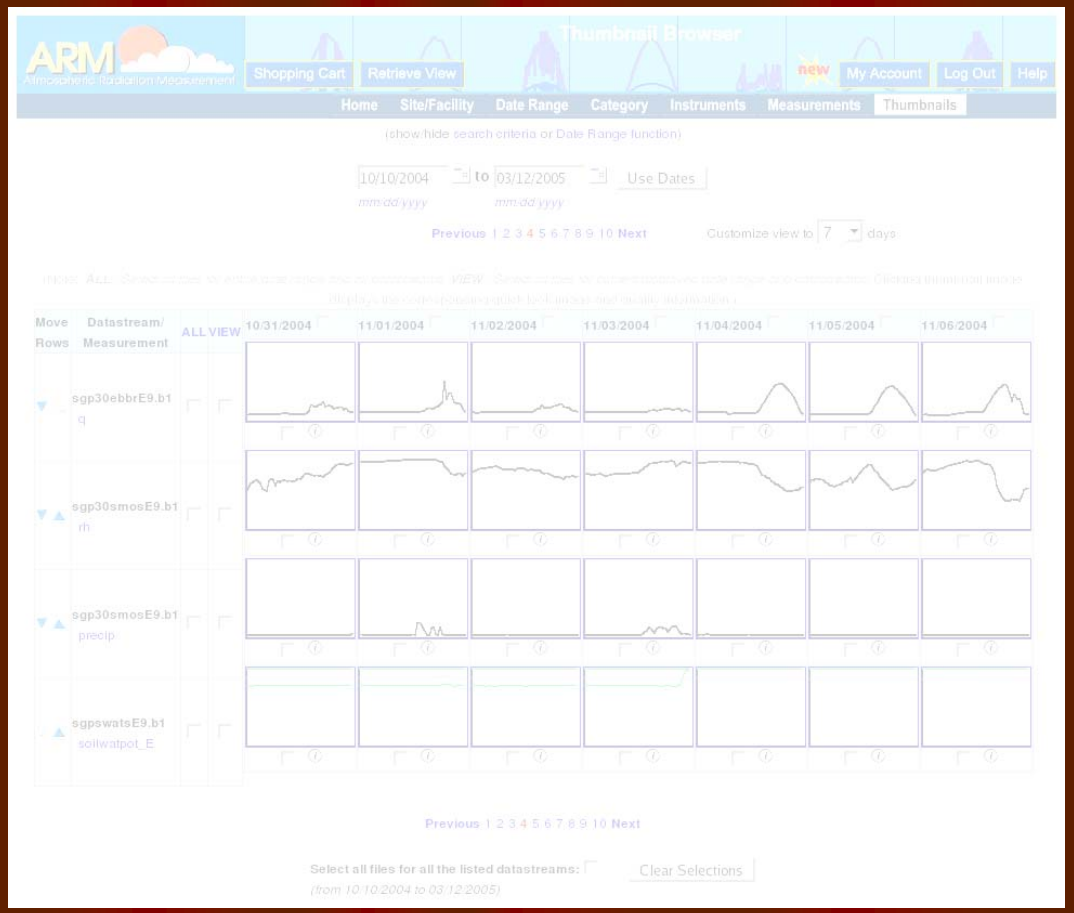


Interface Demonstrations

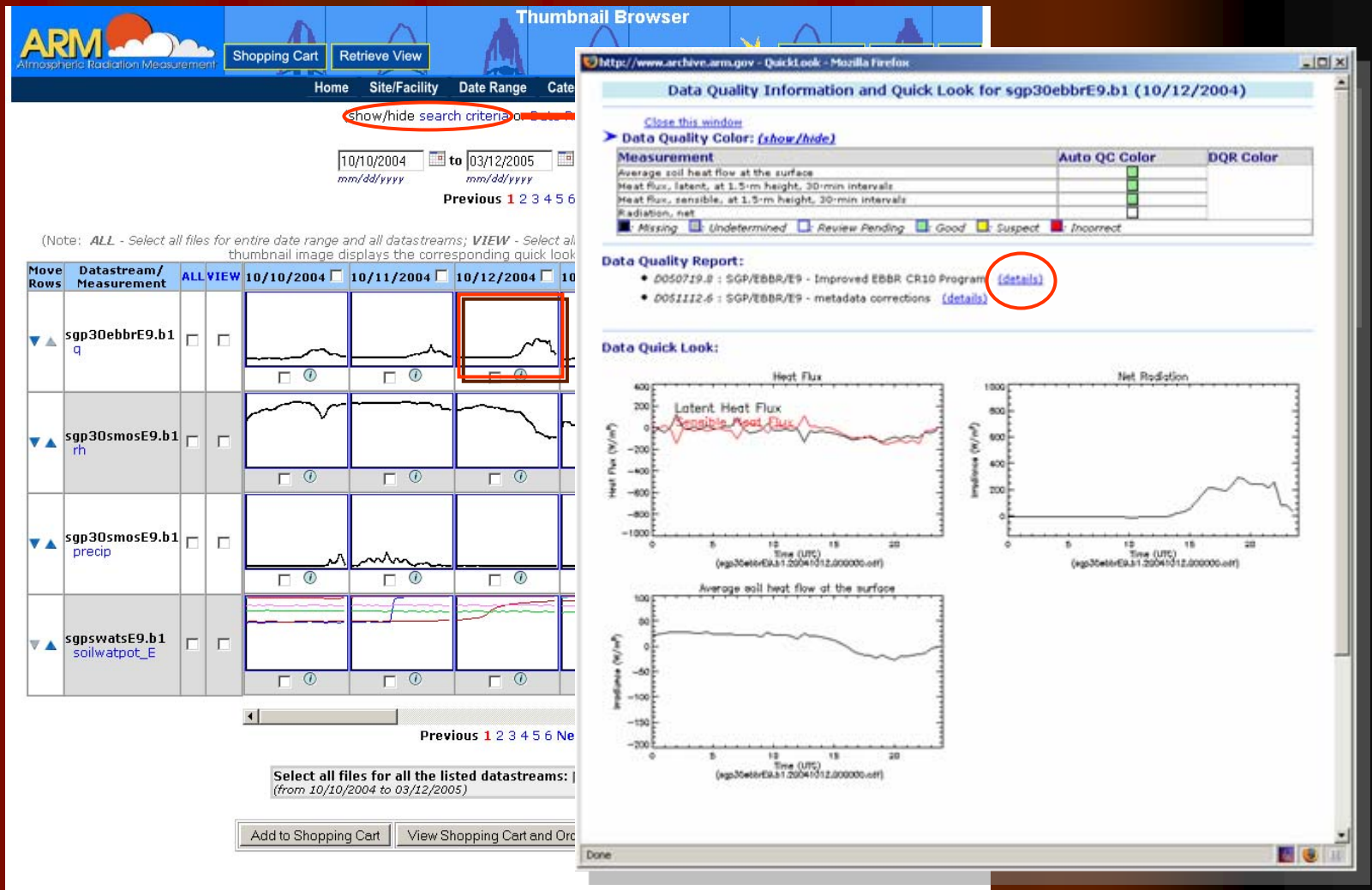
ARM Data Browser



ARM Thumbnail Browser

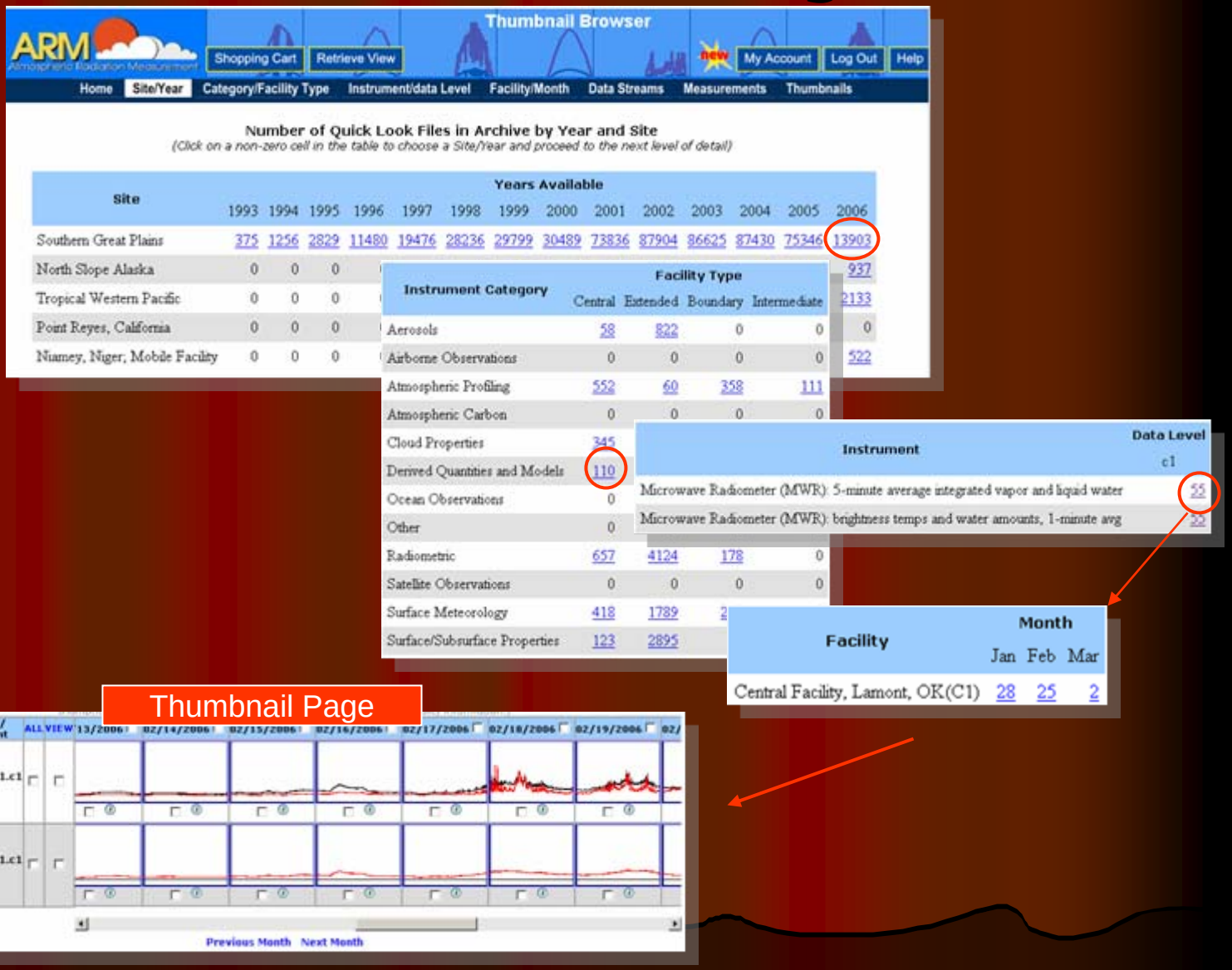


Display Thumbnails



Measurement Code Descriptions	
q	Radiation, net
rh	Humidity, relative, at 2-m height, 30-min intervals
precip	Precipitation, 30-min intervals
soilwatpot_E	Soil Water Potential, East Profile

Thumbnail Browser – Catalog Interface



ARM Catalog Browser

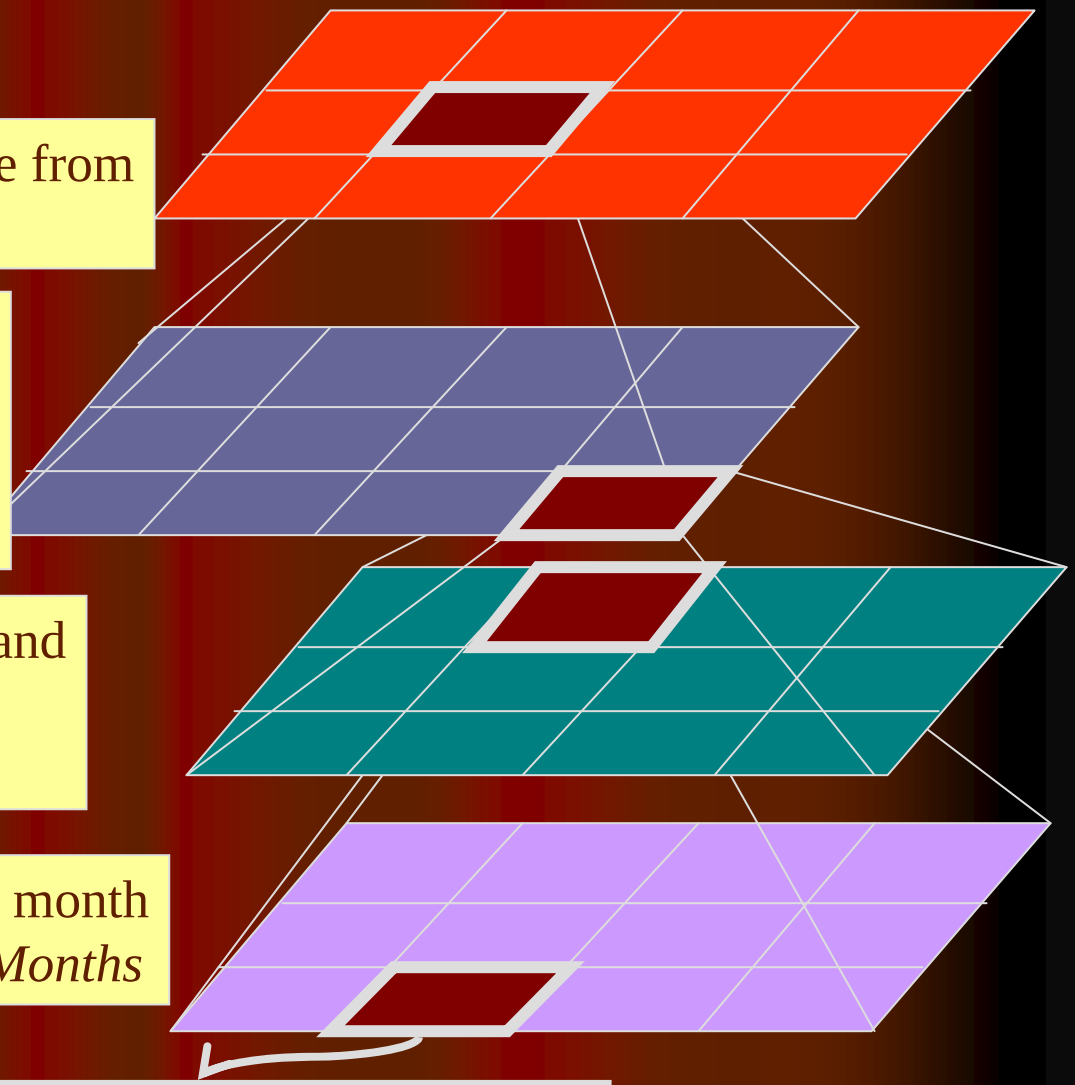
Logical Flow of Catalog Interface

Step1: select a year and a site from a table of *Years x Sites*

Step 2: select a facility type and instrument category from a table of *Instrument category x Facility type*

Step 3: select an instrument and a data level from a table of *Instruments x Data levels*

Step 4: select a facility and a month from a table of *Facilities x Months*



Data added to 'shopping cart'

Features of Catalog Tables

A: Title of the Table; showing selection ategories

B: Links to higher selection screens

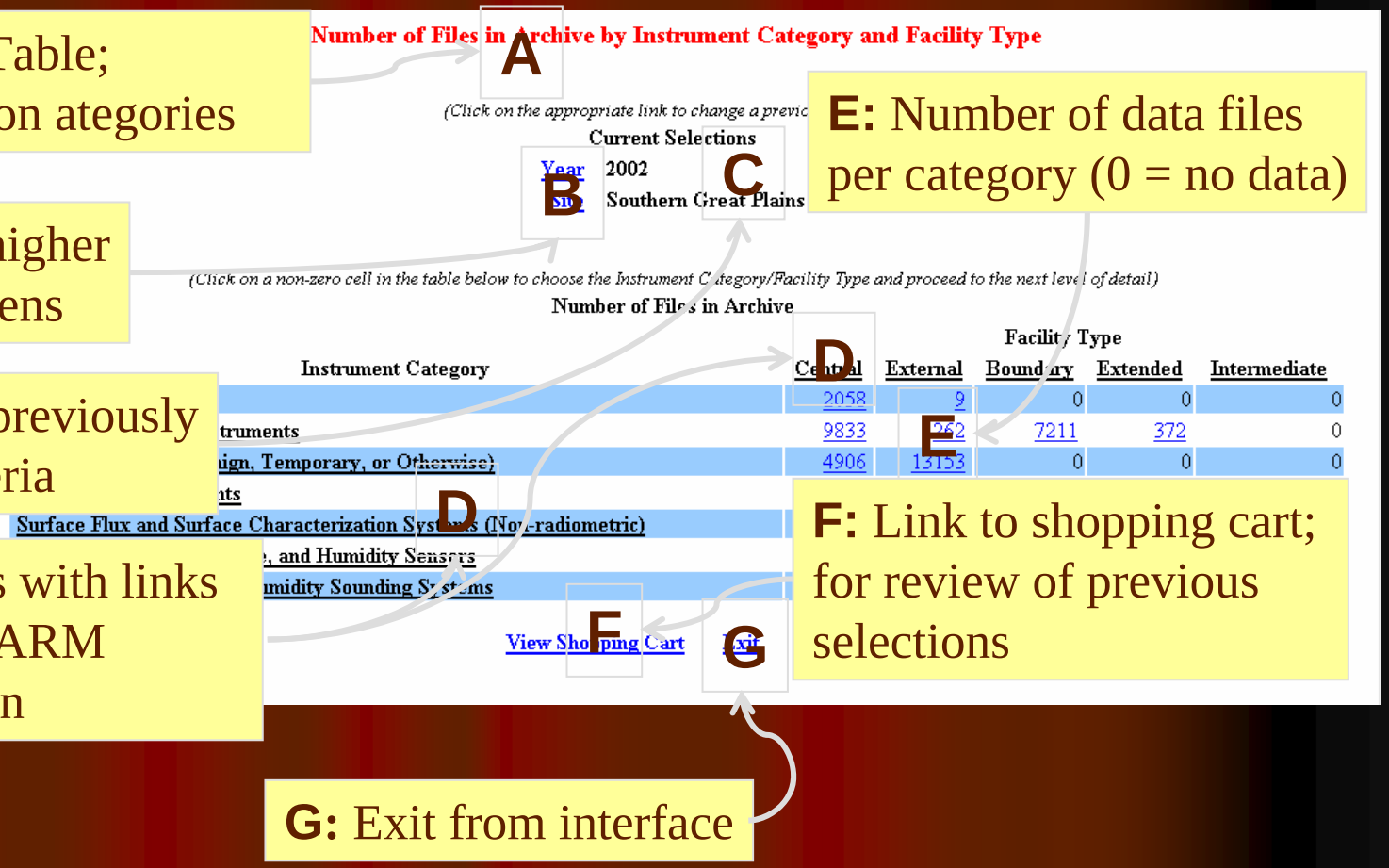
C: values of previously selected criteria

D: Categories with links to additional ARM documentation

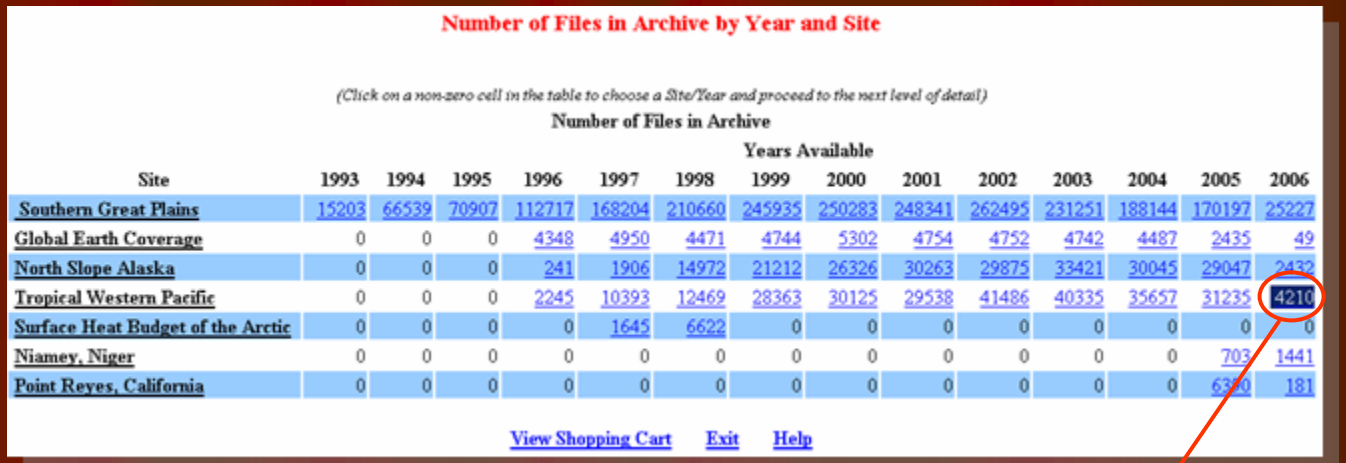
E: Number of data files per category (0 = no data)

F: Link to shopping cart; for review of previous selections

G: Exit from interface



Catalog Browser (1)



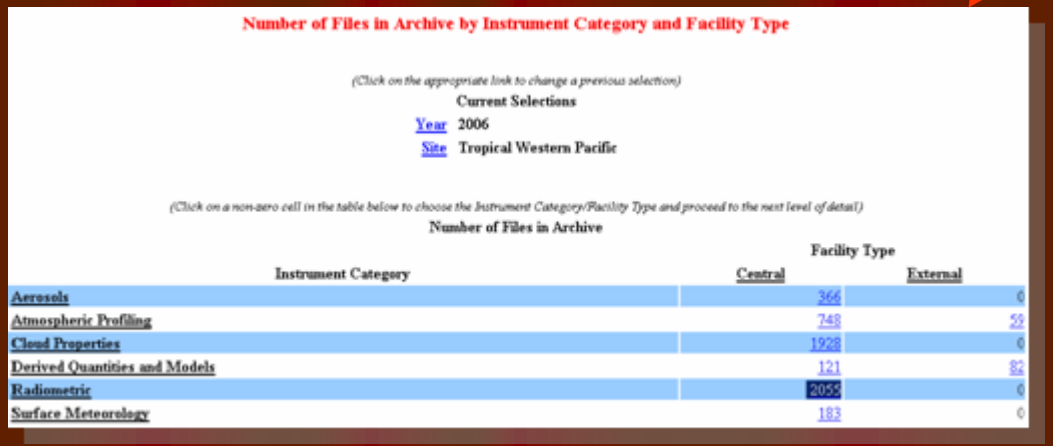
Number of Files in Archive by Year and Site

(Click on a non-zero cell in the table to choose a Site/Year and proceed to the next level of detail)

Number of Files in Archive

Site	Years Available 1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Southern Great Plains	15203	66539	70907	112717	168204	210660	245935	250283	248341	262495	231251	188144	170197	25227
Global Earth Coverage	0	0	0	4348	4950	4471	4744	5302	4754	4752	4742	4487	2435	49
North Slope Alaska	0	0	0	241	1906	14972	21212	26326	30263	29875	33421	30045	29047	2432
Tropical Western Pacific	0	0	0	2245	10393	12469	28363	30125	29538	41486	40335	35657	31235	4210
Surface Heat Budget of the Arctic	0	0	0	0	1645	6622	0	0	0	0	0	0	0	0
Niamey, Niger	0	0	0	0	0	0	0	0	0	0	0	0	703	1441
Point Reyes, California	0	0	0	0	0	0	0	0	0	0	0	0	6330	181

View Shopping Cart Exit Help



Number of Files in Archive by Instrument Category and Facility Type

(Click on the appropriate link to change a previous selection)

Current Selections

Year 2006

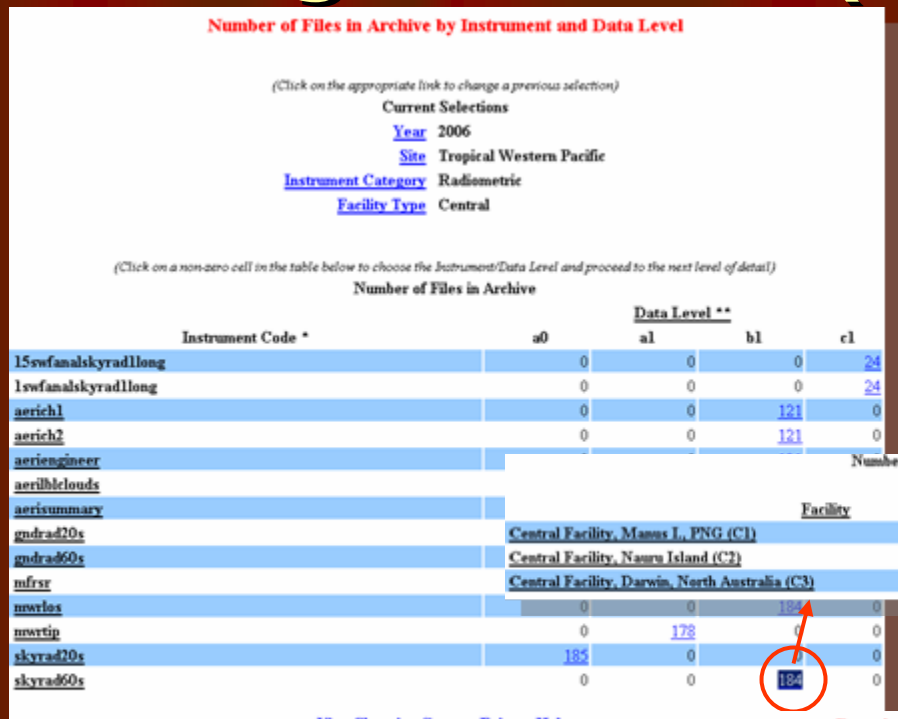
Site Tropical Western Pacific

(Click on a non-zero cell in the table below to choose the Instrument Category/Facility Type and proceed to the next level of detail)

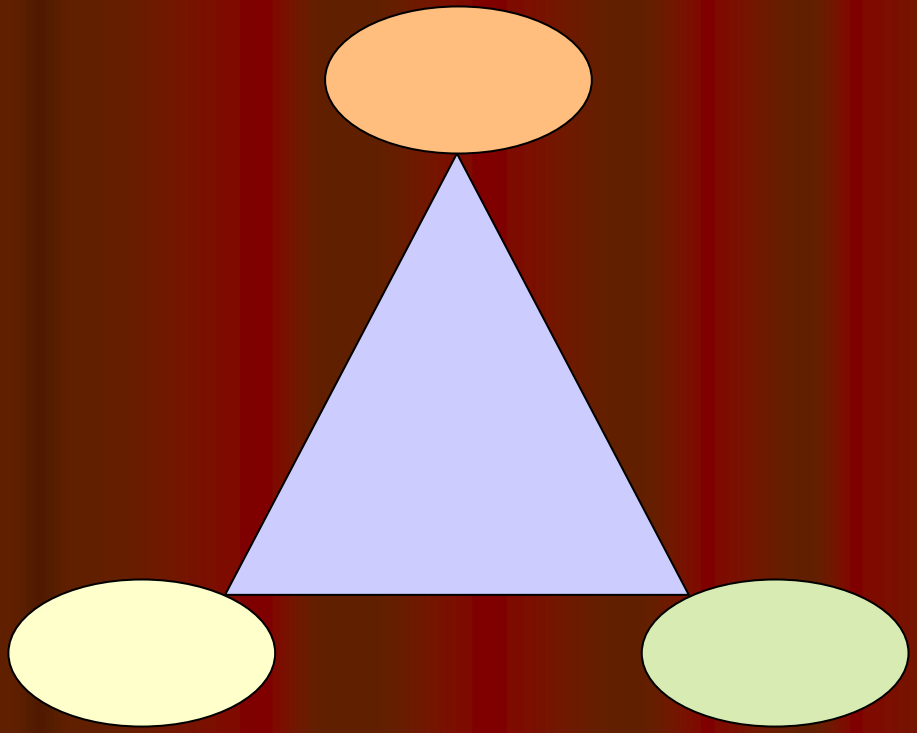
Number of Files in Archive

Instrument Category	Facility Type Central	External
Aerosols	366	0
Atmospheric Profiling	748	59
Cloud Properties	1928	0
Derived Quantities and Models	121	82
Radiometric	2052	0
Surface Meteorology	183	0

Catalog Browser (2)



Types of ARM Data



ARM Data Types - overview

- Continuous data (stored offline, accessible by requests from user interface)
  - ARM collected data
  - Value added products
  - External data
- Special data (stored online, accessible from web interface)
  - Field Campaign (IOP) data
  - Beta data
  - PI generated data products

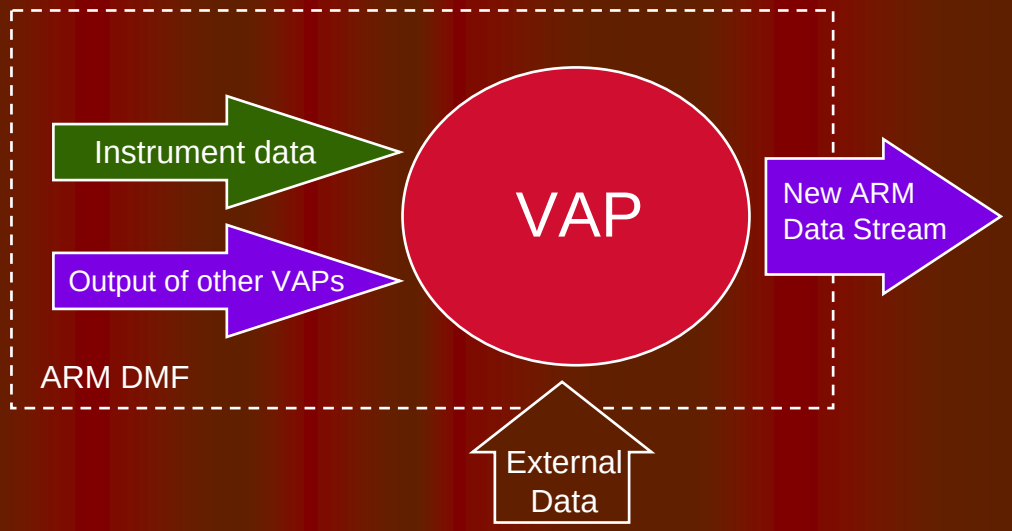
ARM Data Types – more detail

armarchive@ornl.gov
1-888-ARM-DATA

- ARM collected data
  - RAW data files
    - Available upon request, but not accessible from User Interface
    - Minimal documentation; user beware
    - Wide variety of formats; many are binary
  - Processed data files
    - Accessible from user interfaces
    - Common formats include NetCDF and HDF
- Value added products (VAPs)
  - Include one or more of the following
    - Advanced algorithms
    - Multiple data inputs
    - Input from long-time periods
  - ARM produces some VAPs to improve the quality of existing measurements. In addition, when more than one measurement is available, ARM also produces "best estimate" VAPs.

More on VAPS…

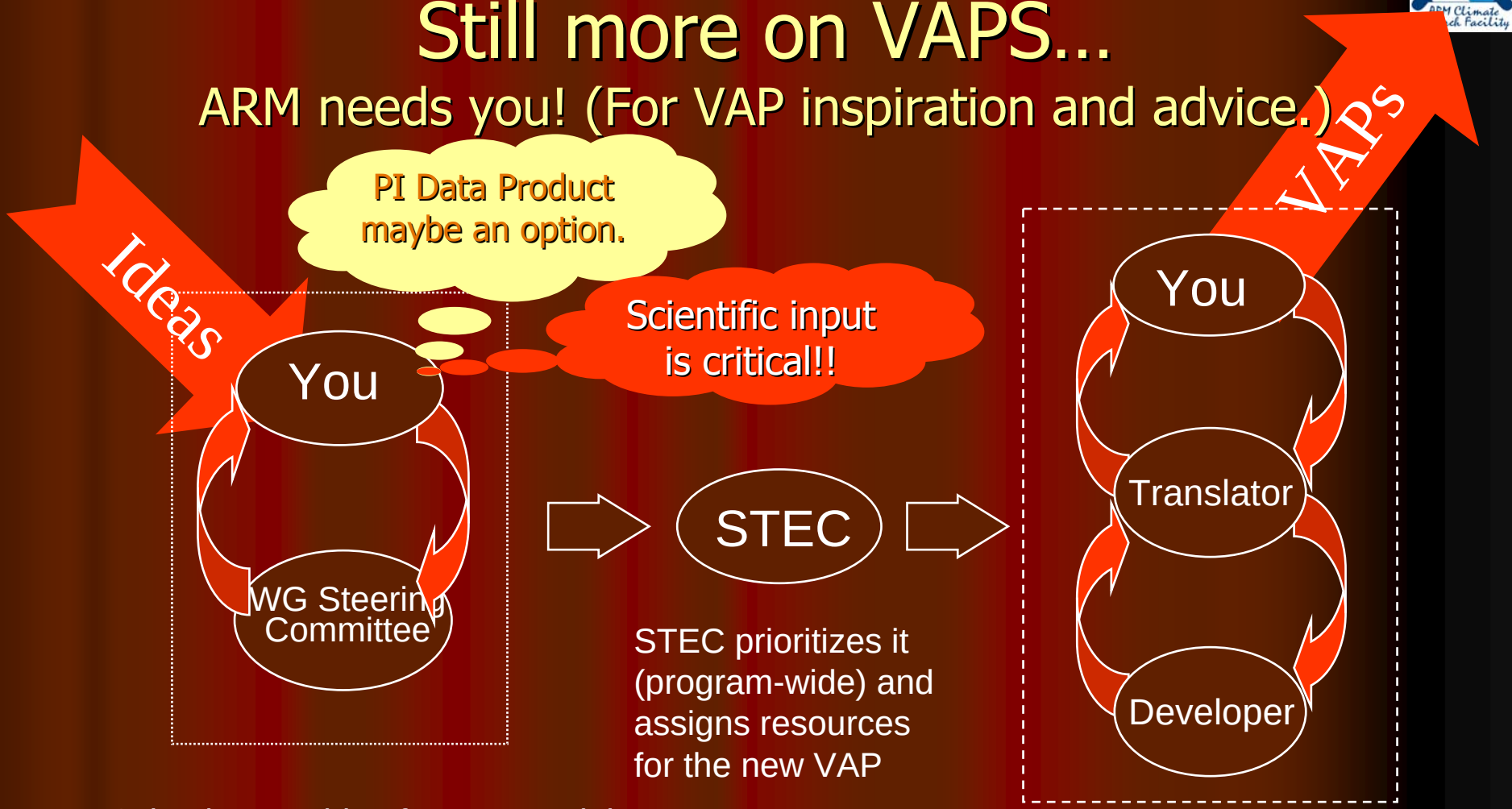
- VAPs are products from automated analytical procedures (models, retrievals, etc.) that are run in the ARM data system
- Inputs come from instruments, other VAPs, and/or external data
- Output is a new ARM data stream



- ARM wants your input. Please note *"Procedure for Submitting Science and Research Products to the Data Archive"* at: http://www.arm.gov/data/pi_procedure.stm

Still more on VAPS...

ARM needs you! (For VAP inspiration and advice.)



Scientist gets idea for new model or algorithm and presents it to the WG. The WGSC prioritizes the idea and contacts the STEC

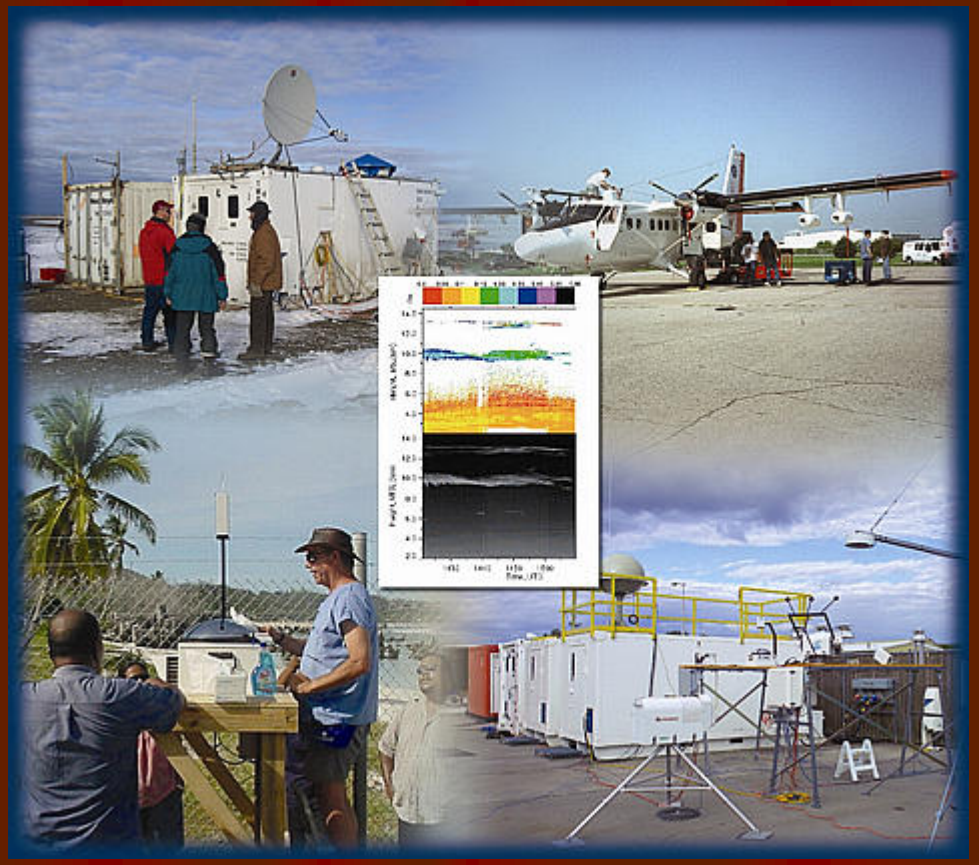
STEC prioritizes it (program-wide) and assigns resources for the new VAP

Translator works with the Scientist to further define the algorithm, and then interacts with the Developer to implement the VAP. Translator and the Scientist then evaluate and document.

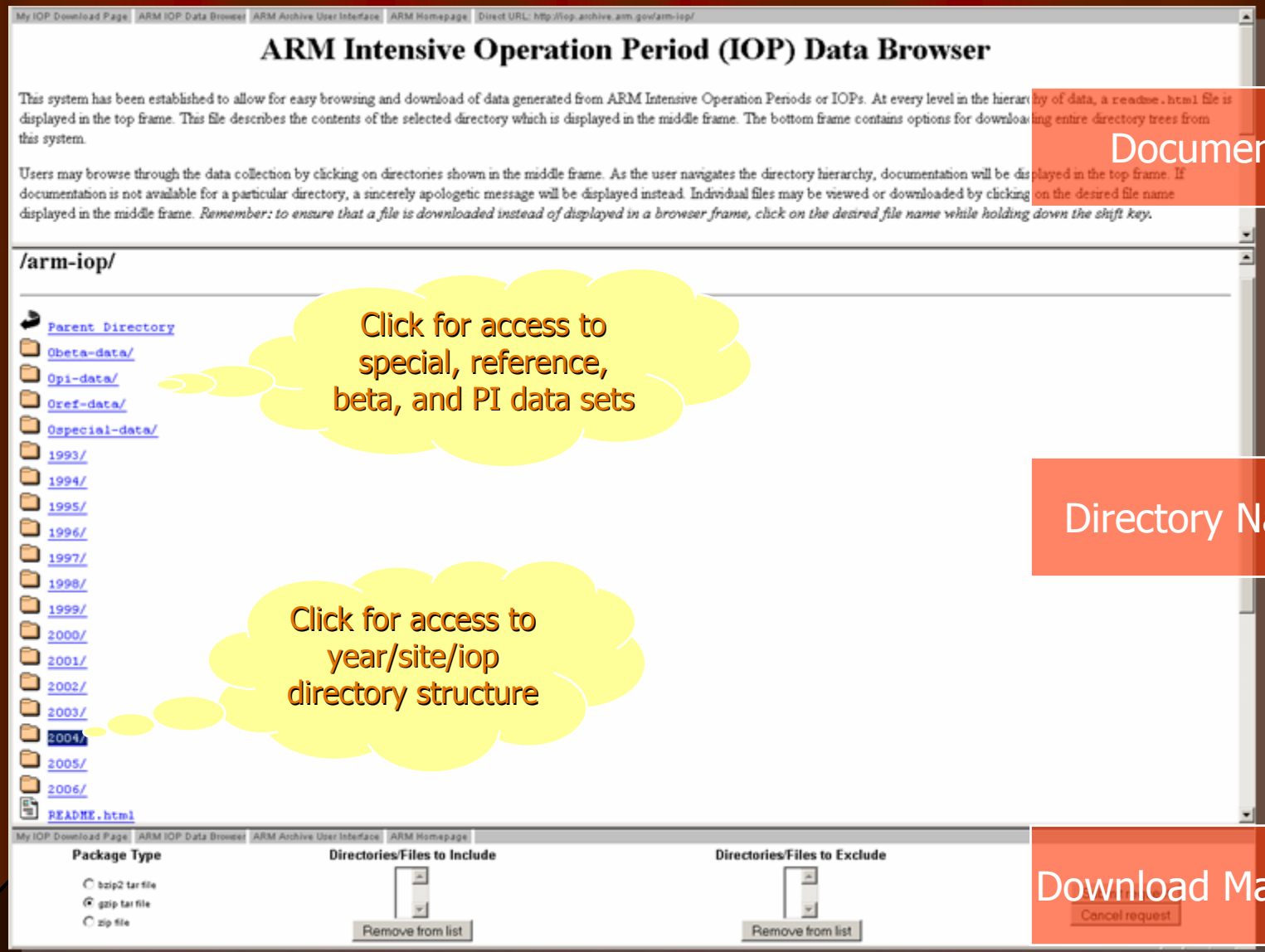
ARM Data Types – still more detail

- External data
  - Generated by other programs (e.g., NOAA weather models, NASA satellites, etc.)
  - Many formatted into NetCDF consistent with ARM style
  - Specialized subsets specific to ARM sites
    - Geographic clips of global data
- Field Campaign Data
  - Special experiments (e.g., M-PACE, 2003 Aerosols, etc.)
  - Stored online in separate data structure
- PI generated data products
  - Considered useful to ARM users
  - Provided "at will" by a researcher
  - Supported by the researcher

ARM IOP Data Browser



IOP Data Browser – "home page"

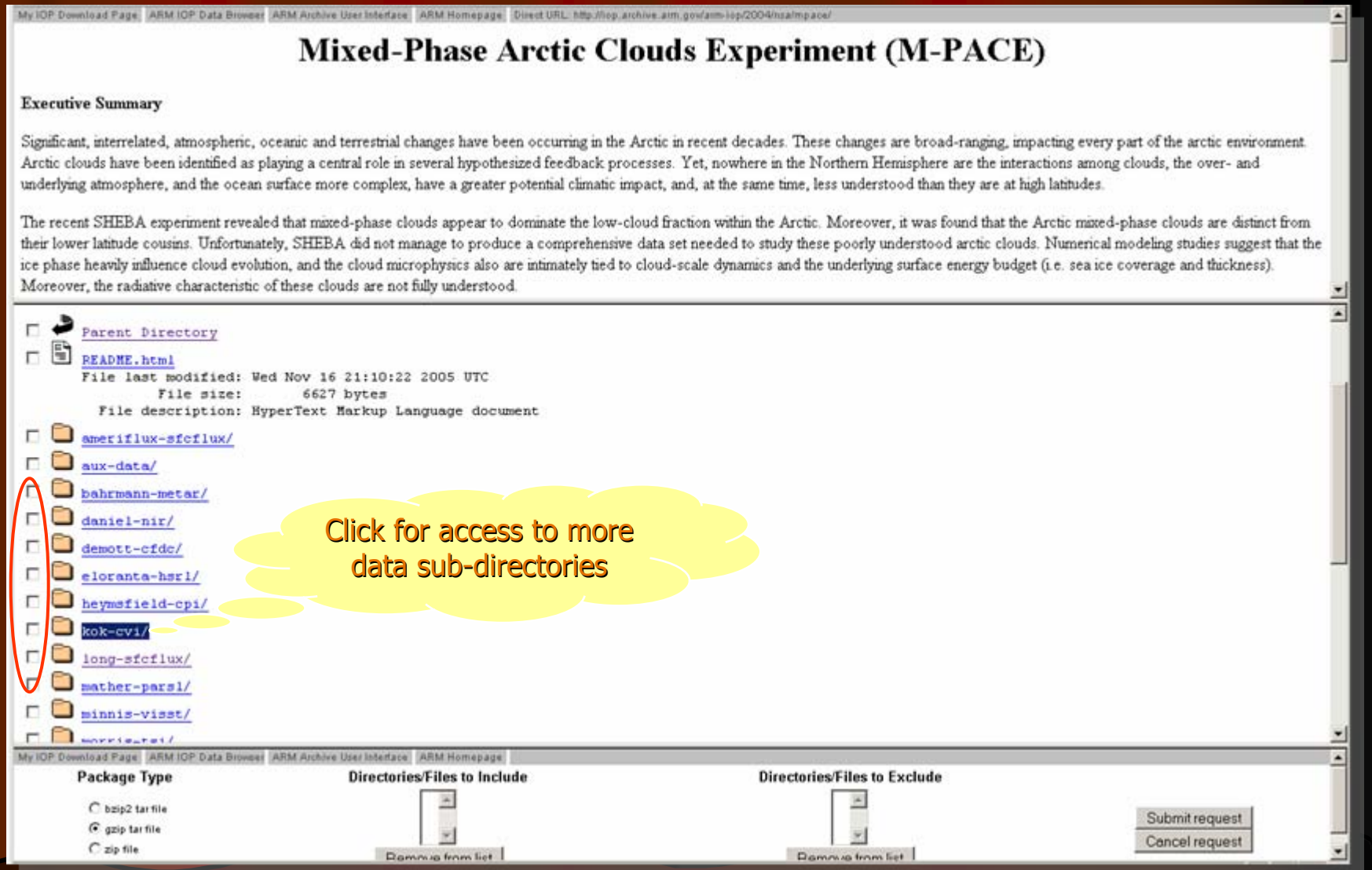


Documentation

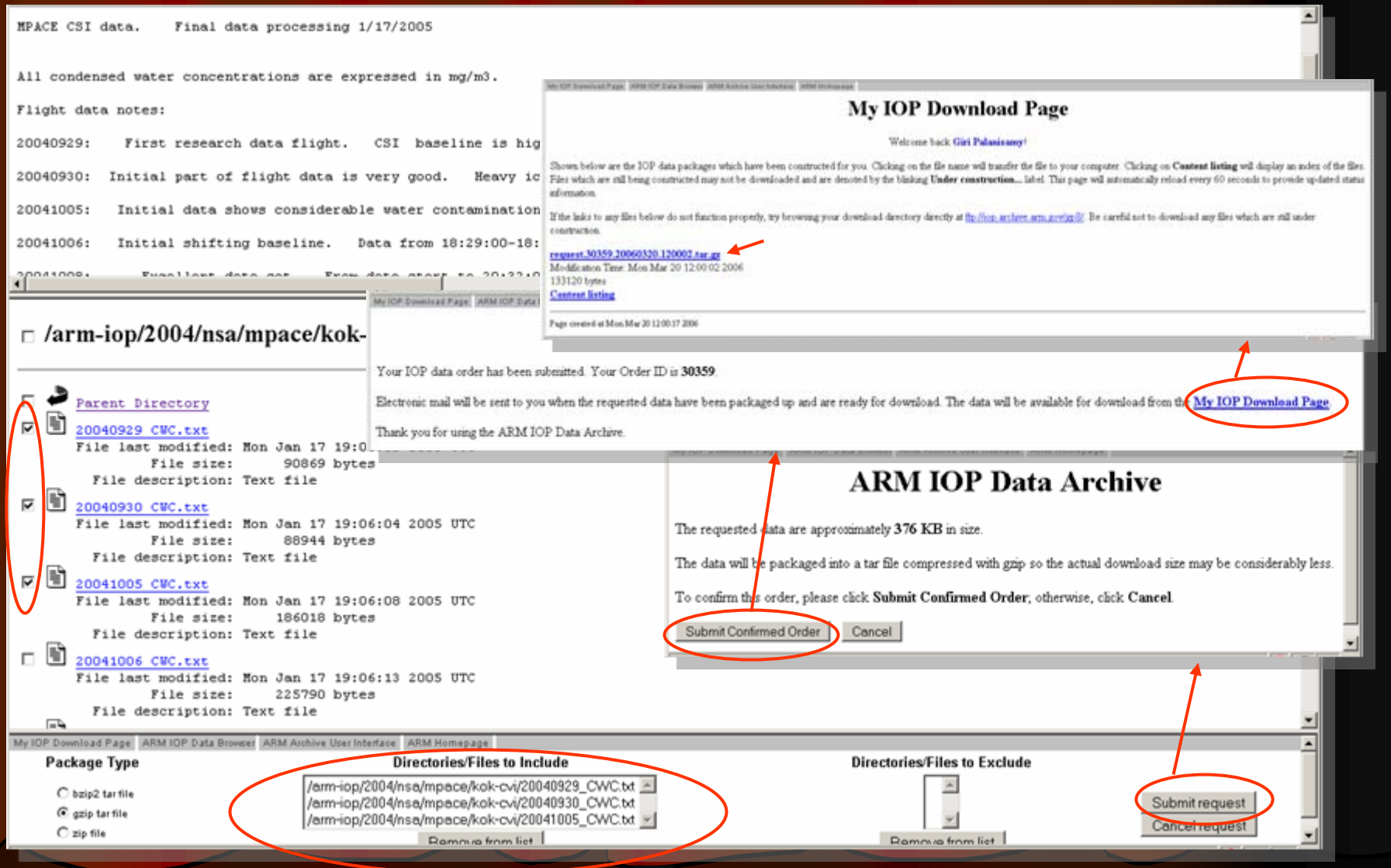
Directory Navigation

Download Management

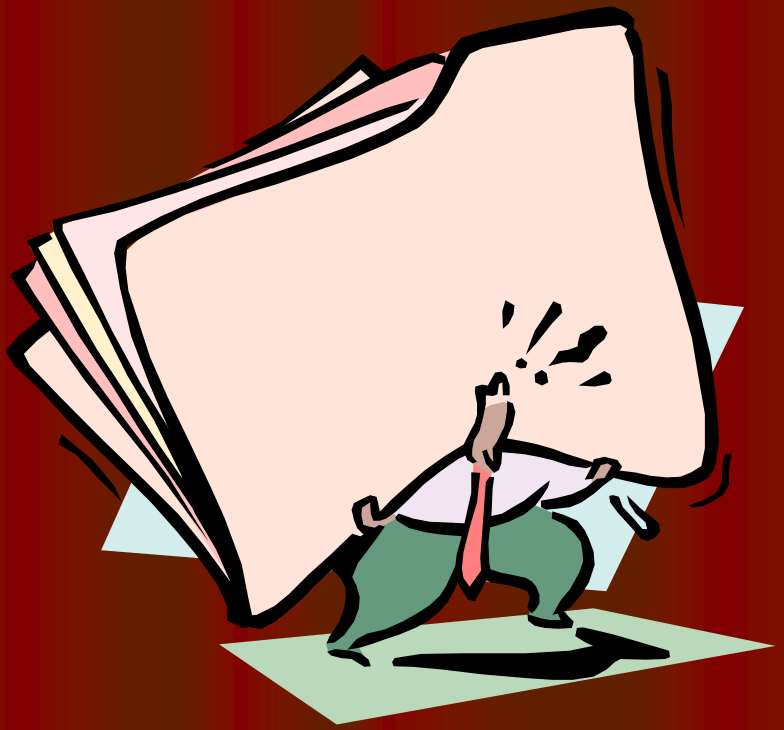
IOP Data Browser – IOP View



IOP Data Browser – Download Bulk Data



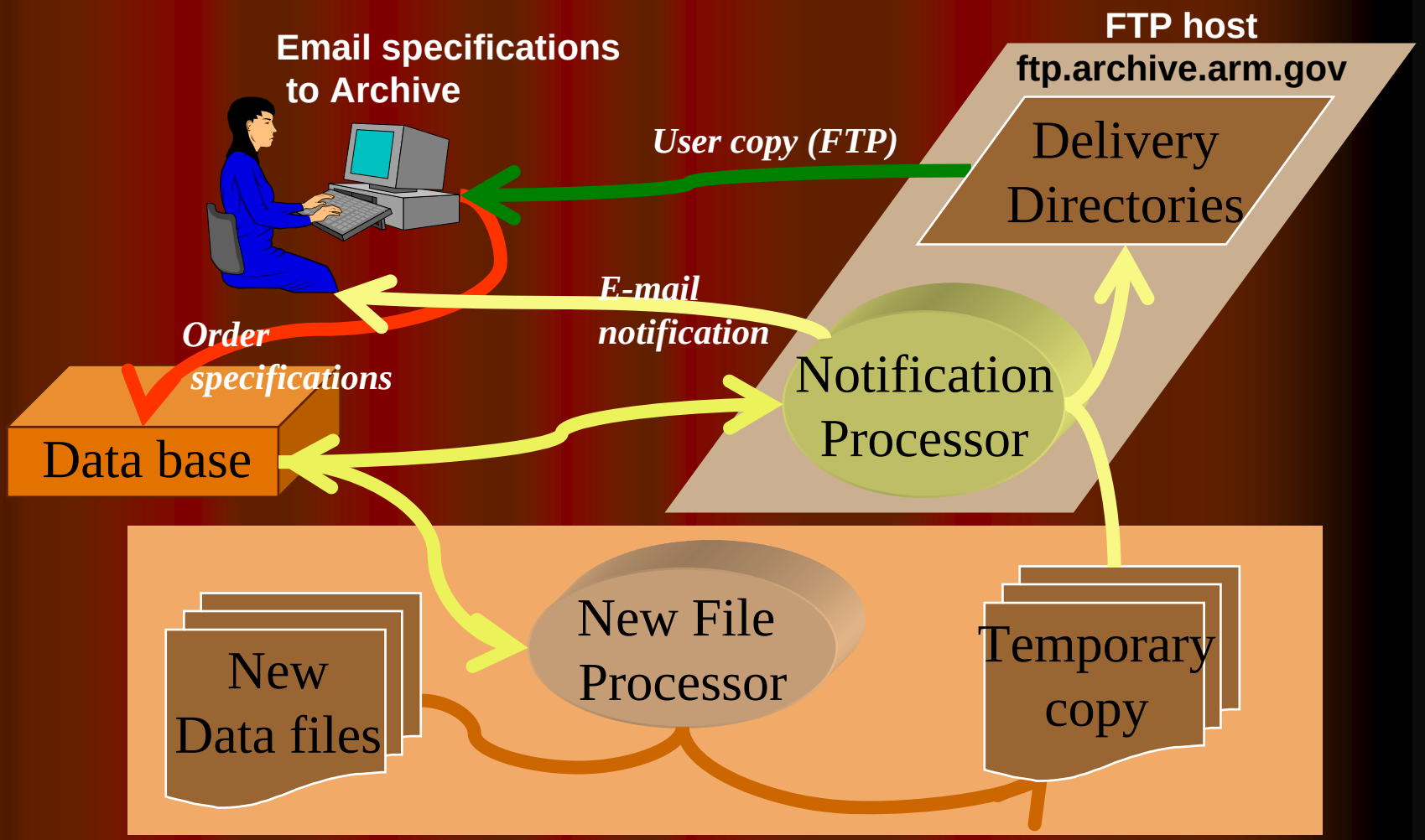
"Yes, I always want it." (Standing Orders)



"Standing Orders": Data Distribution Upon Arrival

- A "Standing Order" is an open request for access to a copy of all new files arriving at the Archive
  - Matching a user-specified set of data streams
  - Arriving during a delivery period
- Designed for users wanting to:
  - Access data shortly after Archival
  - Build their own complete collection of selected data streams

Standing Order Processing



Standing Order Information

- Online documentation
  - http://www.archive.arm.gov/docs/standing-orders.html
- Send request:
  - What data streams?
  - What delivery frequency?
  - To: armarchive@ornl.gov
- More details in reference section of handout

Contact Us at . . .

- ARM Information
  - http://www.arm.gov
  - info@arm.gov
  - 1-888-ARM-DATA (1-888-276-3282)
- Archive Assistance
  - armarchive@ornl.gov
  - Call "1-888-ARM-DATA"
  - FAX 1-865-574-4665