GIS Technology and Data Management - Partners or Foes?

More Issues for Database Managers and GIS Analysts

Pontification by: Jason Duke, USFWS

Organization of Fish and Wildlife Information Managers
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“After analyzing all your data, I think we can safely say that none of it is useful.”
“I’m Big Data, and this is my friend No Privacy.”
“It’s amazing how we’ve transformed the industry as a result of my typo.”
ARE YOU SURE THIS IS HOW WE GET DATA INTO THE CLOUD?
BIG DATA IS GOING TO IMPACT US SOON!

CALL BRUCE WILLIS!!
Background with Data

- BS in Management Information Systems and MBA in Information Systems from Tennessee Tech
- Southeastern School of Banking at Vanderbilt
- Certified Information Systems Auditor (CISA)
- Certified Information Security Manager (CISM)
- Certified Risk & Information Systems Controls (CRISC)
- Cybersecurity (CSX) Practitioner
- CompTIA A+, Network+, Microsoft Certified Professional
- GIS Professional (GISP)
- Blah, blah, blah
FWS Data Experience

• Created OALS system for FWS ES Offices in 1994 that is now the TAILS system in ECOS
  • Used in all 83 ES Offices of USFWS
• 27 years with DOI (3 USGS, 24 USFWS)
• Daily GIS user since 1990
• Dual IT/GIS role
• RO Employee in the Field
• GIS folks are “catch all” – IT, Copiers, Printers
State of Data

• Many terabytes of data are lost forever on obsolete and damaged media
  • 8” floppies, WordPerfect (reveal codes), FoxPro, dBase III, FoxBase, WordStar, Lotus 1-2-3, cc:Mail and Lotus Notes
  • DOS, Windows 3.1 for Workgroups, Novell NetWare, LANTastic
  • Old hard drives… Drill baby, drill…..
  • What do I do with these Core tapes and the 8mm things, Zip disks, mad that I can’t use CD/DVD anymore
  • Oh dear, I’ve lost my USB drive again… did I encrypt it? What?
Where Do Lonely Data Go?

- Data are still “lost” today
  - Slow Internet connections require isolated servers
  - Lack of qualified “database” designers hinders us – they move on
  - Orphaned systems on obsolete platforms cripple us
    - FileMaker Pro Version 6 (2002) flat files, Quattro Pro
  - Cradle to Grave data services – people work most of a career in one platform – change is “bad”
- Lack of central storage
- Folks use what makes their jobs easier, not what you force them to…. Don’t take my FMP away!
Why So Sad?

• We keep losing staff and can’t maintain our databases
• Encryption, LUA, Patch Wednesday, Passwords!
• Servers to Desktops to Laptops to Tablets to Phones to *Poof*
• Systems are designed further away from the “field”
• Can we use the Cloud or is it prohibited?
• My old software will not run in Windows 7 or 10 and I cannot read my old media
• What about that web cam?
Where Can I Store Data?

- Servers
- Desktops
- Portable Hard Drives
- USB Drives
- SD Cards, CompactFlash, MicroSD, Memory Stick
- CD, DVD (+ and -), Blu-Ray
- Floppies (3 sizes), 8 mm, 9-Track, Zip Disc, Mini-Disc
- Cloud (Google, OneDrive, Dropbox, Box, etc.)
Data Formats

- Excel (.xls or .xlsx) or Quattro Pro or Lotus 123
- Access
- dBase (.dbf)
- SQL, Informix, Sybase, DB2, PostGres, MySQL, Oracle
- Comma-delimited text .CSV or .TXT
- Coverage, Shapefile, Geodatabase
  - Personal, File, Workgroup, Desktop, Enterprise
GPS Conundrum

- Trimble with Base Station
- Rockwell PLGR (Selective Availability)
- Trimble PathFinder Pro
- Garmin or Magellan Handheld
- GPS Tracker evolution – now smaller than a quarter
- Cell Phone – from triangulation to GPS
- Mobile Device with external antenna (Bad Elf, Garmin GLO)
Mobile Data Collection

- ArcPad
- ArcExplorer and ArcPublisher
- ArcMobile
- ArcGIS Online and Portal
- Collector with AGOL
- Survey 123 integrated with Collector
- Cell Phone/Tablet Photos and Storage
- Open Source Apps
Aerial Imagery Collection

- Old aerial photos to scan
- First DOQQs – late 1990’s
- DOQQs, Landsat, Spot, IRS, IKONOS, WorldView
- UAS (“Drone”) Data Collections
  - Photos
  - Remotely sensed data
Data for Disaster Response

- Hurricanes
- Oil Spills
- Tornadoes
- Floods
- Wildfire
- Terrorism
- Incident Management
- Law Enforcement
You Want to Feel the Love

- GIS folks make an enormous contribution to the mission of their agencies
- We are seen as button pushers to make maps, but we analyze and troubleshoot in detail
- Lots of frustration, system crashes, data loss and heartache
- But.... We just want to feel the love and provide products that help conserve and manage wildlife
History of ArcGIS

1969 → 1982 → 1989
Arc/INFO (Unix) → PC Arc/INFO (DOS + Windows)
Jack Dangermond founds ESRI

1992
ArcView + Arc/INFO

1999
ArcGIS v.8.0 → ArcGIS v.9.0
(to v8.3) → 2004
ArcGIS v.9.3

2002
ArcView 3.3 “retired product”

2008 → 2010
ArcGIS v.10.0
The Good Old Days
Of GIS
The Early 1990’s
Legacy Formats

- ArcInfo Coverages:

  - Topology:
    - Build command
    - Clean command

  Model for the Geodatabase Feature Dataset
Line Edits Don't Take. If You Take No more Maps For You.
Oil Spill Data Battle - Arrested?

- Wildlife data became a valuable commodity during the 2010 spill
- Battle between State and Federal sources
- Who was in control? Conflicting guidance
LOUISIANA department of public safety & corrections

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mission statement
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Contact Info

Jason Duke
Southeast Region GIS Coordinator
US Fish & Wildlife Service
446 Neal Street
Cookeville, TN 38501

jason_duke@fws.gov
931-252-0338  Cell
931-525-4986  Office