

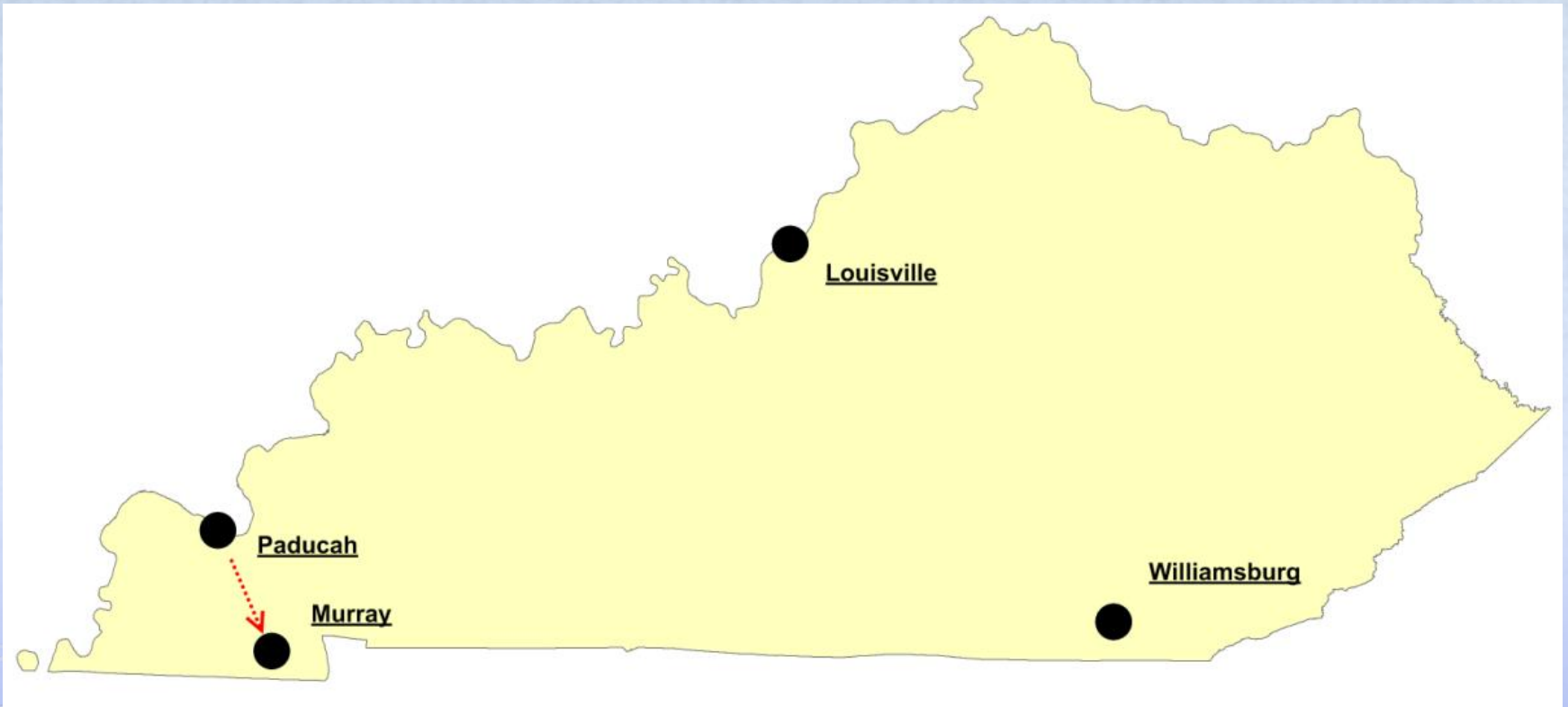


KY WSC

Computer Resources Overview

ITAC Visit – October 6-9, 2009

Geographic Overview



The Personnel

- Support 41 full- and part-time staff
 - Shared Director (from IN WSC)
 - Shared AO (to MI WSC)
 - Studies section ~ 10 personnel
 - Data section ~ 17 personnel
 - Sediment Lab ~ 4 personnel (3 students)
 - Administrative section ~ 4 personnel (2 students)
 - IT section ~ 2 personnel

“Extraordinary” personnel and operations

- ❑ Bruce Bauch – GIO [Mapping liaison]
- ❑ Dave Mueller – OSW [Hydro Acoustics]
- ❑ Clyde Sholar – Mid West Area Safety Officer
- ❑ Bonnie Fink – EPN
- ❑ Charles Allen – Vision impaired
- ❑ Sediment Lab – Service 27 USGS WSCs and 9 private entities

Computer Resources – End User

▣ Desktops ~ 36

- Range from 2.0GHz to 3.4 GHz. 1GB Ram is standard; several have been upgraded to 2GB or 4GB.

▣ Notebooks ~ 38

- Range from 1.0 GHz to 2.67 GHz. 1GB Ram is standard; several equipped with 2GB.

Computer Resources – End User

- Most project chiefs use a desktop PC. A couple of project chiefs use a notebook with docking station as their primary desktop. Those who use a desktop computer as their primary computer also have a notebook computer.
- Technicians use notebook computers as their primary desktops and are equipped with a docking station and 19" FPD for dual-display capability when working records.

Computer Resources - Infrastructure

- UNIX-based
 - NWIS server
 - LRGS
 - Internal web server
- Miscellaneous
 - NAS device
 - Tape library
- Windows-based:
 - EAD Domain Controller
 - 1 Applications server
 - WTS server
 - 5 Member servers
 - 3 in District Office
 - DHCP, SAV console, BelArc
 - BelManage, UltraBac, {SUS and PRISM Deploy},
 - 1 in each field office
 - DHCP, SW share, backup host
 - 2 Work stations
 - Ghost Console
 - Software share
 - Telephone Console

NWIS Server

■ Sun Fire V445

- 4-1.6GHz UltraSPARC III CPUs; 8 GB RAM
- ~410 GB of Disk space
- AIT-2, DDS-3 tape drives for backups
- Single authorized host for “sensitive information” (NWIS data/operations and Administrative and/or Personnel data/operations)

Internal Web Server

- ❑ Sun Ultra V
 - 256 MB RAM
 - 20 GB HD
 - DDS-3 tape drive for backups
 - Have additional Ultra V (swappable host/parts)
 - Only KY-WSC IT personnel have logon capability as users

LRGS

- ❑ Gateway E4200 – RedHat Linux
- ❑ System is approximately 15 years old – PC replaced in 2000

NetApp FAS270 NAS

- ❑ ~2.2 TB capacity (pushing the limit now).
- ❑ Proprietary OS – Data OnTap 7.1
- ❑ Utilized as Windows-based disk storage.
\$USER area (including a small software share), project area, and GIS library/work area
- ❑ Snapshots are taken three times a day and held for approximately 30 days

Overland Storage Tape Library

- ❑ 29 tape capacity
- ❑ Single LTO-2 drive. Two slots for drives – only one slot currently used
- ❑ UltraBac is used to backup the Windows-based computers and NAS

Windows Servers and Workstations

- Member servers are Dell OptiPlex computers [DHCP, Symantec AntiVirus console, BelArc BelManage console, UltraBac console, {Prism console}, Ghost Console, software sharepoint]
- WTS server is a PowerEdge 4600 (RAID 5) and hosts specialty software for users (Adobe Acrobat Pro, Illustrator, Indesign, and FrameMaker; Corel Draw, Velox graphing software)

Printers / Plotters

- ❑ District office is equipped with:
 - three color inkjet plotters (two large format [42" and 36"] and one letter/tabloid format)
 - Two color laser printers (one handles duplex)
 - Several monochrome laser printers (two handle duplex – including the large photocopier)
- ❑ Each field office is equipped with:
 - One large and one small format inkjet plotters and one monochrome laser printer
- ❑ Each office has a color copier/scanner/fax machine

Local Area Network

- ❑ Gigabit-switched network
- ❑ Two Extreme Networks Summit X450e (48-port) switches. A third X450e is on hand as a swappable spare.
- ❑ Summit switches provide POE for telephone connectivity.
- ❑ Two VLANs are in use – one for voice and one for data
- ❑ Ancillary switches and hubs are utilized for some second-tier devices (user-area desktops and some printers)
- ❑ Premise wiring is Cat-5

Telephone System

- ❑ Avaya G450 VOIP system installed 10/2008
- ❑ Console run on Dell 2300 Power Edge server
- ❑ Voice travels over separate VLAN. The console is connected to data network only for upgrades and imaging
- ❑ Phones contain 1GB network modules for computer connectivity through them

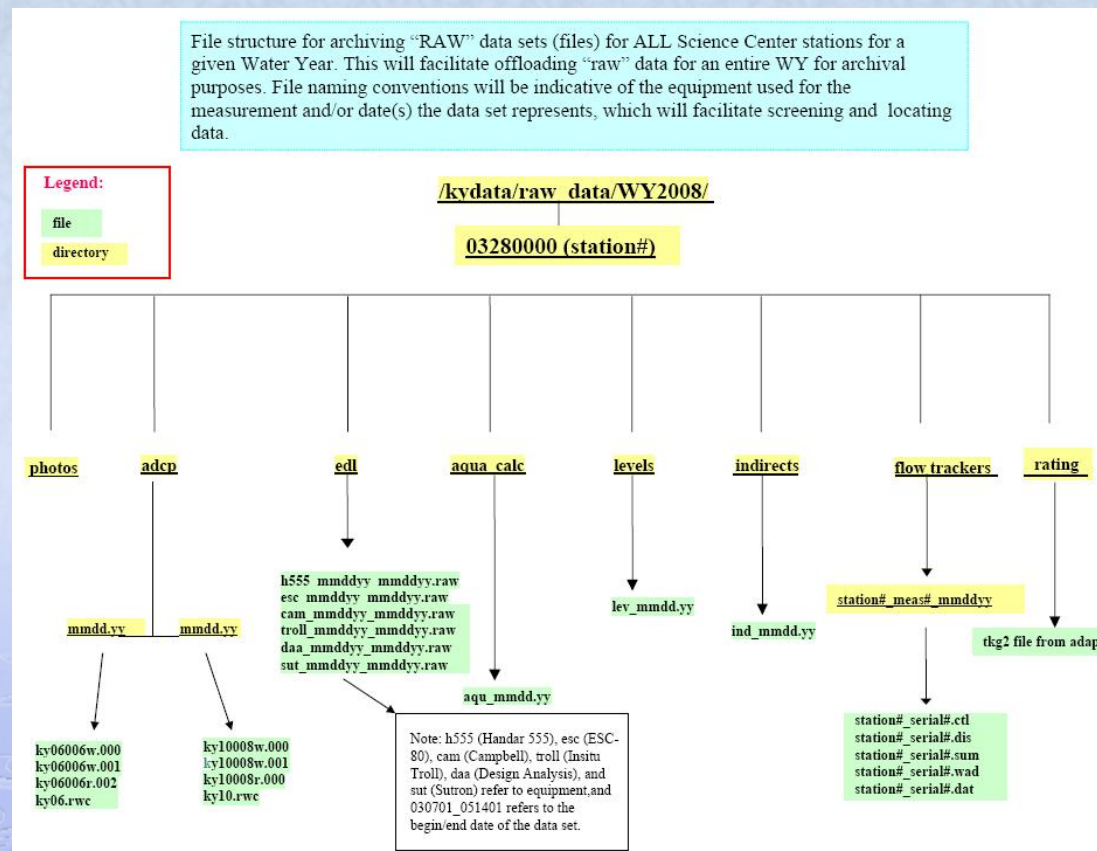
IT Operations – Data Organization

■ NWIS server

- /home area for users' files, the “admin” and “personnel” directories.
- /kyarchive area for on-line archives of NWIS UV data, NWIS data (EDL backup, Flow-tracker, ADCP, databook station descriptions and analyses, photos, etc. from previous water years).
- /kydata area for NWIS data being collected for the current WY. Scripts have been created to automate the creation (management and migration of specific files within the previous WY) of a new WY-data container.

IT Operations – Data Organization

■ NWIS server – raw_data storage area



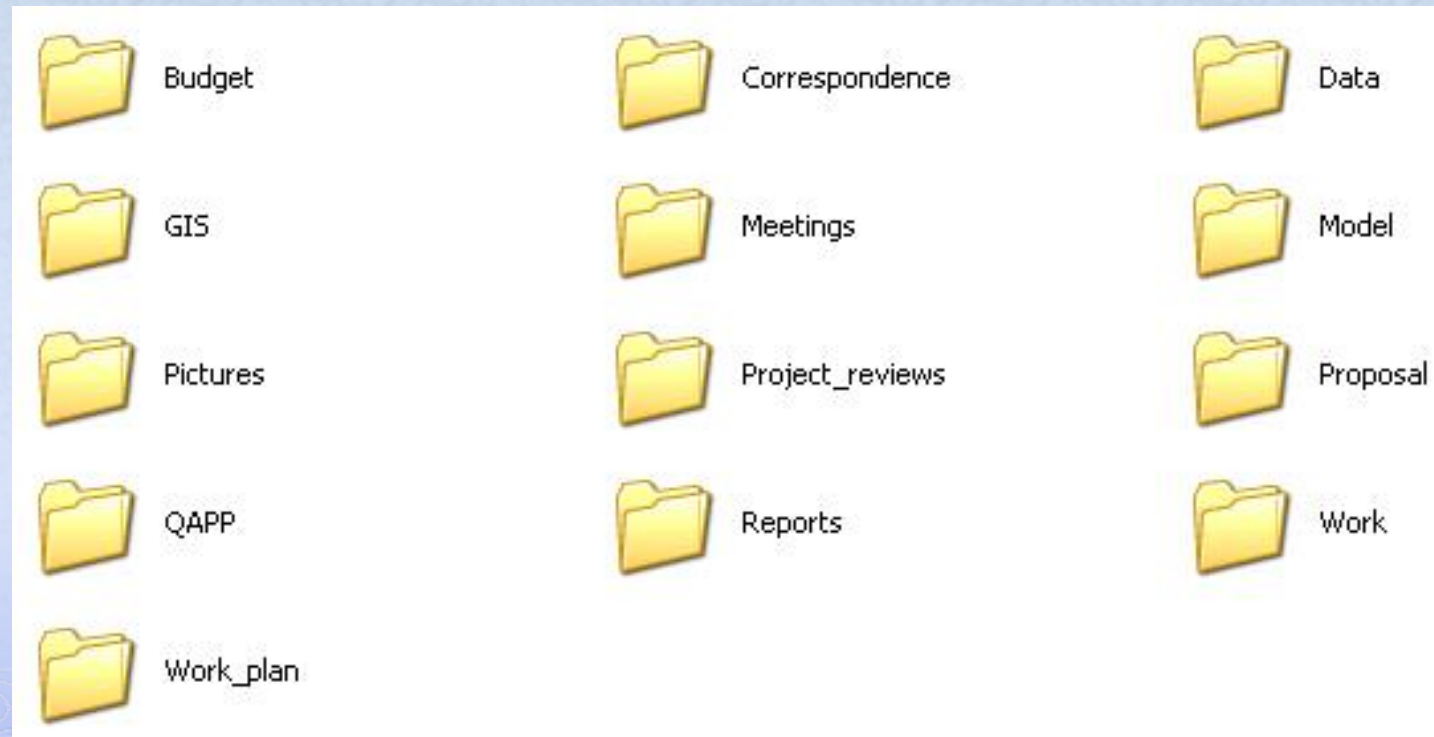
IT Operations – Data Organization

■ NAS

- \kyhome area for users' files and a small software partition
- \kygis area for the WSC's GIS library and work areas for "heavy" GIS users
- \kyproj area for WSC's current projects.
"Authoritative" storage area for all project work. A standard project-folder template has been developed and is established for each project; that simplifies and simplifies project archival tasks

IT Operations – Data Organization

■ NAS – cont'd. Project Folder template:



IT Operations – Backups/Recovery

■ UNIX systems

- NWIS server: Full backups of OS/dynamic file systems are performed on Tuesdays and Fridays; incrementals are performed on Mondays, Wednesdays, and Thursdays.
- /kyarchive is backed up to tape as modified – generally after the hydrologic data have been worked and approved for the previous WY. This includes the collected hydrologic data (and supporting information) maintained in the “raw_data” area for that WY, as well as the finalized UV data maintained in ADAPs .
- A recovery OS disk (containing root, usr, and usr_opt) is created quarterly after the patch cluster is installed.
- Internal web server: Full backups are performed on the 1st and 15th of each month.

IT Operations – Backups/Recovery

■ Windows systems

- NAS utilizes snapshots (online backups) 3 times daily. Dynamic areas are backed up to tape via the tape library over the weekends. Static areas are backed up to tape via the tape library as quarterly archives.
- Desktop PCs (Documents & Settings, Lotus_Notes_Data, C:\USERS, “known” data areas, and system-state information) are backed up to tape via the tape library weekly.
- Field notebook computers are not backed up to tape. A GPO-based logoff script permits users to backup \$USER-related files/information to their \$HOME space on the NAS (or member server in the field offices).

IT Operations – Backups/Recovery

□ Backup tape handling

- Backup tapes are rotated off site approximately every four weeks. Transportation log is maintained.
- Backup tapes are tested/verified monthly.
- Backup tapes containing sensitive information are labeled as such by the scripts that perform the backups.

IT Operations – Security

- ❑ UNIX hosts are patched as required. Patch clusters are generally installed within 1-2 weeks of release.
- ❑ Windows hosts are patched automatically and monitored through BelArc BelManage on a weekly basis.
- ❑ A Symantec AV server/console is maintained within the WSC. All Windows-based hosts are clients and are running 10.1.8.8000. Will be migrating to eSAV per USGS requirements.
- ❑ There are a total of four PR accounts issued within the WSC.

IT Operations –Deployment

- ❑ Systems are generally purchased in lots. One is built and configured (operating system and most applications except ArcGIS and “specialty” software) and then imaged to the rest using Symantec Ghost.
- ❑ Generally try to replace computers in 3-5 year cycles.
- ❑ Software is deployed via GPO (PRISM is being incorporated). Some software is still installed manually via a network share.

IT Operations –User Support

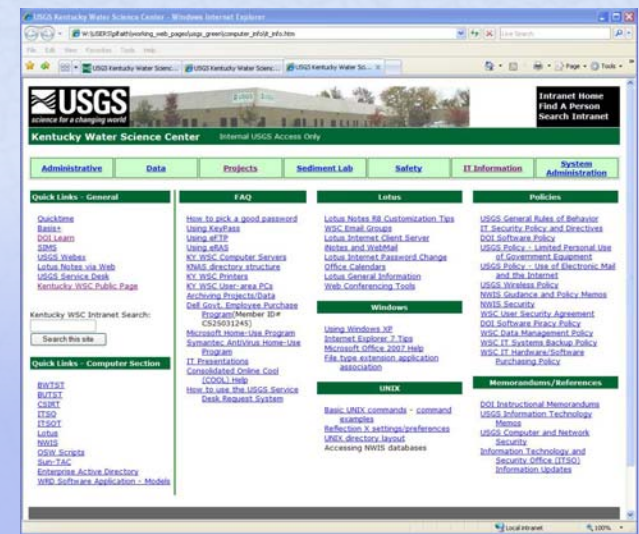
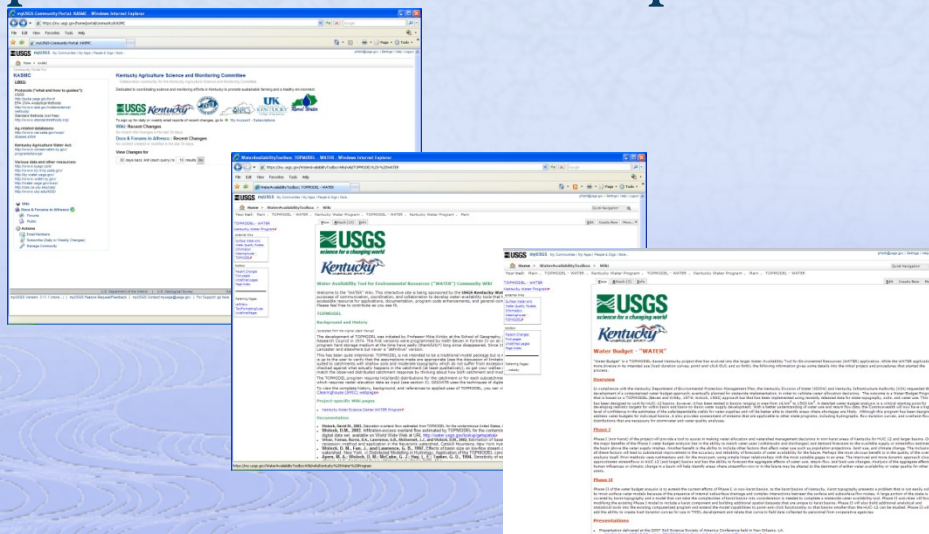
- Believe we do a pretty good job providing support to our users here in the KY WSC.
 - Try to be responsive and timely to users' needs.
 - Some requests have proven to be challenging: Data-rescue project interfacing a 25+ year-old tape reader, resolving data retrieval issues from the ADCPs and Handar equipment when interfacing the new duo-core field notebooks a couple of years ago, and retrieving the Lichty data (2005) from 9-track tapes created using PRIME MagSav.
 - And of course, every office has a user that tends to keep things lively...

IT Operations –User Support



IT Operations –User Support

- The workload varies - “behind-the-scenes” systems administration; resolving computer issues; processing or manipulating data; creating and maintaining web-pages, and automating work processes to make operations more efficient.



IT Operations – Capabilities

- Have become more complicated.
 - DOI IT doctrine doesn't exactly facilitate an environment that promotes the “friendly exchange and pursuit of science” ...
 - We do our best to adhere to DOI and USGS rules and guidelines; and provide personnel with the tools and approaches to sell their projects and accomplish their tasks.

IT Issues

- ❑ Similar to others you have already encountered:
 - Slow networks
 - Users unhappy with security and operational restrictions that have been implemented.
 - Concerns regarding centralization (lost or diminished capabilities.)

IT Issues

- ❑ Budgetary issues and funding concerns. The last two years have been difficult years for the KY WSC. IT expenditures have been cut significantly. Several computing devices considered critical to the KY WSC IT operation are not covered under a maintenance contract.
- ❑ Purchasing IT consumables has been stretched to its limits.
- ❑ Questions surround the KY WSC's future as to what its role will be – remain a science center or become a sub-district or field office.



Questions???