

Using Electronic Field Forms for State Monitoring Programs



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Outline

- Brief outline of ambient monitoring program (BURP)
- History of Data Collection
- Hardware and Software selection
- Results
- Lessons and Advice
- Questions

Beneficial Use Reconnaissance Program (BURP) overview

- Primary ambient monitoring program since 1993
- Wadeable streams
- Monitoring conducted out of 6 regional offices, three-person temporary field crews
- Data for three indicators of Cold Water Aquatic Life: macroinvertebrates, fish, and habitat
- >200 data points collected at each site

BURP Overview

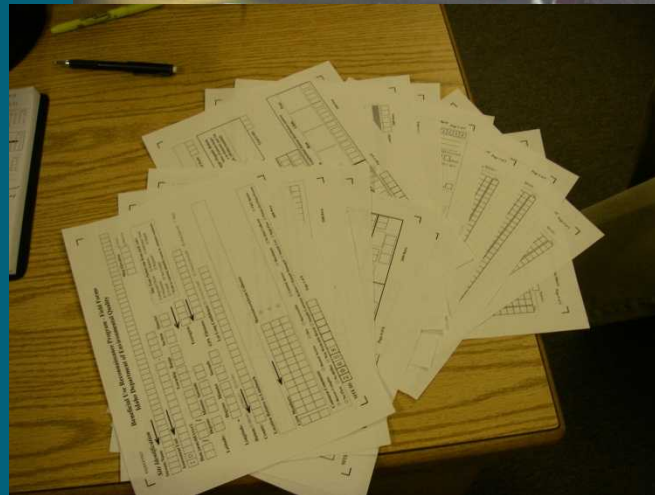
- 2-4 hours per site
- 40-100 sites per region, 240-600 sites per year, statewide
- Adverse conditions, remote locations



History of Data Collection

- 1993-2003: Standardized field forms, data were hand entered into Access database
- 2003-2008: Teleforms, shipped to State Office at end of season, scanned into SQL Database

- Waste: all that paper!
- Time: up to a year or longer for all data to be reconciled, corrected, and entered into the database



- Quality: illegible, missed fields, data out of range
- Money: paper and printing costs, license agreement, personnel



Hardware Considerations

- Hardware requirements:
 - Windows based
 - Multiple uses
 - Battery life
 - Peripherals
 - Tablet style
 - Portable
 - Screen size
 - Field worthy





Hardware Selection

- Rugged field computers:
 - GETAC E100



Software Considerations

- Software requirements
 - Familiar
 - Stable
 - Cheap
 - Error checking and seamless transfer to database

Software Selection

- 2010- Piloted use of electronic field forms- state office crew, 48 sites statewide
 - MS Excel / VBA Forms, Separate Excel Files
- 2011- full fledged transition statewide- 6 regional offices, 234 sites statewide
 - MS Access / VBA Forms, Access DB on individual machines, transferred remotely into Central Database

Results

- Waste- 3,000-6,000 pages
- Time- From 9-12 months to instantaneous
- Quality- error checking will ensure all fields are complete, and within range
 - Field calculate reach, averages, flow, etc.
 - Data audit report

Results

Paper Teleforms	Startup Cost	Annual Cost	5-year Total
Data Entry Clerk, 1.0 FTE		\$80,000	\$400,000
Teleform support, 0.15 FTE		\$12,000	\$60,000
Teleform software license		\$1,200	\$6,000
Total		\$93,200	\$466,000
Electronic Forms	Startup Cost	Annual Cost	5-year Total
New Hardware and accessories	\$32,000		\$32,000
Hardware- maintenance		\$5,000	\$25,000
Form development, O & M, 0.1 FTE	\$8,000	\$8,000	\$48,000
Form development, contractor support	\$4,200	\$2,000	\$14,200
Total	\$44,200	\$15,000	\$119,200
Total Savings		Annual	5-year Total
		\$78,200	\$346,800
		84%	74%

Lessons and Advice

- Work with Database administrators and end users
- Mimic existing forms
- Error checking
- Identify early adopters and skeptics
- Test
- Sell

Questions?

